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THE ULSTER MEDICAL JOURNAL

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THE ULSTER MEDICAL JOURNAL

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THE ULSTER MEDICAL SOCIETY

P.O. Box 222,
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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 descendent 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 and 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 Act shall be eligible for election as members of the Society (Constitution, Section VI). Temporary membership may be allowed at the discretion of the Council.

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

.....19.....

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THE
ULSTER MEDICAL JOURNAL

PUBLISHED ON BEHALF OF THE ULSTER MEDICAL SOCIETY

VOLUME 48 1979 No. 1

ON THE MOVE

by

MILLAR BELL
Consultant Surgeon, Belfast City Hospital

PRESIDENTIAL ADDRESS TO ULSTER MEDICAL SOCIETY SESSION 1978-79

A PREDECESSOR, Mr. David Craig, in his Presidential Address five years ago, traced the development of the City Hospital from its beginning in 1838 for a period of over 60 years. It is my intention to continue from here to the present time, a period of about 80 years. In the course of this I shall refer in some detail to three past members of the Medical Staff, the development of undergraduate and post-graduate teaching, and finally the new hospital.

Our first surgeon was a Dr. Lynas who had come from the Belfast Hospital for Sick Children, where he had been on the surgical staff. He transferred to the City Hospital in 1900, and died suddenly in 1905 aged 40, and was succeeded by Dr. Joe Fulton who had been his assistant.

Initially I would like to consider some aspects of the buildings, and their changing functions over the years. At first we had the Workhouse, its Infirmary (Union) and the Fever Hospital, later known as Gardner Robb House. The complex was run by a Board of Guardians responsible to the Poor Law Commissioners in Dublin up to 1920. They were faced with the demand for more hospital accommodation in 1862 as a result of the Poor Law Relief Act, which permitted poor as distinct from destitute persons to be admitted. The school building for the Workhouse, had accommodated 1,300 boys, and this was converted to a hospital, and extended in 1900 by the addition of two wings, which are now basically the medical and surgical wards.

In 1874 another building was added to replace the original school building. It continued as such until 1926, when it was renovated and became known as the Windsor Hospital for long-stay mental patients (imbeciles and epileptics). In 1960 it was again redesigned at considerable cost (£120,000, having originally

been built at a cost of £10,940). The redesigned building was named Windsor House, and became the first University Department of Mental Health, with Professor John Gibson in charge, who is regrettably no longer with us. It is nice to be able to report that the Gibson Memorial Library was opened by Mrs. Gibson in June this year. Close to Windsor House another building was provided to accommodate convalescent patients from the wards, known as the Convalescent Hospital, and was used as such until 1948, when it became necessary to provide accommodation for geriatric patients. At this time Dr. George Adams, later Honorary Professor, was appointed, and from this time there developed one of the best geriatric units in the United Kingdom. Ten years later it proved inadequate for the needs of the service, and in 1958 a new wing was added to the front of the old building at a cost of£200,000, and opened by Lady Wakehurst in 1958 – Wakehurst House. Dr. Adams was greatly supported in the early days by that pioneer of geriatric medicine, the late Dr. Marjorie Warren, and in Wakehurst House we have the Marjorie Warren Ward. The needs were clearly defined by a young social worker, Miss Miriam Sargaison, who did quite remarkable research work, going out into the community to lodging houses, hostels, etc., and her book on the subject is well known – 'Growing Old in Common Lodgings'.

Some of the old Convalescent Hospital remained, and in 1961 was upgraded to provide more accommodation for dertamology, a service started in 1940 by Dr. Reginald Hall. The original maternity unit was known as Ivy Cottage, having been built in 1893. In 1906 the old Fever Hospital patients were transferred to the new Purdysburn Fever Hospital, and the vacated building was transformed into a maternity unit known as Gardner Robb House. In 1935 further accommodation was provided for obstetrics and gynaecology, which I will refer to later.

Separate accommodation for sick children was built in 1908, and extended in 1932, the combined building being known as the Dufferin and Ava Hospital currently providing accommodation for sick children and the ophthalmic and ENT departments.

In 1924 a new building was provided known as the Abercorn Hospital, the foundation stone of which was laid by the Duchess of Abercorn, and it was opened by Lady Craig, wife of the Prime Minister Sir James Craig. It had 80 beds on two floors, those on the ground floor being for observation, and on the first floor for cancer patients. This was the first accommodation in Northern Ireland to be provided specifically for cancer patients. It is interesting to note that some of the beds cost £1.15.3, and some slightly better cost £1.17.6, in contrast to a modern hospital bed which costs between £200 and £300. Like most of the other buildings in the hospital the function of the Abercorn Hospital has been changed, the top floor is now an acute medical unit, having been developed as such by Professors Wade and Elmes. The ground floor accommodates a very modern extension of the X-ray Department.

It would be impossible to go into all the details of change here, but virtually every ward has been modified and upgraded as far as thick walls, high ceilings and central steel pillars will allow. Previously anything up to 80 patients were accommodated in a ward, and now there are at most 30 patients per ward.

On the ground floor was the Doctors' Parlour, where the Visiting Medical Staff were able to meet, exchange views and have informal discussion about their clinical problems and the needs of the hospital. There were, of course, only 8-10 of them, whereas now there are about 90 of us, so this room would be quite inadequate, and in any case it was lost to the Dental Department. In it was kept an attendance book – an enormous ledger which had to be signed on Sunday mornings. Most members were totally allergic to it, and I understand that when Mr. McClure arrived he sent for the book, and it has never been seen again! The Doctors' Parlour has not been replaced, but we do meet every Wednesday for lunch in a very pleasant function room – The McKee Room – so named after one of our matrons.

X-RAY DEPARTMENT

Up to 1923 the hospital had functioned without the aid of an X-ray department or laboratory, although there is a reference in 1900 that X-rays had been successfully supplied on several occasions by Messrs. Clarke & Co., to determine the nature of fractures, and on at least one occasion to determine the exact location of a bullet. In October, 1923, it was decided that we must have an X-ray department, as no hospital with any pretension to being up-to-date was now without this. The cost of preparing a room was estimated at £354, and the cost of the X-ray apparatus £600. An X-ray specialist was employed at the same salary as the opthalmic surgeon, because X-ray work was a very dangerous occupation requiring a trained and skilled operator. The salary was £2.10.0 per attendance, three times per week. The first radiologist was Dr. Maitland Beath, who came in February, 1929, to whom an assistant was appointed in December – a Mr. Sparrow.

The first X-ray machine apparently gave good service but was somewhat horrific in that when it was switched on sparks flew out in all directions. It is surprising that patients did not actually disappear rather than submit themselves to such an apparent ordeal. Soon after his appointment Dr. Beath recommended that the X-ray department be upgraded by the installation of a new machine costing £1,365.15.11 (Victor). He informed the Guardians that with this installation they would have the best-equipped department in the Province, if not in Ireland – needless to say it was approved. About the same time new X-ray equipment was supplied in Dufferin and Ava, costing £608.10.0, and a portable machine costing £159.10.0. From this modest beginning the X-ray department has gradually developed, especially in the past decade and much more space has been acquired in the Main Hospital, Abercorn and the Cardio-Vascular Unit. The most recent installations have been the equipment necessary for ultrasonic investigation and isotope scanning, complete with computer attachment. There are five radiologists in post.

PATHOLOGY LABORATORY

You will recall that insulin had been introduced for the treatment of diabetes in 1922. The following year the Visiting Medical Staff told the Guardians that

insulin could not be used, except dangerously, in their hospital without laboratory supervision. It was not until 1928, however, that the Bacteriology Laboratory was opened, the equipment costing approximately £100, and the salary of the bacteriologist to be the same as the ophthalmic surgeon. Dr. Lewis was the bacteriologist, and had as his technician a Mr. George McKee, to whom I am indebted for some details. For ten years there were just the two of them, and one room provided accommodation for Bacteriology, Bio-chemistry, Haematology and Histopathology. They had the help of three workhouse inmates – one in the animal house, one washing glassware, one keeping the place clean and the copper water-baths polished. His outstanding memory of Dr. Lewis is of a man of great charm, who worked long hours, and took very few holidays. Later it was imperative to get more laboratory accommodation and establish a pathology service as such. For this an old workhouse building, known as Kerr's Buildings, was prepared. It had been used in World War I by the R.U.C., and in World War II by the American Army as a temporary hospital. It is staggering to think that the laboratory staff are still obliged to work in this ancient building, which is totally inadequate for the needs of the service, not to mention the training of junior staff.

The Commissioners approached the University Department of Pathology, and had a sympathetic reply from Professor Biggart. Informal discussions were held on 17th March, 1942, and by July of that year approval had been obtained from the Ministry of Home Affairs. An honorarium was to be paid to the Professor of Pathology of £150 per year, and £250 to his Assistant. It is a matter of some importance to mention that the Assistant was none other than Doctor, now Professor John Edgar Morison. Later he left the University Department of Pathology to go to the Public Health Laboratory Service when this was transferred to the City Hospital in 1954, and he joined the staff of the City Hospital in 1957. No one would think of questioning our good fortune, and I must publicly pay tribute to him for his invaluable service to the City Hospital and indeed the province.

MEDICAL STAFF

One of the continuing problems over the years was a shortage of staff. In 1937 Mr. H. P. Hall (Fig. 1) sent a heart-rending letter to the Guardians requesting the appointment of an additional house surgeon. The one he had at the time was shared with his colleague Mr. Hanna for whom he had to look after 600 patients in addition to Mr. Hall's acutely ill patients. He was neither available or able to give the necessary care and attention to the surgical cases. The British Medical Association met in Belfast that year, during which Mr. Hall provided a surgical demonstration, to which he invited the Guardians so that they might be stimulated by seeing some of the work going on in their hospital – the additional house surgeon was appointed. Later he requested the appointment of an assistant visiting medical officer, and in due course Mr. Eric McMechan was appointed.

The house surgeons did not have an easy time with large numbers of patients to look after, and strict discipline. They had to get permission to leave the hospital, and had to be back by 11.00 p.m. Their accommodation left much to be desired. Under these circumstances perhaps it is not surprising their behaviour did not always meet with approval. On one occasion they were threatened with dismissal because of some misdemeanour, and were only allowed to stay when they agreed to pay £5 to charity. The Samaritan Hospital Free Funds benefitted Nevertheless, they had a rather nice practice that when leaving they wrote to the Guardians, thanking them for the valuable experience and training they had had in their hospital.

This brings us up to 1939 when World War II was upon us. An emergency plan was formulated under the direction of the emergency officer for Northern Ireland, Dr. F. M. B. Allen. The City Hospital was designated a casualty reception centre and the Samaritan Hospital a first aid centre. In 1943 plans were made for post-graduate training for demobilised medical officers with the suggestion that the Belfast hospitals should take 40 every six months. I could not help noticing that Mr. H. W. Gallagher and Mr. T. Smylie were among the first to come to the City Hospital, and at a slightly later stage Mr. Sinclair Irwin. These gentlemen are now retired but they were destined for very successful and prominent surgical careers, having had such a good beginning.

New appointments of highly qualified and trained physicians and surgeons were made, and in 1947 Dr. A. P. Grant was appointed specialist physician at the remarkable salary of £1,000 per year – this is the first record I have of a member of staff at the four-figure level. Dr. Grant has gone from strength to strength, and as many of you are aware he is currently President of the Royal College of Physicians of Ireland, being the first Northern Ireland doctor to hold this office in a College over 300 years old.

Our first anaesthetists were appointed in 1948, Dr. Dornan, Dr. Keir and Dr. Harold Jefferson at a salary of £800 per year. In retrospect it is remarkable that we didn't have trained anaesthetists at an earlier stage, and certainly it was a long cry from 1938 when Mr. Loughridge was doing a locum for Dr. Fulton, and found himself having to operate on two thyroid patients. He needed more skilful assistance than that provided by the house surgeon, and obtained permission to employ a specialist anaesthetist at a fee of three guineas per case – Dr. Stafford Geddis. Likewise in 1940 Mr. McFadden was permitted to employ Dr. Olive Anderson for the same fee.

SPECIAL DEPARTMENT

We find ourselves having to be on the move again to accommodate more special departments.

Accident and Emergency Department (Casualty) 1960

This large hospital had no casualty department up to 1960, and was not, therefore, properly equipped for the reception and treatment of emergencies (trauma, etc.). On their first day in 1960 they had three patients, but now they routinely have about 1,000 per week.

Cardio-Vascular Investigation Unit, 1966

Dr. E. Fletcher was responsible for this development. Wards in the old main hospital were modified to accommodate the unit. The Cardio-Vascular Investigation Unit was opened by Sir John Richardson in 1966. In this unit they have to date done over 400 coronary arteriographs, and something over 100 patients have been submitted to coronary artery surgery, which amounts to about two-thirds of the total. The unit has recently been re-equipped at the cost of £250,000. I hope you have all seen the excellent programme recently on television centred on the Coronary Care Unit.

Genito-urinary Unit, 1966

This unit was opened in 1966, and I must pay tribute to the late Mr. John Megaw, a former secretary of the Society. It was his foresight and persistence that led to its establishment, which is the only unit in the province devoted to the treatment of genito-urinary cases. It now has a staff of four consultants.

Renal Unit, 1968

This unit was opened in 1968 in new accommodation provided specifically for it. To date they have done about 130 kidney transplants, and I must tell you that their results are the best in Europe.

NAME OF THE HOSPITAL

The hospital was known for a long time as the Infirmary or Union, but in 1924 the then Chairman of the Board of Guardians proposed that the name be changed to the Belfast City Hospital. Nothing further was heard about this until October, 1941, when the Commissioners did change the name to the Belfast City Hospital, having considered calling it the Belfast General Hospital. This suggestion seems to have upset the Royal Victoria Hospital, as their then hon. secretary, Dr. John Morrow, promptly wrote to the Commissioners pointing out that this name would be inappropriate, as the Royal Victoria Hospital used to be known as the General Hospital. The Commissioners were not really impressed, replying that as the Royal was thus named by statute, they did not think their hospital being called the Belfast General Hospital could cause any problems. However, they did settle for the Belfast City Hospital.

COAT OF ARMS

In 1967 it was suggested that steps should be taken to establish a right to arms for the Belfast City Hospital, and in 1969 a sub-committee visited the College of Arms in London. Guided and advised by Clarenceux, King of Arms, a registered Coat of Arms has been obtained. Mr. Ryan, the then chairman of the South Belfast Hospitals' Management Committee, was asked to petition the Duke of Norfolk, Earl Marshal and Hereditary Marshal of England, for the granting and assigning of Armorial Bearings for the Belfast City Hospital, and Letters Patent were granted. With deference to the legendary Greek god of

medicine, the staff of Aesculapius design is used too frequently in medical institutions, and it was also thought that O'Neill's bloody hand could be given a rest. A glance at the final picture portrays the rising sun as a heraldic symbol looking to the future, appropriate to the building of our new hospital. The sea-horse indicates maritime locality and is common to the coat of arms of both Belfast and Queen's. The Irish elk (deer) is part of the heraldic achievement of Northern Ireland. The hospice indicates a refuge, a place of rest and tranquility, and happily flies a red cross. The wreath nestling on the helmet has, chapeau-like, on top a green mount simulating the grass of Ireland and therein grows a medicinal plant – the poppy, with an Irish wolfhound couchant. The motto 'In Dolore Solacium' was taken from the Latin version of the 'Twelve Caesars' by Suetonius, written about 60 A.D.

THE GUARDIANS

There were about forty of them comprising the Board, and they had up to fifteen sub-committees. Their task was indeed a difficult one, and they must be given great credit for running such a vast organisation for 100 years (1838-1939), especially as they had to work to a very tight budget.

There were problems and irregularities, also complaints about the Guardians, and at one stage (1936) they were described in the press as 'a bunch of comedians'. One of them could be seen walking around the streets of Belfast, from time to time, with his pet fox on a lead. In March, 1939, they were suspended and two Commissioners appointed in their place, a Mr. Henry Desmond, O.B.E., M.A., and a Dr. Llewellyn Drysdale Innis Graham, M.B., B.Ch., and subsequently a third, Dr. Edward Armstrong, M.D., B.Sc., D.P.H., in 1945.

The three Commissioners and their officers ran the hospital with greatly increased efficiency from March, 1939, to 29th September, 1948, when they had their last meeting. The Health Service began on 5th July, 1948, but the hospital was administered by a temporary committee to January, 1949, when the South Belfast Hospital Management Committee was appointed.

DR. JOSEPH FULTON

Dr. Joseph Fulton (Fig. 2) was one of a family of six, being brought up by his widowed mother on a farm near Doagh, and sent to medical school in Belfast, as was his brother James, who became a general practitioner for many years on the Woodvale Road. Another brother became a missionary in Manchuria where he spent 40 years, being remembered for his translation of the entire Bible into Chinese.

Dr. Fulton, or as he was commonly known 'Old Joe', was appointed to the Visiting Medical Staff on a temporary basis in 1905, and on a permanent basis in 1908. In addition to his hospital appointment he practised from his home on the Lisburn Road, in a house adjacent to the Majestic cinema. From his photograph (Fig. 2) he would seem to be a fairly determined character, and I am indebted to one of his old students, Mrs. McCreery Houston, mother of my colleague Dr. Ken Houston, for an appreciation of her former teacher. She

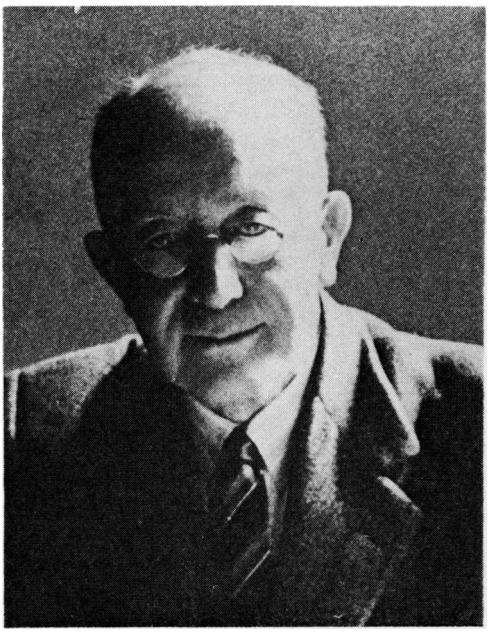
describes him as a forceful character who seemed to fill his white coat to distraction, and his presence and voice the whole ward. His comments, including prognosis, were made in a loud and clear voice that could be heard all over the Ward – 'Poor John, he's not long for this world'.

A nurse who trained in the hospital during his time also describes him as a forbidding character, but very popular, being known as the nurses' friend, and loved by them all. She remembers him as a rapid operator, who in abdominal surgery always used a long incision doing a thorough laparotomy, sometimes referred to affectionately as 'the ploughman'. He had very large hands and invariably wore gloves that seemed much too large for him.

Dr. Howard Crozier who was his house surgeon in 1922, in characteristic fashion, put it more explicitly – 'his theatre technique would have made the hair on the back of your head erect, but his results were very good on the whole'. He goes on to mention that he had an uncanny diagnostic instinct – a female patient was presented in the final examination as a case of breast tuberculoma. The Professor of Surgery and the Harley Street extern disagreed, and the unfortunate student was failed in his major case. Subsequently the pathology report confirmed Dr. Fulton's diagnosis. Dr. Walter Boyd told me of an instance when he had just come back full of knowledge, having attained his MRCP. In the ward was a patient with asthma, and after going into his history very carefully he discovered that amongst other things he was allergic to eggs. The old gentleman listened carefully and then said – 'Doctor you know that's interesting, because twenty years ago old Doctor Fulton gave me the same advice when I went to see him privately, and as I was walking down the Lisburn Road from his house, I was suddenly aware of a commotion behind me. On looking round I saw Dr. Fulton approaching rapidly, waving his arms and calling to me, remember – no eggs, no eggs'.

His working conditions left a lot to be desired, and in March 1913, he was compelled to write to the Guardians informing them that the operating theatre was quite unsuitable as it had cork carpeting, which was absorbent, soiled with pus, blood and other deleterious matter. It could not be properly cleaned and was, therefore, a source of infection in aseptic operations. He recommended a terazzo floor like they had in operating theatres in other places. One must recall that all his surgical work was done without a skilled anaesthetist, except perhaps for his last year or two. Many of us can vividly remember the trials and tribulations, particularly of abdominal surgery, before the days of modern anaesthesia.

In addition to his hospital work he did private surgical work, often going to the patient's home to operate on the proverbial kitchen or dining-room table. I only discovered recently that he was a great-uncle of Dr. Terence Fulton, although I must say I can not see the resemblance. He can recall being told of him coming out to operate in the home of one of his relatives. Although he was a strong supporter of his church, he not infrequently did these private operations on a Sunday morning.



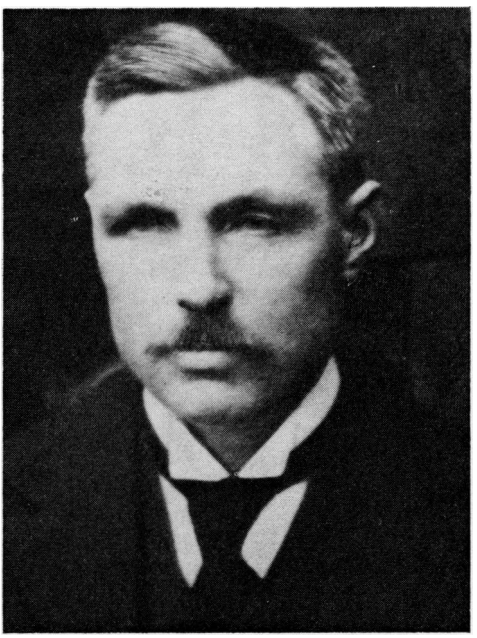


Fig. 1 (*Top Left*): Mr. H. P. Hall

Fig. 2 (*Top Right*): Dr. Joseph Fulton

Fig. 3 (*Bottom Left*):
Mr. George McFadden

When the Abercorn Hospital was opened in 1924, Dr. Fulton always started his ward rounds on the top floor, where the cancer patients were accommodated, proceeding to the ground floor to which emergencies were admitted. Many of these were cases of drunkenness. He had a strong dislike to alcohol and was quite impatient with those who were brought in, or came in, drunk, particularly if they had been brought in by the police. He repeatedly gave them a lecture on the impropriety of bringing such patients to hospital as it was the policeman's duty to look after them in the cells of the police station, rather than inflict such troublesome patients on nurses. If any of them were actually ill he alleged that if they could afford to get drunk, they could afford treatment at home. He addressed them as "drunken scoundrels", and if they could get on their feet at all they were ordered out. Such brusqueness at times led to a complaint, but Dr. Fulton replied in quite uncompromising terms, and nothing further was heard of the matter. It is not quite so simple nowadays with reports in duplicate.

Throughout his time on the staff his name appears on virtually every communication to the Guardians. Usually the medical staff members were agreed, but on one occasion there was obvious disagreement over the question of the need for an orthopaedic surgeon. Dr. Sam Armstrong wrote on behalf of the medical staff urging the Guardians to appoint one. Dr. Fulton likewise wrote in strong terms saying that there was no need for one. On this occasion he was over-ruled, an orthopaedic surgeon was appointed — Mr. H. P. Hall, a past President of this Society 1945 - 46, who started the first orthopaedic clinic in the hospital following a request from the Northern Ireland Council for Orthopaedic Development.

Dr. Fulton was a strong supporter of his church, Ulsterville Presbyterian Church, presenting them with a lovely organ in September, 1924 and this is still in use. I am grateful to the minister, the Rev. McKeown, for taking us into the church and allowing us to get some photographs. Perhaps you all know, but for those who do not, the Rev. McKeown is a brother of our Professor Florence McKeown.

Dr. Fulton carried on with his work in the infirmary until February, 1940, at which time he was forced to write to the Board submitting his resignation, by which time he was aged 76 years. In his letter he stated that he was suffering from incurable heart disease and nephritis, and was unable to continue his duties. He thanked the Commissioners and the former members of the Board of Guardians for many extra kindnesses that he had received during his long service. His resignation was accepted with a note that by that time he was the second oldest medical officer in the infirmary. He was granted an allowance of £397 per year. This was in February, 1940 and he died in April of that year.

Following his death the Commissioners received a letter of appreciation and sympathy from the Working Men's Committee of the Royal Victoria Hospital, signed by their honorary secretary, W. J. Lavery, who wrote to convey the Working Men's Committee's regret on the great loss the working classes suffered by the sudden death of their old doctor and friend Dr. Joseph Fulton, who was for many years a prominent medical and surgical figure in the Belfast Infirmary, and was very highly respected by all classes. They sympathised with the Com-

missioners and his other friends on their great loss. I believe this is the only time that such a letter of appreciation was received. In a very effective way it illustrates the high regard in which Dr. Fulton was held for the service he rendered to the community over a very long surgical lifetime.

MR. THOMAS S. HOLMES

Mr. Thomas S. Holmes was a farmer's son from Islandmagee, being one of three sons, all of whom became doctors. He and Dr. Howard Crozier were appointed to the medical staff of the City Hospital in June, 1926. They were both highly qualified, Mr. Holmes being M.Ch., F.R.C.S. (England) M.R.C.O.G., and Dr. Crozier being M.D., M.R.C.P., the latter having been a house officer in the City Hospital in 1922. (Rapid progress from house surgeon to senior staff in four years). Soon after their appointment a statement appeared in the British Medical Journal as follows:

> The Belfast Board of Guardians have taken another step in its progressive policy to which have been due in the past so many advances in the care of the large number of patients in its charge. At the Meeting of the Guardians held on the 15th June, 1926, two medical men were appointed. Mr. Holmes to be in charge of the Maternity & Gynaecological Department, and Dr. Howard Crozier to be Physician-in-charge of medical cases. The Profession in Northern Ireland will hasten to congratulate the Board on the wisdom of this further specialisation of the Visiting Medical Staff, which relieves the medical men of an intolerable burden, and at the same time enables them to give the patients more and skilled specialised treatment.

It seems that a common mode of entrée to the City Hospital was by doing a locum for a member of staff during his absence on holidays. Mr. Holmes had done such a locum for Mr. Hanna, visiting ophthalmologist, although I can not quite understand why an obstetrician and gynaecologist should be doing a locum for an ophthalmic surgeon. Later Mr. Price came, having done a locum for Mr. Holmes, as did Mr. McClure in 1942, joining the staff in 1945. I might mention that at that time the salary paid to the visiting obstetrician and gynaecologists was £500 per annum with a £100 per year war bonus.

Mr. Holmes had a far reaching and profound effect on the hospital, in that he was responsible for changing some fairly fixed attitudes, and breaking down barriers as between various groups of staff, for example, nursing and resident medical officers. By his personality and approach from day to day these barriers were gradually broken down and much more of a team and family spirit established. Soon after his appointment he became very concerned about the accommodation and facilities available for the practice of obstetrics and he was compelled to write to the Guardians, drawing their attention to this, requesting them to consider the provision of up-to-date accommodation. This received very favourable consideration, and by May, 1929, agreement in principle was reached to proceed with a new building. The necessary negotiations with the Ministry followed, and in September, 1933 a contract was awarded to F. B. McKee, Ltd.,

to build a new maternity and gynaecological hospital. The work to be completed in 18 months at a cost, including heating and lighting equipment, of £53,000. The building was formally opened by the Duchess of Abercorn on 31st May, 1935. The hospital, of course, is the Jubilee Maternity Hospital.

He went off on a period of annual leave in January, 1929 and visited various London hospitals, after which he reported to the Guardians that he had had a profitable time at various London hospitals for women. The most striking new work was in the use of radium for malignant disease, and he felt that there was no doubt that radium would entirely take the place of surgery in the treatment of cancer in this institution. He pointed out that it was very expensive, and the smallest amount that would be of any use would cost £1,500, but it should also be borne in mind that it did not depreciate in value, and was virtually everlasting.

This may seem a long way from the expertise and sophisticated equipment which is available today, with our University Department of Oncology and Belvoir Park Hospital (Montgomery House), but I feel that Mr. Holmes must be given great credit for the introduction of radium to the City Hospital back in 1929. I don't think any of us today take up our annual leave to go on hospital visits, but at that time it was quite common and, of course, at the expense of the individual concerned. There was no professional leave with full salary and a subsistence allowance.

During the same year also he found it necessary to ask the Board to appoint more nursing staff, his demand being modest, in that he simply asked for one additional charge nurse. This request was referred to one of the Board's Special Committees, and in due course was approved.

In 1936 the annual Congress of Obstetricians and Gynaecologists was held in Belfast, during which they visited Jubilee. Mr. Holmes was able to report that the visitors were most impressed with Jubilee, and some of them hoped to incorporate some of what they had seen in their new hospitals.

In 1938 he was compelled to write to the Board again pointing out the increasing work-load in the maternity department, indicating the inadequate number of medical staff in comparison with other hospitals of similar size, for example, the Royal Maternity Hospital, where at that time there were five visiting surgeons, five house surgeons and some anaesthetists. The Board proceeded to appoint two junior visiting medical officers, Mr. Price and a Dr. Carson, and increased the number of resident medical officers by four, in addition to the one already in post, and so Jubilee became established as a reasonably well staffed department.

In 1942 he and Mr. Price indicated their concern to the Commissioners over the problem of infant mortality, recommending that the time had come to appoint a paediatrician, as in their view such a person was the only one who could act efficiently to reduce infant mortality. Doctor, later Prof. F. M. B. Allen was appointed and fairly soon after this Dr. Muriel Frazer.

During all these years Mr. Holmes took a very active part in undergraduate teaching. His classes on a Saturday morning, as the final M.B. approached,

were very popular, but presented something of a dilemma for the students, because Mr. Hardy Greer also gave a lecture in gynaecology on a Saturday morning, and as I understand it there was not much love lost between these two gentlemen, nevertheless, both sessions were well attended.

He quickly built up a busy private practice and was much in demand throughout the Province. Many of you will know that he lost a son at an early stage during World War II, in the R.A.F. This tragedy had a profound effect on him, and indeed in many ways he never really recovered his zest and joviality. I would add that he was President of this Society for two years, 1939-40, 1940 - 41. He retired in 1949 and died in 1964.

MR. GEORGE McFADDEN, M.Ch., F.R.C.S.

The previous two gentlemen I have been speaking about were from a farming background. Mr. McFadden (Fig 3) is a son of the manse, coming from Newtownstewart, one of a large family, nine or ten. His formal education began at the local primary school, from thence to Inst., and then to Queen's.

He came onto the staff of the City Hospital in 1939, having been approached by the Commissioners, but was extremely hesitant, as he had never worked in this type of hospital before. Mr. Holmes finally persuaded him to accept their invitation, and he was on our staff until 1957 when he retired a few years short of the statutory retiring age of 65. He tells me that having been persuaded by Mr. Holmes to come, he never regretted it, although initially he found it a tremendous change from hospitals he had worked in before, such as the Royal Victoria Hospital, the Hospital for Sick Children in Great Ormond Street and the London Hospital.

Whom should he meet on his first morning in the hospital but Dr. Joe Fulton, in the doctors' parlour, who briefly outlined to him the routine on each visit, i.e. the meeting in the doctors' parlour, the times that tea was served, etc., and introduced him to the book that had to be signed weekly, after which he whisked him off to do a round in his surgical wards.

Even at this stage, i.e. 1939, Mr. McFadden was astounded to find the large number of patients, medical and surgical, acute and chronic, all mixed together, with no attempt made at segregation in relation to the type of illness. Some were recovering from minor surgery and some were beyond the hope of surgery. In one of the female wards he met a patient who had lain for about eighteen years, and another who had lain in bed for eight years. Another he remembers vividly who chose to lie in bed, holding on to her foot, attached only by some skin. She had refused operation because she knew that afterwards she would be asked to get up and about with crutches.

In an effort to sort out what was the best way to make better use of the beds, he introduced a system of classification according to surgical need, for example some only needed good nursing, some could be helped and restored to active life, some needed active surgical treatment and others just needed to be firmly prised out of their beds and their lazy life of luxury. One man with so called 'frost-bite' was, in fact, found sound. He was transferred from the com-

forts of his bed to a strange ward, after which he shortly left for home. The lady who had been in bed for eight years had had infantile paralysis with resulting contracture, was eventually straightened out with the aid of plaster of Paris splints to get up and go about on crutches. Another lady who had lain for eighteen years was similarly dealt with and was eventually fit to go home. When the time for going home approached, her husband who had hitherto visited her regularly, began to come less often. It became apparent that he was considerably embarrassed at the thought of his wife coming home after eighteen years. On one of his visits he picked up courage and told her that he had got a woman in. She quite understood this and told him she realised he couldn't do all the housework himself, but on hearing that there were two children in the house as well, she collapsed in floods of tears. Apparently things worked out quite well in the end, and she could be seen with her companion, who had been in the adjacent bed for eight years, coming up to the hospital subsequently to visit some of their old friends.

Gradually some surgical order was established, and in 1942 or thereabouts, when Mr. McMechan joined the Staff they organised an admission system. A regular take-in routine was started, and regular staff meetings were instituted. It could be said, therefore, that at this stage the routine running of the hospital from a medical and surgical point of view was put on a modern footing. It is really inconceivable to think of how the hospital ran, or how the visiting medical staff in those days did their work. They had no option but to take any and every patient that appeared from within the city boundary, whether they simply arrived at the hospital, were sent in by their own doctor or were chronic cases transferred from other hospitals in Belfast.

Many things have been said about the National Health Service, and indeed there is much criticism, but with its introduction in 1948 the function of the City Hospital changed dramatically, and certainly there can be no going back.

I can well remember the wards during my student days, and apart from Jubilee Maternity Hospital, they were a tremendous contrast to what we were used to in say The Royal Victoria or The Royal Maternity Hospitals. The long dark wards were crowded with patients, with a large open fireplace, sometimes two in each ward, high ceilings and wooded floors. They were, however, spotlessly clean and tidy. The consultants then were treated with the greatest respect, and when Mr. McFadden entered his ward he was met by the ward sister. There was absolute silence except for the sound of Mr. McFadden's low pitched voice, and the occasional voices of the students in reply to his questions. It was in this environment that many of us can remember Mr. McFadden's excellent teaching ward rounds, which I have no hesitation in saying were amongst the best we had. He was interested in abdominal surgery, upper gastro-intestinal surgery in particular. In paediatric surgery his work on urethral valves is still well known. He was a comparatively slow but meticulous operator, taking several hours to do a partial gastrectomy for example. In his earlier years he had no specialist anaesthetist and indeed this was so up until 1946, when the late Dr. Harold Jefferson came, as a trainee, being appointed to the staff in 1948. Mr. McFadden also had a particular interest in the prevention of shock and venous

thrombosis. Dr. Jefferson had to do half-hourly haemoglobin estimations during operative procedures and report to him. I am afraid it has to be said that he sometimes volunteered a favourable result so that they could all have one of the stipulated short tea-breaks. Another of his duties was to use a Higginson's syringe to put cold water into the theatre boots of the weary assistants.

I would mention that Mr. McFadden was President of this Society during 1956 - 57.

It would be impossible for me in this address to mention all the members of the Staff over a period of so many years. I have simply referred to three who covered a long span of approximately 50 years. Dr. Joe Fulton and Mr. Holmes, of course, are no longer with us, but I am glad to be able to report that Mr. McFadden is alive and very well in retirement in the South of England — Sunningdale.

Recently one of our senior nurses, who was his ward sister, visited him. Not only did she find him very well but living in very comfortable circumstances as befits a retired gentleman of his era. He still has his Bentley car and his ex-ward sister was met at Sunningdale station by Mr. and Mrs. McFadden complete with chauffeur-driven Bentley. I had hoped he might be here this evening but he does not feel up to the journey. He says he often thinks about Belfast, the hospital and his friends.

These three men dealt with the problems of the community at different stages, and as far as the City Hospital is concerned they contributed enormously to its development, its service to the community and the teaching of many generations of medical students and house officers.

UNDERGRADUATE AND POSTGRADUATE TEACHING

The admission of medical students and the relationship between the Guardians and the University seems to have been difficult over many years. The first request to take medical students was in 1857, determined by the fact that the number of patients in the General Hospital (Royal Victoria) had dropped to somewhere between 70 and 90, as it was necessary to have at least 100 for teaching the number of students at that time. Students were admitted, but classes were discontinued in 1862. A further request was submitted in 1877, and while students were re-admitted they were so beset by rules and regulations that they found it difficult to get into the wards. They took the matter up themselves, and wrote through the Honorary Secretary of the Belfast Medical Students' Association, who was then a Mr. T. Houston, later so well known as Sir Thomas Houston. But this was to no avail. Nothing really seems to have happened until 1913 when a further request was submitted, which was forwarded to the Poor Law Commissioners in Dublin, whose reply was incredible — they were not aware of any precedent for the admission of medical students, and did not advise the Guardians to agree.

There seems to have been a further lapse until 1923 when the Dean of the Medical Faculty and Professor of Pathology, Professor St. Clair Symmers, submitted a request through the Vice-Chancellor. He wrote on the 15th May, 1923

stating that senior students are compelled to go to Dublin and elsewhere in order to get clinical instruction as residents in hospital, as there was no room for them in the Royal Victoria Hospital. That hospital took nine students at a time and charged 35/- (£1.75) per week for their upkeep. The University desired to make the northern students independent of other places, and asked the Guardians to provide accommodation for six students on similar lines to the Royal Victoria Hospital. This was referred to a special Sub-Committee, who in June of that year reported that is was desirable to accede to the request of Professor Symmers. It was then only necessary to have formal approval from the Ministry of Home Affairs, which came through in November, 1923, with a note as follows: "The Ministry approve this progressive step on the part of the Guardians, which they trust will be of benefit to the sick poor in the Infirmary and the Medical Profession in Northern Ireland". The Guardians were still standing on their dignity and although the Vice-Chancellor had written to them, they would not go and see him, insisting that he come and see them. This little problem was overcome on the insistence of the visiting medical staff, who put pressure on the Guardians and on the 26th August, 1924 the first medical students took up residence for clinical instruction.

There were seven vacancies, and amongst the first group of students were a Mr. Blackstock, a Mr. W. Colquhoun and a Mr. M. Lavery. Mr. Blackstock qualified and entered the Physiology Department. Dr. Colquhoun was a Fellow of this Society and a very well known practitioner in Dunmurry, while Mr. Maurice Lavery became our senior surgeon. There were apparently no major problems from this time, except that the students were a little concerned at the cost of their accommodation, 37/6 (£1.87½) per week. In January, 1926 the Hon. Secretary of the Students' Union Society, Mr. J. A. Price, submitted a request that the charge for resident students be reduced to 30/- (£1.50) per week — the same as at the Royal Victoria Hospital. In their wisdom the Guardians reduced the charge to £1.11.6 (£1.57½) per week or 4/6d (£0.22½) per day.

I have referred so far to resident medical students, and in January, 1935 steps were taken to have medical students come for teaching ward rounds as had already been done informally with Dr. R. Hall, Mr. Holmes and Mr. H. P. Hall.

The student accommodation left something to be desired, and in July, 1937 the Professor of Surgery wrote stating that the students' quarters were shabby and inadequate with really no comfort and no place to work or study. He thought that these conditions were at least in part the reason for the students' activities being directed into less profitable channels. This led to a further slight reduction in the charge to thirty shillings (£1.50) per week, and a note to say that a scheme of redecoration was being put into effect, and that a billiard table was to be supplied.

The Guardians were suspended in March, 1939, and soon after this a request came from Queen's to the newly appointed Commissioners to the effect that they wished to extend the clinical teaching of the professors of medicine and surgery, proposing that they visit all the recognised teaching hospitals, and give clinical instruction to the students each week. This was readily agreed to by the

Commissioners and the Medical Staff. Things seemed to have gone smoothly, and in 1942 the Medical Staff indicated to the Commissioners that they would welcome closer collaboration and participation by the university professors in medicine and surgery, and were anxious to facilitate arrangements to this end. The professors became Honorary Visiting Medical Officers, and from this time we have the arrangement by which all Clinical Professors automatically have honorary contracts in the hospital. In July, 1942 the Secretary of Queen's wrote to say that the Faculty were happy to co-operate with the Belfast City Hospital Staff, and it was a matter of satisfaction to the University to have the co-operation between it and the City Hospital for the training of medical students. The Professor of Medicine was Prof. W. W. D. Thompson and in Surgery Prof. P. T. Crymble.

I have not mentioned Obstetrics and Gynaecology — formal teaching here seems to have had a less protracted start, and has been firmly established since 1921. Undergraduate teaching has continued without interruption since this time, forming an integral and essential part of the student curriculum. We take approximately half the total number of students entering the wards in their third year, so that many of them have their introduction to patients in the wards of the City Hospital. Fifth and final-year students also attend regularly for bedside teaching, tutorials and seminars. This has all been a very natural development in parallel with the University's recent extension on the site. I refer to the Medical Biology Centre opened in 1966, and the Whitla Medical Building opened in 1976, embracing between them the Basic Sciences and Departments of Anaesthesia, Oncology, Mental Health, Therapeutics, Geriatrics and General Practice.

It is difficult to understand the attitude of the Guardians towards the University, even in retrospect, which was clearly one of distinct reservation, but more rapid progress was made from 1939 when the Commissioners were appointed. The attitude of the Guardians, however, was incorrectly and very unfairly transferred to the medical staff. I became aware of this on joining the staff over 20 years ago, but on reading through the minutes covering the entire period it is absolutely clear that the medical staff were often frustrated and disappointed, finding it necessary to stimulate the Guardians, from time to time, into a more helpful attitude. Now we are fully integrated with the Medical School, our relationship is happy and constructive with many of the departments on the site, and some of their staff having clinical responsibility for the day-to-day care of patients in addition to their teaching programmes.

In the past decade postgraduate teaching has also been firmly established from a modest beginning in the City Hospital with the late Dr. Joe Hunter. We have the Belfast Postgraduate Medical Centre and other centres at various hospitals throughout the Province under the aegis of the Northern Ireland Postgraduate Council.

NEW HOSPITAL

Ever since 1933 there was increasing pressure on the Guardians, and later the Commissioners, to either upgrade the hospital or preferably build a new one.

In 1937 there were plans for a new hospital, with a suggestion that it would best serve the needs of the community by being on the east side of the river. Eventually it was decided to build on the present site, but by now the war had intervened and nothing further was heard of the proposals for several years.

A new planning team was constituted in August, 1961, and in 1969 site work started and the foundation stone of the new Hospital was laid in 1971. It is not my purpose this evening to justify the needs for this, but a look at the old hospital, its facilities and amenities can really leave no doubt, and it is ironic that the new hospital is being built on the site of the workhouse. Three floors constitute the podium, which includes an extensive postgraduate centre with a lecture theatre for 200, also extensive and elaborate student accommodation, the entire area taking up five acres. Rising from this is the tower block of eighteen floors, each of 25,000 sq. ft., rising to a height of 272 ft. Immediately above the podium in the tower block is accommodation for the medical school which will cater for the needs of at least three departments, with a lecture theatre for 200.

This is a vast project, which when completed will replace the present main hospital, Abercorn and all the supporting departments — out-patients, radiology, physiotherapy, accident and emergency, central sterile supply department, and have a total of 540 beds. Already it commands the skyline of South Belfast, and there can be no doubt that it is going to be a magnificent teaching complex, of which the Medical School, the city of Belfast and indeed the entire province can be justifiably proud.

I want to take this opportunity to thank sincerely all those who have helped me in providing information and material for this Address — Dr. Reginald Hall, Mr. D. Craig, Dr. H. Crozier, Dr. W. Boyd, Mr. McKee and Mr. Harry Millar. The latter was our Hospital Secretary until his retirement and without his assistance my task would have been impossible.

THE RESIGNATION OF ROBERT LITTLE FROM THE CHAIR OF MIDWIFERY AT INST.

by

PETER FROGGATT

(Vice-Chancellor's Office, The Queen's University, Belfast).

Several authors[1-3] have referred to the resignation, in May 1840, of Robert Little from the chair of midwifery and diseases of women and children at Inst: seemingly he had disagreed with the faculty and joint boards (of managers and visitors) over the requirements for the diploma which he issued to his students. Since this was the only whiff of serious discord between Inst and one of its medical staff — if we overlook some petty acrimony with Andrews at the time of his resignation from the chair of chemistry in May 1848 — and throws some additional light on Inst's attitude to medical education, the facts are worth chronicling briefly. In what follows unreferenced details are in my previous articles on the Inst medical school (1835-1849).[4,5]

SEQUENCE OF EVENTS

Robert Little was appointed to the foundation chair of midwifery and diseases of women and children on 6th October 1835,[6] one of the foundation medical chairs at Inst which were filled for the first session. Nothing has been written about him: the biographical details I have been able to uncover are described in the Appendix. He was an MD of Glasgow University[7] of 1826 and settled in Belfast before July 1827 when he was elected a member of the Belfast Medical Society.[8,9] In May 1828 he was appointed medical attendant to No. 4 District of the Belfast Fever Hospital dispensary, *viz.*, that "bounded by Lodge-lane, Millfield, Mill-street, and Falls road", sharing duties with Dr. T. H. Purdon.[10] In 1830 he was elected one of the four "attending physicians" to the hospital itself (with R. Stephenson, S. Wilson and Wm. Duncan)[11] and in 1835 he was added to the list of "consulting physicians"[12] after the customary five years of service on the staff.[13] About this time he was an active author with three lengthy articles and a book published all within two years[14-17] though I can find no record of his having published anything before or subsequent. He clearly stood well with his colleagues — his hospital promotion was rapid and he had been nominated in October 1830 by the *soi-disant* "Faculty of the Belfast School of Medicine and Surgery" (members of the hospital staff acting as a ginger group) to be professor of the theory of medicine in the proposed new medical school — and he also stood well with Inst which appointed him to give lectures in medicine during the three sessions (1832-35) preceding the founding of the medical school proper; while in 1835 he was elected first honorary treasurer of the faculty of medicine, a position of trust which he held for three years. His writings suggest a forthright personality, and with a well-expressed interest in his profession. He

was clearly energetic; and among his clinical duties were those as "physician to the Ulster female penitentiary".[15] His enthusiasm, however, may have outrun his judgement. He somewhat grandly described himself as "physician accoucheur to the Belfast lying-in charity",[16] a small facility which he started himself probably for some years in his own house though later at 15 Castle Street; [18] his book[17] is undiscerning and uncircumspect and makes wildly extravagant claims for the efficacy of iodine in the treatment of phthisis, and was not well-reviewed; [19] he was highly critical of gratuitous appointments to the hospital and dispensary staff[15] though for well-argued reasons, and in this was not alone;[20] unlike many of his hospital contemporaries he did not seem to have been active in literary, philanthropic, or scientific activity outside his profession. In 14 years in Belfast he had at least five different addresses.[21] Whatever were his abilities and personality he was clearly an important and respected medical figure in Belfast.

On 18 September 1838, the joint boards demanded copies of all "Tickets or Certificates or other Documents which [members of the faculty] have issued to students" and all details about them: [22] this arose from the faculty decision in April 1838 to issue lithographed "course tickets".[23] Little was faculty dean ("president") at the time and he, Drummond (professor of anatomy and physiology), and Marshall (professor of materia medica) forwarded these at once,[24] the other members only after reminders.[25] Little scrupulously followed this with a letter (on 29 October) explaining his custom of endorsing his ordinary class "ticket" to show credit for clinical as well as lecture attendance.[26]

The joint boards considered the documents on 4 December 1838. They approved them all except those of Little: seemingly he had been issuing, without faculty approval, a lithographed certificate in the form of a diploma, not the simple class "ticket" (Figs. 1 and 2), to students who had completed the midwifery course at his "lying-in hospital" but who had not necessarily studied any other subject nor even attended his own midwifery lectures at Inst, and the diploma was being accepted and no doubt being used by some students as a warrant of competence to practice midwifery with the *imprimatur* of Inst. The joint boards at once resolved: [27]

> ". . . that the Professor of Midwifery be informed of the conviction which these Boards entertain of the danger to the public and to the character of the Institution as issuing such a document . . . to students who under such supposed warrant think themselves authorised to practice Midwifery unless such students be previously examined and approved as competent by the Faculty of Medicine and that he be respectfully but earnestly requested not to issue documents of the kind submitted . . . except to students who have been thus examined and approved . . ."

and this was communicated to the faculty and to Little personally.

The resolution was considered by the faculty on 12 January 1839, with Drummond in the chair deputising for Little who was dean for 1838-39. The members concurred and proposed further that to receive any "diploma in midwifery" a candidate must have attended at least one course of lectures in anatomy,

chemistry, surgery, materia medica, "practical physic", botany, and medical jurisprudence (not in fact introduced as a taught course until November 1839) "in addition of course to his studies in Midwifery."[28] To allow Little to reply a special meeting was called (for 14 January) when, with only Andrews and

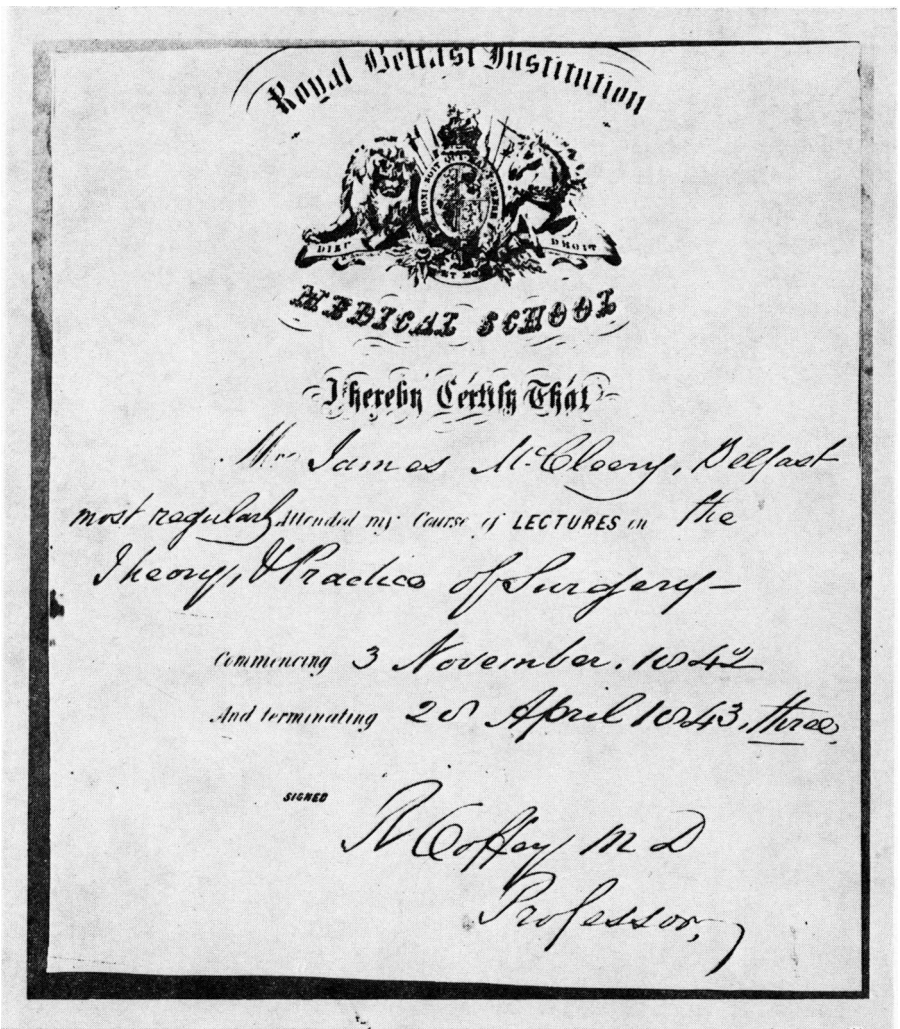
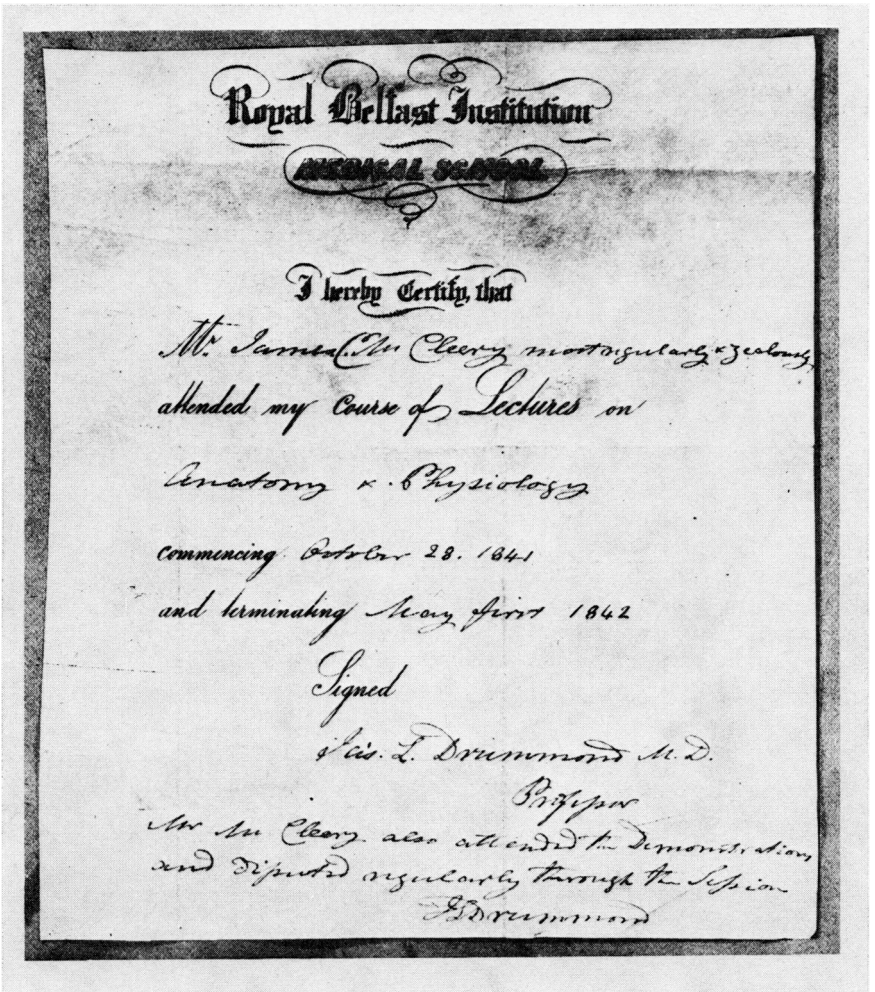


FIGURE 1

A class "ticket" for 1842-43 *issued by Robert Coffey, Professor of Surgery to James Caughey McCleery. It measures* 7½" x 8". *Note the coat of arms and scroll printing and that it merely attests attendance at classes. (Reproduced by courtesy of the RVH Archivist)*

McCormac absent the proposal of 12 January was ratified.[29] Little from the chair alone dissented and "begged to enter his [written] protest against it", and this was allowed with the "request" that it be given that same evening to the faculty secretary (Marshall) for immediate transmission to the joint boards in time for their stated meeting the next day. This "protest" is printed here *verbatim*.


Royal Belfast Institution

MEDICAL SCHOOL

I hereby Certify, that

Mr. James Mc Cleery most regularly & zealously

attended my Course of Lectures on

Anatomy & Physiology

Commencing October 28. 1841

and terminating May first 1842

Signed

Wm. L. Drummond M.D.

Professor

Mr Mc Cleery also attended the Demonstrations

and Dissected regularly through the Session

L Drummond

FIGURE 2

A class "ticket" for 1841-42 *issued by James Drummond, Professor of Anatomy and Physiology, also to McCleery. Note the endorsement concerning attendance at practical classes: the joint boards allowed such endorsements in all subjects including midwifery (see text). (Reproduced by courtesy of the RVH Archivist)*

Dr Little's protest

1. Because the Diploma which I have hitherto given to the students attending my practical class is precisely of the same character as that which is granted to all students of Midwifery in a University, College, or private Medical School in the Empire.

2. Because witholding such a document from students who have passed a satisfactory examination would injure the Medical School in Belfast by sending students to other places where such a Diploma can be had without any such obstruction.

3. Because in every Medical School such a Diploma is given immediately after attendance in the practical class without any investigation as to the number of other classes such students may have passed through.

4. Because the class of practical Midwifery in a private establishment, ["lying-in hospital etc" at 15 Castle Street] having been formed by myself long before the Medical School in the Institution was opened, and is not therefore under the control of the Faculty or Board of the Institute.

5. Because any physician had the right to establish such a class and may, if he think proper, give such a Diploma: and therefore in my private class I have a right to give such a document to all that are qualified, and the Faculty has no authority to interfere more than in any other portion of my private practice.

6. Because while the refusal of such a Diploma would in the first place destroy the Midwifery class and all students would naturally go where a similar document can be had without impediment, it would [also] injure all the other medical classes in the Institution. It is well known that during the present session the classes are not so large as they were during the past owing to the reports prevailing at November last that my Diploma would be withdrawn. The dread of this circumstance led many to go elsewhere to the serious diminution of all the classes of the Medical School.

7. Because the Midwifery Department is of such importance that if it be placed on a more unfavourable footing here than elsewhere the necessary effect will be the injury or destruction of the whole Medical School.

This "protest" was lodged with Marshall, but it was seemingly never forwarded to the joint boards![30] Little now decided to approach the joint boards himself: writing for their meeting on 5 March concerning "your very *extraordinary resolution*" (Little's italics) [of 4 December 1838[27]] he emphasised that "my Lying-in Charity has at present no connexion with . . . this Institution" and that he had stopped attending the College Hospital (the "Old Barracks" which Inst owned and which Little had attended as physician since 1837) and

therefore was free to act as he had.[31] The joint boards now resolved to ask him for copies of the certificates "or other documents" which he "now intends to give . . . students after the lecture course".[30] Little described these (by letter of 19 March) but seemingly sent no copies![26] The joint boards considered the business nonetheless. They approved Little's practice of endorsing simple class "tickets" to show clinical attendance since it was common practice (Fig. 2): but "with regard to the Certificate given to the other students which you state is in a form prescribed by the London and Edinburgh Colleges of Surgeons [we] can produce no opinion as to its propriety until the form be submitted to [us] . . . In the meantime [we] . . . cannot approve or in any way sanction the issue of Diplomas, likely to be used as qualifications for practice, by any Professor connected with this Institution so long as such connexion continues no matter whether such Documents propose to be issued by him as a Professor of the College, or as a private Practitioner."[26]

Little never sent the documents, nor had he any other contact with the joint boards, or they with him, and very little with the faculty of which he was now dean. He drifted into disinterest. Usually a good member[32] he attended only three faculty meetings between 14 January and 21 September 1839 and none at all during the 1839-40 session though he continued to conduct his classes and collect his class fees and salary. On 5 May 1840, the session completed, he resigned "having made arrangements to leave the country about the 1st of the next month".[33] His letter is short and polite. He also resigned from the Belfast Medical Society on 1 May[9] and his honorary post of consulting physician to the Fever Hospital.[34] His name disappears from the archives of college, hospital, and town (see Appendix). On 18 August, William Burden succeeded to the chair. On 28 October he did what Little had refused to do, namely — endorse the faculty view that there should be no midwifery diploma without attendance and examinations in the theory and practice of midwifery and examinations in other faculty subjects;[35] and on 18 March 1841 the faculty agreed[36] his redesigned diploma broadly along the lines of their proposals of 12 January 1839.[28] The resolutions of faculty and the joint boards had prevailed.

COMMENT

There is no doubt that Little was awarding an obstetrics diploma to his students without formal, if any, examinations, and that this was a more substantial document than the standard class "ticket" attesting attendance on a course (Figs. 1 and 2).[37] The basis of his "protest" was (i) that his diploma was of a "character" general throughout the "empire"; (ii) that failure to award it would drive students elsewhere which would be damaging to Inst; (iii) that attendance at other courses was unnecessary and not demanded in other schools; and (iv) that the diploma was given after attendance at his "private establishment" and therefore outside faculty jurisdiction. Each of these is now examined briefly in turn.

As regards (i) (uniformity with other midwifery certificates), Little had a point. Certificates of competence in midwifery were valuable to a potential

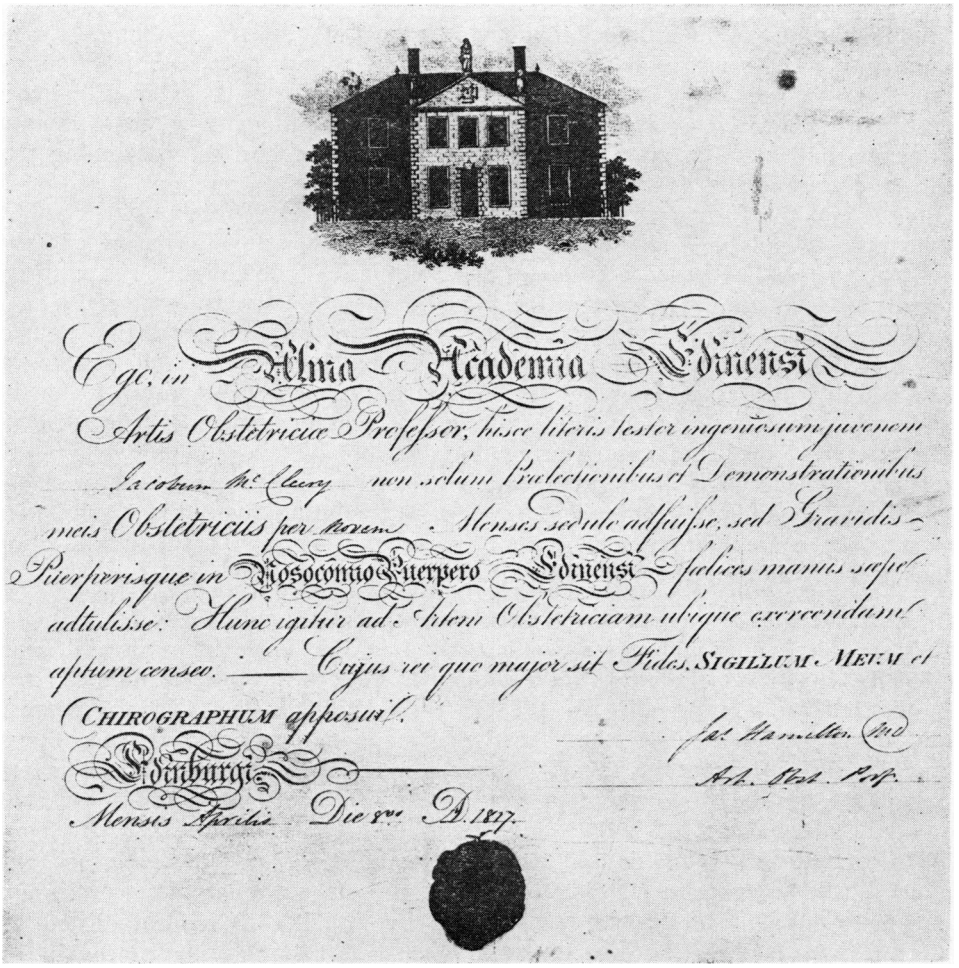


FIGURE 3

A midwifery "diploma" issued by the Professor of Obstetrics at Edinburgh University in 1817 (*Little's "diploma" was probably of the same general form*). *It measures* 13" x 14" *and attests far more than class attendance as in Figs.* 1 *and* 2. *It reads*: *"I, Professor of the Art of Obstetrics in the University of Edinburgh, hereby testify that James McCleery, a learned young man not only diligently attended the lectures and demonstrations in obstetrics for nine months but also frequently successfully attended women during their pregnancy and in childbed. I hereby certify that he is fit to practise the art of obstetrics throughout the world. In further evidence of this I have appended my seal and signature.* (*signed*) *James Hamilton, MD, Professor of the Art of Obstetrics,* 8 *April* 1817". *This James McCleery is the father of the McCleery in Figs.* 1 *and* 2. (*Reproduced by courtesy of the RVH Archivist*)

practitioner and were in much demand. Impressive obstetric parchments were given by many licensing bodies and important schools or hospitals: for example the Rotunda Hospital, Dublin, and the professor of obstetrics in Edinburgh University (James Hamilton, 1800-1839), awarded diplomas, without examination, to students who attended their obstetrics course, the latter claiming that the student was "fit to practise the art of obstetrics throughout the world" (Fig. 3) and the former that he was "a skilled and experienced obstetrician"![39] Provincial schools in England, which were rarely under any formal or effective control,[5] when they issued certificates at all naturally followed suit. By requiring faculty of medicine *imprimatur*[27] the joint boards of Inst were asserting a basic college principle in the interests of academic standards and academic control and denying to Little individual action such was, for example, allowed to, or assumed by, Professor Hamilton in Edinburgh (Fig. 3). By requiring in the diploma evidence of attendance at courses in the other subjects of the faculty[28] the faculty of medicine was ensuring that the diplomate would be well-read in relevant subjects as well as proficient in obstetrics; in fact be virtually of the "final-year" standard of the day. Inst was demanding standards higher than most other contemporary schools and universities, and on Little's resignation took steps to impose them on his successor, Burden.[36]

As regards (ii) (importance of attracting students), again Little had a point. Existing data on enrolments are summarised in the Table: two crucial years (1838-39, 1839-40) are missing but we know from Little's "protest" (above, para 6) that classes were smaller in 1838-39 than 1837-38. The evidence suggests that enrolments in 1840-41 (the year after his resignation) are everywhere lower than in 1837-38 except in "physic"which is a special case since the chair was only filled for the first time that year. Midwifery enrolments fell more than any other — except for botany, a summer class, but here the 1837-38 figure looks exceptional — and indeed never again quite regained the peak achieved under Little. Students enrolled for individual subjects, not a complete curriculum, but most enrolled for several e.g. all but two of the 13 students listed for midwifery in 1844-45 (the only year for which a full nominal list of enrolments exists)[38] were also enrolled for at least one other subject. It seems likely, therefore, that anything reducing midwifery enrolments would also have reduced total subject enrolments, as Little argued. Certainly Inst was vulnerable — the school was only recently opened and the tradition of Ulster students studying medicine elsewhere had been well-established and could easily become well-established again — and it is to the joint boards' and faculty's credit that they were uninfluenced by such considerations.

As regards (iii) (attendance at other courses), Little seems to have been correct. So far as I can discover, midwifery certificates in other schools were issued, either in the name of the professor e.g. Edinburgh (Fig. 3) or if a hospital, the names of the Master and his colleagues e.g. the Rotunda.[39] Inst was to be the exception[36] because of its unique nature as an incorporated (under act of parliament) "Academical Institution" with professors, faculties, formal administration and accountability, and a licence-orientated curriculum, rather

than as a private school associated with a hospital and run by hospital staff as was generally the case in England, or as an older university foundation with departmental autonomy and strong city council or professional body influence as was generally the case in Scotland. As already noted Inst was demanding and enforcing standards rarely reached elsewhere.

As regards (iv) (acting in his private capacity), Little is questioning Inst's right to interfere with his actions taken as a private practitioner in his private establishment (his "lying-in charity") in Castle Street. He is on questionable ground professionally; no ground at all constitutionally. Though no copy of his "lithographed certificate" survives he was issuing them in his capacity as (paid) professor of midwifery at Inst and to students enrolled at and through Inst, who attended his lectures given at and advertised by Inst and co-ordinated as an integral part of the faculty syllabus also by Inst and who used Inst facilities, and the certificate itself no doubt bore the Inst coat of arms or other insignia (see e.g. Fig. 1). To exploit these without allowing any Inst discretion was not only unrealistic but also outwith Inst's authority. Under the Act of Incorporation (50 Geo. III, c.193) the proprietors were empowered to make bye-laws (sect. II) and in the first set, made in 1810, sect. XXV reads: "The Board of Managers and Board of Visitors [joint boards] . . . shall . . . have authority to make rules for . . . the regulation of the college and schools [including] the authority which shall be exercised by the Professors and Masters . . . ; [and] *the manner in which students shall receive testimonials of proficiency in their several studies, so as to secure the public confidence* . . ."(my italics). The joint boards' resolution of 4 December 1838,[27] reproduced above (page 20) is therefore not only reasonable but proper.

CONCLUSION

Little was within his rights to "protest" to faculty and the joint boards: in issuing his diploma without reference to faculty or joint boards or without examinations he was merely following common practice of the day. His arguments are valid and some persuasive; but in rejecting them the joint boards were acting wisely in the interests of Inst and entirely within their authority under their bye-laws made under the Act of Incorporation. Little's subsequent disinterest in faculty affairs, then his resignation, indicate that he could not accept the decision. No opprobrium should be linked to his name nor to the joint boards or the faculty of medicine in this unique affair in the history of the Inst medical school.

ACKNOWLEDGEMENTS

I am indebted to Mr. Gordon Wheeler, The Queen's University library, and various correspondents for helping me to obtain biographical material on Little; to Mr. Michael Moss, Archivist, University of Glasgow, for searching records and quoting from the roll of graduates; to Dr. Hugh Calwell, Archivist at the Royal Victoria Hospital, for lending me the diplomas which are reproduced as Figures 1-3; and to Professor Michael McGann, Queen's University of Belfast, for the translation in note 36.

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Minute Books of the Joint Board of Managers and Visitors (SCH 524/3A/1-6): *JB* followed by the appropriate volume number *viz IV* (1828-36), *V* (1836-42), pagination, and date.

Letter Book of the Institution (SCH 524/7A): *Lett. Bk.* followed by the appropriate volume number *viz. III* (1833-46), pagination, and date if recorded.

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6. *Lett. Bk., III,* 79; *JB, IV,* 346. He received 13 of a possible 15 votes.

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8. Little does not appear in *Pigot and Co's City of Dublin and Hibernian Provincial Directory,* etc. London: Pigot, 1824.

9. *Minute Book, Belfast Medical Society,* 1822-1828, 2 July 1827; 'A List of Subscribers to the Belfast Medical Library', in – *Ibid.,* 1842-52, p.iii.

10. *Rep. Fev. Hosp.,* 1827-28, p.7.

11. *Ibid.,* 1829-30, pp.3-4.

12. *Ibid.,* 1834-35, p.3.

13. *Ibid.,* 1826-7, pp.4-6, resolution No. 15.

14 LITTLE, R. (1834). Practical observations on the treatment of some of the diseases of the lungs, etc. *Dublin Journal of Medical Science, 5*:69.

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16. LITTLE, R. (1836a). Practical observations on some of the most common causes of tedious labour. *Dublin Journal of Medical Science, 9*:6.

17. LITTLE, R. (1836b). *A Treatise on the Prevention and Cure of Pulmonary Consumption.* London: Longman, Rees, Orme, Brown, Green and Longman.

18. *Martin's Belfast Directory for* 1840-1841. Belfast, 1840, p.255. There is an entry: "Lying-in Hospital and Dispensary – 15 Castle Street, for diseases of women and children, and of diseases of the chest; open from 11 until 12 o'clock daily – Dr. Little, medical attendant". This is not referenced in any other Belfast directory though it had existed since at least the early 1830s, possibly in Little's residence. The householder at 15 Castle Street in 1840 is "John Maguire, dyer". It was here that Little conducted his practical classes which

qualified students for his disputed diploma. It is not to be confused with the larger "Lying-in-Hospital" in Donegall Street and, from 1840, in Clifton Street, forerunner of the Royal Maternity Hospital. This latter did not accept students until 1853 (Macafee, *op. cit.*, ref. no. 2) despite repeated approaches starting with Drummond's celebrated public "letter" in the *Newsletter* for 7 November 1826 ". . . it would form to [medical] students a most valuable source of improvement and the poor patients would certainly be in better hands than in those of our midwives who are universally ignorant and untaught . . ." (letter reproduced in full in *Minutes of the Fever Hospital Committee, 17 December* 1826, p.234). These early minute books of the hospital committee have only recently come to light.

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21. Street directories and almanacs show his addresses chronologically as: High Street (1827-), 94 Donegall Street (1831-), 92 Donegall Street (1835-), 9 Donegall Place (1838-) and 59 Upper Arthur Street (1840).

22. *JB, V,* 207. His course consisted of lectures four days per week for the six-month session and "attendance on at least" 30 cases at his lying-in hospital (in Castle Street) (see ref. No. 4 above, Fig. 7).

23. *FM,* 3 April 1838.

24. *JB., V,* 221 (23 October 1838).

25. *JB., V,* 221 *seq.* (6 November 1838); 229 (20 November 1838).

26. Ass. Secr. to Little of 20 March 1839 (*Lett. Bk., III,* 273).The original letter of 29 October has not survived but the joint boards may not have been satisfied with Little's original returns (see ref. no. 24 above) and requested more details.

27. *JB., V,* 231 (4 December 1838).

28. *FM.,* 12 January 1839.

29. *FM.,* 14 January 1939.

30 *JB., V,* 244 (5 March 1839), where the boards complain they have never received it! The "protest" is entered in the faculty minute book between the minutes of the meeting of 14 February and the next one on 25 February 1839, but draft minutes were often kept as separate notes and entered into the book much later (and sometimes not at all!) so the date of Little's submission is not definitely known but I would think he complied with faculty wishes.

31. *JB., V,* 243 (5 March 1839).

32. In the year August 1837 to July 1838 he missed only five of 18 meetings.

33. Little to joint boards of 5 May 1840 (SCH524/7B/34/12); *JB., V,* 301 (5 May 1840).

34. *Rep. Fev. Hosp.,* 1840-41, p.3.

35. *FM.,* 28 October 1840.

36. *FM.,* 18 March 1841. Burden's diploma is reproduced in my earlier article (ref. no. 4 above, Fig. 8) though incorrectly described as a "general medical certificate", a regrettable error forced by my ignorance of Latin! It reads: "Inasmuch as we, the Medical Faculty of the Royal Belfast College, have been informed that John Hood, a student of this College, has not only over a period of six months heard in our College lectures on obstetrics and on the diseases of women and infants, but has also over a period at least as long assiduously attended to the practice of this art and has given great assistance, under the eyes of our Professor of Obstetrics, to many women in labour, after the holding moreover by ourselves of careful examinations, which he most successfully sustained, we therefore are of the opinion and testify that the same John Hood is entirely fit for the practice of Obstetrics, in guarantee of which we have subscribed our names and affixed the common seal of the College". (signed by the seven professors of the faculty and dated 1 May 1834).

37. No example of Little's diploma has survived in hospital or college archives.

38. The nominal list is reproduced in Jamieson (*op. cit* ref no. 1, 257-266). It gives 13 enrolments in midwifery but a more reliable total is the 16 presented in the *Annual Report* which was compiled at the end of the session (*JB., VI,* 79 (1 July 1845)). This is the figure used in the Table.

39. The diploma issued to James Caughey McCleery on 28 October 1846 is filed in the Archivist's room at the R.V.H. It reads (translated from the Latin): "The Master and Domestic Assessors of the Dublin Lying-in Hospital do hereby testify that JAMES CAUGHEY MCCLEERY, a learned and upright young man, not only paid diligent attention to our lectures on obstetrics, but also successfully attended women in childbirth for six months. We therefore approve of the aforesaid as a skilled and experienced obstetrician. Signed: C. Johnston (Master); A. H. McClintock and J. Dunham (Assessors); J. G. Strickland (Registrar)". It is a scroll-printed parchment headed by an engraving of the Rotunda Hospital.

APPENDIX

Robert Little received the MD degree of Glasgow University on 23 March 1826. The roll of graduates lists the following information: "Wolverhampton; Holywood, Co. Down; Manchester; Belfast; Scone, N.W. Wales; Belfast; Donaghadee; formerly lecturer on Medicine and midwifery in Belfast College". His origins are unknown. He was in Belfast from 1826 or 1827 until 1840 (see text) but is not listed subsequently in any local or Irish directory or register nor in the Royal College of Physicians (of London) *Medical Directory for Ireland* of 1852 and 1856 or their *London and Provincial Medical Directory* for 1845. He is, however, listed in the latter directory as practicing in Wolverhampton from 1848 to 1852: the entries for 1848-50 list him as "MA, MD"; that for 1851 as "MA, MD, (Giessen) 1824"; and that for 1852 as "MA, MD, (Glasgow) 1826". The general directories for Wolverhampton show him as "MD, Physician" and practicing in Church Street in 1847 and Darlington Street in 1851. He has no entry in the first national *Medical Register* (1859). The University of Giessen, West Germany, has no note of any Dr Little in their records or in their list of "Doktor-promotionsverzeichnis" for 1801-1884 (compiled by Franz Kossler and published in Giessen in 1970), but general enrolment lists to their medical and other faculties especially of non-doctorates are incomplete. Little may have studied at Giessen as well as Glasgow: the 1851 Wolverhampton directory entry ("Giessen") seems an unlikely mistake or misprint, and the date ("1824") is compatible with taking his Glasgow MD in 1826.

The entry from the Glasgow roll of graduates seemingly reverses chronological sequence. Thus Little could have originated in Donaghadee or started in practice there with periods in Belfast and Holywood *after* leaving Belfast (in 1840) for, presumably, N.W. Wales and later Manchester before finally settling in Wolverhampton between 1845 and 1848. I have been unable to find any reference in Irish directories to any "Dr Robert Little" after his entry as at 59 Upper Arthur Street in the Belfast Directory for 1840-41 (however in smaller towns only substantial citizens were listed which not always included physicians) except a "Dr Little" listed in Henderson's *Directory* for 1843-44 as at 17 Arthur Street (Ann Bullick, grocer, is proprietor), and cross-indexed in the nominal lists of both Physicians and Surgeons: since in previous directories Robert Little always appeared as "Robert Little, MD," and was included only

in the nominal list of Physicians this Dr Little may have been a different person. Several other Littles were practicing medicine and/or surgery in the north of Ireland by the 1850s, and two are listed in the first *Medical Register* (1859). Robert Little presumably died, emigrated, or left practice between 1852 (his last Wolverhampton entry) and 1859 when the first *Medical Register* was published.

TABLE: ENROLMENTS FOR SUBJECTS IN THE FACULTY OF MEDICINE, 1836-1849[1]

Subject	1836-37	1837-38	1840-41	1842-43	1843-44	1844-45	1845-46	1846-47	1847-48	1848-49
Anatomy	19	38	35	42	38	54	54	37	43	33
Practical chemistry[3]	nn	21	17	25	—	—	—	—	—	—
Chemistry	19	25	17	26	26	29	44	36	33	45
Practical anatomy[2]	14	13	8	5	9	16	13	8	nn	nn
Midwifery	9	17	8	14	12	16	16	12	14	11
Practical midwifery[4]	9	12	4	—	—	—	—	—	—	—
Materia Medica	9	7	5	5	6	6	10	6	8	6
Natural History[5]	7	7	—	—	—	—	—	—	—	—
Surgery	13	23	17	33	24	28	28	15	24	13
Botany[3]	8	20	6	6	10	16	11	10	14	20
Physic (theory and practice)[6]	—	8	9	7	14	6	18	7	9	10
Total enrolments (omitting practical classes and Natural History)	77	138	97	133	130	155	181	123	145	138

1. Data for 1835-36, 1838-39, 1839-40, 1841-42 are missing.
2. This was not separately distinguished after 1842-43.
3. These subjects were summer courses.
4. This category disappeared after Little's resignation.
5. This was discontinued after 1837-38.
6. Enrolments are listed as "physic" or "practical physic", here they are combined.

nn=not noted.

THE ROD AND THE STAFF

by

JAMES ELLIOTT, MD, FFARCS, FFARCS(I)

ANNUAL ORATION AT THE OPENING OF THE 1978-79 TEACHING SESSION, ROYAL VICTORIA HOSPITAL, BELFAST

THREE quarters of a century ago the Royal Victoria Hospital moved to its present site from Frederick Street where, as the Belfast General Hospital, it had opened for the reception of patients in 1817. The late Dr. R. S. Allison records that the first registered pupil, a Mr. W. Bingham, was admitted in 1821 and an opening address to the students was given by Dr. James McDonnell five years later in 1826. This practice has been maintained in the intervening years although its character has changed to the present rather formal occasion on which the speaker, now dignified by the title 'Orator', has two functions to perform.

The first, an unqualified pleasure and privilege, is to extend on behalf of his colleagues on the Staff a welcome to those of you who are students, in particular any attending hospital in their first term, and this I now do most warmly.

The second, a less agreeable obligation, is to address you on a subject of his own choosing. In 1884, despite an enlightened alternative proposal, it was decided to continue the practice of nominating the 'Orator' simply by seniority of appointment, conveniently ignoring any possibility that the living wisdom of experience might by then have become petrified with age. This misguided system is still retained, and accounts for my present unhappy predicament and your forthcoming half hour ordeal. When the Harveian Oration of the Royal College of Physicians was instituted about three centuries ago a condition was that it should be spoken in Latin. You may think it fortunate that at least I am under no such compulsion this morning. I have an option and I opt for English. *Sic transit mos maiorum.*

The 'Royal', in which much of your early clinical training will take place, has multiple roles, as a teaching hospital, a district hospital, a hospital with Province-wide responsibilities in a number of technically advanced specialities, and as a centre of medical research and innovation. As a consequence its size, technical expertise and work-force have dramatically increased in recent times, and I suppose never before in its history has it served the community, or indeed medical science, with greater distinction or wider recognition than in the past ten or so unsettled years. Yet in such a crowded atmosphere of activity and achievement, priorities easily become obscured, identities submerged, lines of communication between patient and doctor stretched or broken. Regardess of any general deficiencies there may be in the system, we have, it seems to me, as individuals, a particular responsibility, perhaps the central one, in resisting any such trends. For despite first impressions this hospital, in which many of us feel privileged to work, is not primarily about the impressive display of doctors, nurses, administrators or even medical students, to be seen daily in its corridors,

clinical rooms or offices; it is about patients, people like you and me, at whose bedsides theory meets practice, science meets humanity. Here, with whatever resources of faith or fortitude they can command each one faces his or her own particular 'Valley of the Shadow,' ill-at-ease, dis-eased in body, mind or spirit. The 'Royal' will have fallen short both in its teaching and its humanitarian roles if as students within its walls you have not seen practised and so been encouraged to adopt, a medical ethic which requires as essential and complementary items in your equipment, not only the 'rod' of academic and clinical discipline, without which your niche is not specifically in medicine, but also the supporting 'staff' of compassion and understanding, lacking which you will qualify as scientific robots, unfeeling, even dangerous.

No branch of medicine can have been more exclusively directed to the easing of suffering than anaesthesia at its inception. Medicine's other aim, the saving of life, was added as the techniques of the specialty developed.

In the 11th century an Anglo-Saxon monk wrote: "For eruptive rash let him sit in cold water until it be deadened; then draw him up. Then cut four scarifications around the pocks and let drip as long as he will." It was an unsavoury and hardly convincing recipe for surgery without tears, and even eight centuries later, in 1839 Louis Velpeau, a distinguished French surgeon could still say: "To avoid pain during operations is a chimera – cutting instrument and pain in operative surgery are two words which never present themselves one without the other, and it is necessary to admit the connection." Seven years later however this authoritative but rash prediction was proved wrong, and anaesthesia and surgery established a symbiotic association, whose potential far-reaching benefits were at first overlooked in the prevailing general relief among surgeons as well as patients at the bright immediate prospect of operations without pain, either inflicted or suffered.

I would like this morning to say something about the discovery itself and then to mention some subsequent significant milestones, in so far as they influenced further surgical advances, referring to just a few of the people involved. I have not in any way attempted a comprehensive or detailed history of the subject.

At a number of critical points in human history the long march of 'Everyman' has been given fresh impetus or new direction by some basic discovery. The wheel, the printing press, the internal combustion egine, flight, the splitting of the atom, were such events, each, however, concealing seeds of future death and destruction. Anaesthesia, one epoch-making discovery free from any lurking potential for evil, was described by Oliver Wendell Holmes as "one of those triumphs over the infirmities of our mortal condition that change the aspect of life ever afterwards".

Victor Hugo believed that there is nothing in the world so powerful as an idea whose time has come; provided, I suppose one might add, that the idea is a good one. Although dire penalties, of which lynching or the threat of it seems to have been popular, were still a hazard for those few daring souls bold enough to promote some unorthodox concept or practice, isolated events over the first

half of the 19th century, including a few valiant but abortive efforts to 'sell' the idea of pain-free surgery, were preparing the ground for its final acceptance. On the morning of 16th October, 1846, William Thomas Green Morton successfully demonstrated to a distinguished and at first sceptical medical audience at the Massachusetts General Hospital, Boston, the anaesthetic properties of ether during the removal of a vascular tumour from the neck of one Gilbert Abbott, a name hitherto obscure but henceforth linked with the historic occasion (Fülöp-Miller, 1938).

Three centuries earlier an eccentric man of genius with the improbable name of Theophrastus Bombastus von Hohenheim, better known to you as Paracelsus, had put chickens into a sleep from which after a time they awoke safely, using ether which he knew as 'sweet vitriol'. Although he went on to recommend it for the alleviation of painful complaints, he did not suggest its use to make surgery painless. In 1842, just four years before Morton's success, Dr. Crawford Long had used ether in minor operations on about eight patients, including a man named James Venable, in his country practice in Jefferson, Georgia, but was understandably dissuaded from persisting by the threatening attitude of the townsfolk. A vivid eye-witness account has survived and the following extract explains his reluctance: "The day James Venable had a tumour cut out I happened to be in Jefferson. A group of excited men were gathered in the square and vowed they would lynch Long should the boy fail to arouse from the effects of the ether. Not long to wait, the door opened and we were told all was over, Venable was safe, the tumour out, and no pain felt by the patient." And in 1844 Horace Wells, a former partner of Morton's, got short shrift from the students and members of the Medical Faculty at Harvard when one of their number to whom he had administered nitrous oxide for the removal of a sore tooth objected violently when the offending molar was grasped in the forceps. His failure, and that of others after him, to recognise the inherent limitations of nitrous oxide as an anaesthetic agent, led to many dental sessions when the only obvious effect of the gas on some robust unpremediated labourer of bibulous habits, was to liberate him from any irksome restraint on his behaviour that a sense of loyalty to Lord Queensberry's rules of fair play may hitherto have imposed, placing dentist, anaesthetist and anything else within range of his hands or feet in imminent danger. Wells, however, attributed his lack of success to giving too little of the gas and, determined not to make the same mistake twice, nearly killed the next patient by giving too much and thereafter gave up the effort.

This audience will be pleased to know that Morton, already a qualified dentist, was at the time of his successful demonstration a mature medical student, having resumed studies at Harvard the better to pursue his quest for a painless way of extracting and crowning teeth. He had the mistaken, if natural, conviction that success in his endeavours would lead to fame and fortune by inducing the discriminating citizens of Boston to flock to his office, in preference to those of the other dentists in the city, to have their aching teeth uprooted in blessed oblivion. But his ultimate fate was far different from any such rosy prospect for he died at the age of 48, in 1868, penniless, and unknown except by a few, while driving with his wife, in a borrowed carriage, through Central Park, New York.

He had been continuously subjected since his great discovery to a bitter and unrelenting campaign of vilification and malicious innuendo initiated and kept going by Dr. Charles T. Jackson, a Boston scientist whose standing and influence concealed a paranoid madness that finally overwhelmed him. Morton was not the first object of his attention. Fourteen years earlier in 1832 he had met and talked with Samuel Morse during an Atlantic crossing. This chance encouter nearly cost Morse his fame as the inventor of the electro-magnetic telegraph, for Jackson on his return to the States did his utmost to undermine Morse's claims and advance his own by letters to Congress, the Patent Office and any other body that would listen.

Morton, until his discovery an unknown dentist, emerges from the haze of conflicting contemporary accounts as a rather tragic figure. A man of little formal education but considerable intelligence, his vision, industry, patience and courage in the face of many setbacks were greatly underestimated at the time and even to some extent since his death. One of his sons was awarded the Victoria Cross in the Zulu wars (McQuitty, 1969).

Many of the central figures in the drama came to grief in one way or another. Long's successful use of ether in Jefferson, Georgia, had preceded Morton's by four years, thus qualifying for posthumous mention in the Guinness Book of Records. He served for a time in the Confederate Army and finally returned to his country practice embittered, depressed and almost destitute, where he died suddenly in 1878 when about to administer ether to a woman in labour. Wells, who had failed with nitrous oxide, became a chloroform addict. He was imprisoned for throwing a flask of vitriol over two prostitutes in a gesture of vengeance against a society that had failed to recognise his claim to fame, and finally in 1848 committed suicide. Jackson's obsessional madness took increasing control. By now a drunkard he chanced to come across Morton's grave on which were the words: "Inventor and revealer of anaesthetic inhalation". He became manic on the spot and spent the remaining years of his life in a lunatic asylum.

But the freer use of surgery that followed the discovery of anaesthesia was not associated with a corresponding fall in percentage death rate, which consequently in absolute terms rose steeply. James Young Simpson of Edinburgh, famous for the introduction of chloroform as an alternative to ether said: "The man laid on the operating table is exposed to more chances of death than the English soldier on the field of Waterloo". And the cause was sepsis or putrefaction, always a scourge in armies in the field but now also rife in the wards of civilian hospitals as the rural existence of the 16th and 17th centuries was overtaken by the squalor, overcrowding and accidents of the industrial age. In these circumstances, surgery, even though painless, was bound to remain a last despairing option.

Joseph Lister, later to become the first medical Peer, transformed the grim picture and initiated a new, safe era in surgery when he published in 1867 his historic paper on antisepsis. Characteristically meticulous, he added in 1870 the notorious spray which indiscriminately enveloped the entire surroundings of the part being operated upon in a cloud of 1 in 40 carbolic lotion. This refinement, in addition to killing the germs, did not do the surgeons much good, and was soon

abandoned. Continental surgeons were quick to see the significance of Listerism, but in Great Britain and Ireland it was a different story. In 1873, six years after Lister 's publication, Sir John Erichson, a distinguished surgeon at University College Hospital and author of a major textbook, addressing the students at the start of the academic year, had sepsis very much in mind when he ventured the opinion that the limits of surgery had almost been reached. The abdomen, chest and brain he thought, would be forever shut from the wise and humane surgeon. And as to John Bull's other island, Lister's biographer (Godlee, 1924) is unimpressed: "Little need be said about the reception of Lister's technique in Ireland", he writes, "in Dublin and Belfast leading surgeons, with a few notable exceptions, either smiled at the innovation or ignored it".

But there was a brilliant exception in the person of Sir William Macormac, born in Belfast in 1836 the son of Dr. Henry Macormac from Co. Armagh, whose distinguished careers were the subject of Sir Ian Fraser's Presidential address to the Ulster Medical Society in 1967. After graduating at the Belfast Medical School in 1857, William Macormac began his surgical career at the General Hospital in Frederick Street where he continued to work until the Franco-Prussian War of 1870-71 offered him the welcome chance of serving with an international field surgical unit. This was a turning point in his career for in March 1871 he was appointed Assistant Surgeon at St. Thomas's Hospital in London and resigned from his old hospital though maintaining a life-long connection as Consulting Surgeon. He became President of the Royal College of Surgeons and in 1881 was knighted. His particular claim on our interest this morning, and my excuse for this digression, is that this 'extrovert and flamboyant man' was one of the first, and became probably the most influential of British surgeons outside Scotland, to be converted to Listerism. Indeed he published his own findings confirming Lister's claims in 1869, just two years after the original publication. Significantly, in the same year, the Minutes of the Board of Management of the Belfast General Hospital record that he asked for a separate building for surgical patients to avert the fatal disease of pyaemia which had been very prevalent among hospital patients. His request was turned down.

As resistance to the idea collapsed the stage was set for routine surgery in the abdomen free of pain and with dramatically reduced threat to life, at least to that of the patient, for the surgeon's fate was sometimes uncomfortably linked with his results. Any of you with a surgical career in mind can be assured however that, happily, this custom has lapsed. One of the first ovariotomies was performed in 1809 without benefit of either anaesthesia or antisepsis by a redoubtable Kentucky surgeon, one Ephraim McDowell, whose great-grandfather, an Ulster Scot, had at the age of 16 been present inside the walls of Derry during the siege. A legend has persisted that he was attended outside the room where the operation was in progress by a mob proposing to lynch him should his pioneering efforts misfire and the patient die, a sufficiently distracting circumstance to affect adversely the concentration of any latter day surgeons or anaesthetists of my acquaintance, in spite of Dr. Samuel Johnson's well-known views on the matter. Not however of Ephraim, for his patient survived and so, consequently, did he (Schachner, 1921).

Access to the chest cavity for surgery on the lungs, heart and other intra-thoracic structures was not an automatic step from the abdomen since normal functioning of lungs and heart depends on an intact thoracic cage. Although other methods had been used with moderate success, the key to safe, routine access was the development of intermittent positive pressure ventilation, now commonplace in anaesthetic practice and variously adapted in detail to differing clinical needs. Like many other critical innovations this one was derived from, and built on, the observations and discoveries of many previous workers, not all of whom, it is encouraging to note, could claim exceptional academic distinction, and many of whom were unaware at the time of the particular slot in the jig-saw for which their contribution was finally destined. I would like to speak briefly about three such discoveries or developments without any one of which the introduction of this valuable technique would have been delayed, and with it some of the remarkable strides in surgery that have taken place over the past 30 years or more.

The first was the ability to place drugs directly in the blood stream by intravenous injection. Relief for sufferers from neuralgic pain was, to say the least, unreliable by methods available in the early part of the 19th century. Drugs taken by mouth were unpredictable in effect and often poorly tolerated to the point of danger. Scarring or blistering of the skin over an affected nerve so that morphia, when applied, could penetrate more easily, was an ordeal in itself.

Francis Rynd, a surgeon at the Meath Hospital in Dublin, where his likeness still hangs on the wall, was one of the first to devise a more direct way of delivering morphia or other appropriate solution close to the affected nerve. A cannula was inserted either through a small skin puncture or by a solid needle projecting slightly beyond its tip. Having withdrawn the needle the cannula was then attached to a syringe from which the solution flowed by gravity to the selected site. He treated two cases of neuralgia by this method at the Meath in 1844 but was slightly upstaged by Alexander Wood of Edinburgh who, independently and later than Rynd, used much the same method and promptly reported it. The forerunner of syringes as we know them today was introduced by Charles Gabriel Pravaz, formerly an officer in the French Army and later in charge of a home for the aged. He used it, among other things, to inject sclerosing fluid into aneurysms, and it had two important innovations, a plunger and a hollow needle. Sir Christopher Wren, in the intervals between designing St. Paul's Cathedral and many other London churches, used a bladder attached to a quill to inject drugs into dogs, a manoeuvre unlikely to become popular with humans even if the idea had occurred to him. Times have changed. Last year the modern popular plastic descendants of the 'Pravaz' syringe, as easily disposable as excess Colman's Mustard, were used on this hospital campus to the tune of 795,125 syringes and 1,049,380 needles of assorted sizes, shapes and hues. Through them vast amounts of drugs including curare and other anaesthatic agents were pumped directly into the blood stream to reach their point of action quickly and with certainty.

The second and equally important development was endotracheal anaesthesia. In view of the violent response to even a small crumb inhaled accidentally, it was by no means certain, up to the latter part of the 18th century that a tube passed through the mouth and between the vocal cords into the trachea could be safely tolerated. Pierre-Joseph Desault, a distinguished French doctor of the time discovered by chance that this fear was groundless when he accidentally passed a feeding tube intended for the stomach into the trachea, with no adverse response whatever to draw attention to his error until he unwisely tried to pour food through it. To this liberty the patient, now in serious danger of drowning in consommé or other French soup, immediate took violent, involuntary and quite understandable exception. Desault had an even more famous pupil, Francois-Xavier Bichat, who, although he died at the early age of 30, was likened by Macewen of Glasgow to a modern Aristotle. Desault and Bichat in association used the method a number of times for the relief of respiratory obstruction. Napoleon Bonaparte, recognising not only the outstanding value of their work in general, but impressed also by their revolutionary ardour, ordered the erection of a monument at l'hotel Dieu in Paris, and a statue to the memory of Bichat was placed in the Court of the Paris School of Medicine. In one of their cases a man lifted from the pot a potato that was too hot to handle. Perhaps he just did not like waste, for instead of dropping it forthwith – the long established practice with 'hot potatoes' of all types – he unwisely popped it in his mouth and took a deep breath of cool air, thereby effectively lodging it firmly in the opening of his windpipe. Narrowly escaping immediate asphyxiation by an explosive cough, he then developed intense swelling due to the heat of the potato and was only saved from asphyxiation a second time by the prompt intervention of Dr. Desault who with difficulty inserted a tube past the obstruction into the trachea.

One of the first to apply the method to the needs of surgery was William Macewen of Glasgow (Bowman, 1942), a pupil and later a close friend of Lister. Like his teacher he was a man of integrity and great influence. Spencer Wells said of him that he performed work unequalled in originality and value by any surgeon in the world. "A surgeon", he admitted with refreshing humility, "must be a physician first and last; otherwise he is little more than a meddler, an amateur mechanic and often an indifferent one at that". In 1880 he was presented with two patients for removal of tumours at the base of the tongue. Hitherto anaesthesia in such cases had fluctuated between deep, when the risks of obstruction to breathing and aspiration of blood into the lungs were high, and almost awake, when surgery became impossible as anaesthetist and surgeon fought for exclusive access to the mouth. By placing a tube in the trachea, which he did by guiding it through the vocal cords with a finger, and by surrounding it with a pack at the opening of the trachea. Macewen hoped to be able to combine stable, continuous anaesthesia with protection from obstruction to breathing. Because passage of the tube past the growth might be difficult or even impossible, he felt it necessary to test in advance, on the still conscious patients, the feasibility of the manoeuvre, a practice demanding from them a high degree of built-in stoicism, with which quality our forefathers seem to have been singularly well endowed. All went well with the first man, but the second

indicated that he wished the tube removed till he was asleep, a request to which Macewen unwisely acceded for the patient died from asphyxia caused by the growth, one of the dangers the preliminary passage of the tube had been designed to avoid. Having pioneered the method, Macewen, disheartened by this failure, does not seem to have persisted with it.

I suppose no name is more closely linked with the emergence of endotracheal anaesthesia from a performance that was liable to do as much harm as good, into the safe routine procedure that is part and parcel of modern anaesthetic practice than that of Ivan Whiteside Magill of Larne, a graduate of this Medical School. The same difficulties and dangers encountered by Macewen also faced Magill and his colleagues nearly 40 years later at the Queen's Hospital for Face and Jaw injuries at Sidcup in Kent where, on demobilisation from the Royal Army Medical Corps, he found himself working as an anaesthetist in 1919. Essentially a practical man he was able to appreciate the mechanical, technical and, perhaps more intutively than otherwise, the physiological aspects of the problem. To this was added a genius for designing and sometimes making or improvising the prototype endotracheal tubes, laryngoscopes and other necessary ancillary equipment and apparatus. Some of it, more than half a century later, is still preferred to newer designs. As a direct consequence of this work, unhurried, meticulous surgical repair even of the most extensive and disfiguring facial injuries became possible in safety. His interest was later extended to thoracic surgery and here too endobronchial tubes and blockers, bronchoscopes and many other items of equipment and details of technique were soon appearing aimed at making operations on the lungs, with their special problems, safer for the patient, easier for the surgeon, or in some cases possible at all. He was made a Knight Commander of the Victorian Order in 1960 for services to the Royal Family and, now in his 90th year, a few months ago generously presented his many medals and citations to our own Department of Anaesthetics, which 19 years ago he had officially declared open. It was said of Sir Ivan, in 1958, that he had a greater influence than any other man on the remarkable advances in anaesthetic practice in the previous 30 years. An indirect factor in this influence was his proposal in 1931 that a diploma examination in anaesthetics should be established. Although not possible under the constitution of the Royal Society of Medicine to whom he had suggested the idea, this was ultimately done in 1935 under the auspices of the Royal Colleges. Few men in their lifetime have been held in such universal affection and esteem by their professional colleagues at home and abroad, surgeons as well as anaesthetists.

The third factor was the introduction into clinical practice of drugs, in particular curare, used specifically to paralyse muscles. The arrow poison of which it was the active ingredient was a matter of some concern to Sir Walter Raleigh who, referring to an expedition to Guiana, wrote (Raleigh, 1596) "there was nothing whereof I was more curious than to find out the true remedies of their poisoned arrows, for besides the mortalitie of the wound they make, the partie shot endureth the most insufferable torment in the world and abideth a most uglie and lamentable death". Neither bribery nor torture, however, could extract the secret from the Indians. Samples of curare finally reached Europe in 1745

after which a number of studies of its action were made, culminating in those of Brodie and Bancroft, who showed in 1811 that curare killed by paralysing the muscles of respiration, and that artificial respiration could preserve the life of a curarised animal.

At that stage there appeared on the scene one Charles Waterton, who in 1812 undertook the first of his journeys to Guiana with the object of getting samples of the arrow poison from its source. An intense interest in natural history combined with a fearless and eccentric disposition led him to embark with enthusiasm on the South American wanderings for which he is best remembered (Waterton, 1825). A spartan way of life at Walton Hall, his home near Wakefield in Yorkshire was excellent training for the rigours of his adventurous travels. During the last 30 years of his life, after the death of his wife, he is said to have slept on the floor in preference to a bed, with a wooden block as pillow, rising, not surprisingly, at 3.30 each morning. An unwavering faith in the therapeutic efficacy of blood-letting quite set at rest any apprehension about the serious consequences of injury or illness on his travels. By opening a vein in the arm with a scalpel which he always carried he relieved himself of about 20 ounces of blood on at least 160 occasions during his life, sometimes supplementing this therapy with a dose of calomel.

He finally arrived at the habitation of the Macoushi Indians and having obtained a sample of their poison promptly tried it out on an unfortunate dog by wounding it in the thigh. He writes: "In three or four minutes he began to be affected, smelt at every little thing on the ground around him and looked wistfully at the wounded part. Soon after this he staggered, laid himself down and never rose again. He barked once though not as in pain. His voice was low and weak, and in a second attempt it quite failed him. He now put his head betwixt his forelegs and raising it slowly again, he fell over on his side. In aquarter of an hour after he had received the poison he was quite motionless". This account describes exactly what one would expect in the absence of artificial respiration, from an injection of the curare we now use daily in anaesthetised patients, though the latter, so far as I know, lacks the snake-fangs, ants and other miscellaneous ingredients considered necessary by the Indians to achieve satisfactory results. The final product was smeared either on the tip of a small dart for use with a blow-pipe or on a larger arrow used with a conventional bow. The blow-pipe, a remarkable weapon incorporating a sighting device, was lethal for small animals at 100 yards. He tested and dismissed as useless most of the supposed remedies but did advocate a tight ligature proximal to the wound if practicable. An animal which he injected with the poison below a tight bandage showed no ill-effects until, an hour later, the bandage was removed, when, he says, as though disclaiming any responsibility in the matter, "death overtook him" in 10 minutes.

I suppose Waterton's chief claim to our attention is the vivid colour of his personality. He was not, after all, first in the field. Curare had been discovered two centuries before, and inflation of the lungs with a bellows by way of an opening in the wind-pipe had been used in animals by Vesalius in 1543 and

indeed probably as early as the Galenic period. The drug which he sought and tested was subsequently purified, standardised and analysed by other no doubt more gifted but perhaps less colourful workers, and was finally introduced into clinical anaesthesia in 1942.

In 1941 Dr. M. D. Nosworthy published his description of intermittent positive pressure ventilation. When a year later curare became generally available, the combination of easy access to veins, endotracheal anaesthesia, and the ability to produce reversible paralysis of muscles quickly, safely and at will, by curarisation, provided the essential ingredients of a technique which, over the past 35 years, has had a major effect on surgical practice. It has revolutionised surgery on the lungs and heart by overcoming the physiological trespass of the open chest wall, so that even in its presence, normal cardio-respiratory function can now be maintained for quite long periods. Its effects have also been increasingly felt over a wide range of less obvious surgical and medical conditions in which for one reason or another, breathing efficiency has been impaired. In particular the impressive results obtained by Professor Lassen and Dr. Bjorg Ibsen in the disastrous polio epidemic in Denmark a quarter of a century ago brought wide recognition of its clinical value. At one time 70 patients were simultaneously in need of artificial ventilatory support but the Hospital in Copenhagen normally accepting such cases had only seven respirators of old fashioned types. Twenty-seven out of 31 patients in this category admitted in the first month died. Two hundred medical students were then recruited and gainfully employed at 30 shillings for eight-hour spells of manual intermittent inflation of the lungs, by way of a tracheostomy tube, and the mortality immediately fell from 80 per cent to 40 per cent and, by the end of the epidemic, to 23 per cent.

A century and a quarter ago Oliver Wendell Holmes gave to Morton's crucial discover the appropriate title of 'anaesthesia' to denote a reversible state of general insensibility or oblivion during operations. The word, however, contains no hint of the increasingly demanding and complex life-support and other roles of a present-day 'anaesthetist' upon which may depend the re-kindling, or the extinction, of the spark of life in some human being subjected to surgical stresses and demands undreamt of in Morton's day. By establishing strict standards of practice in this, and associated disciplines, the way has been opened to more and more ambitious surgery, first in the abdomen, then in the chest, the brain and the heart. As a spin-off valuable contributions have followed in the treatment of such conditions as poliomyelitis, tetanus and, more recently, severe brain trauma, for which effective therapy was hitherto not always available.

Among the distinguished names I have mentioned are two from this Medical School who, still cloaked in anonymity, may well have dozed through, or perhaps even listened to, some long-dead predecessor on this annual occasion, and I am uncomfortably aware that among you this morning, as yet unidentified, there are those no less well equipped to carry the story still further. May I, in conclusion, return to my original hope that in your endeavours in that direction you will neither allow your disciplinary approach to become de-humanised and insensitive, nor your humanity to degenerate into undisciplined sentimentality. I have called this talk "The Rod and the Staff". Implicit in the title is this dual

responsibility, if you will accept the stretched symbolism of the words. In an increasingly automated and computerised hospital environment, often bewildering, impersonal, even intimidating to the patient, there is also an increasing obligation to offer support, with sensitivity and understanding, at a human, personal level. An early Harveian Orator might have been obliged to put it rather differently: *Ars medica magni momenti est; homo maioris.* It is, I think, a theme as happily embodied in the speciality to which I belong, as in any other.

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MEDICAL UNDERGRADUATE CAREER PREFERENCE ENQUIRY

by

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INTRODUCTION

CHOICE of specialty among medical students and qualified doctors has for some time presented a subject of research in Great Britain and elsewhere. In no other discipline do graduates from a common vocational degree course enter such diverse occupations as, for example, surgery and general practice or psychiatry and laboratory medicine, where the working environment, 'job' content and personal attributes required of the practitioner vary so enormously. The reasons why one doctor should choose to enter community medicine and another anaesthetics have been explored from various standpoints by doctors themselves, by psychologists, sociologists, educationalists and administrators. In recent years a growing concern about the problems within the National Health Service, the number of doctors leaving this country and the difficulty in recruiting staff to shortage specialties has precipitated a number of studies of choice of specialty in England and Scotland. The most comprehensive and detailed study of the determinants of choice of specialty so far undertaken is currently being carried out for the DHSS by the Institute of Manpower Studies at the University of Sussex, with the approval of the British Medical Association. This survey will cover 7,500 qualified doctors.

Little work, however, has been done in this field in Northern Ireland. One of the main functions of the Northern Ireland Council for Postgraduate Medical Education is to provide a careers information and advisory service for recent graduates. This service is limited by a lack of basic information about the factors which influence young doctors in choosing a specialty and deciding in which part of the world they will practise. There is no reliable information available about the career preferences of Queen's medical students; how these preferences may be influenced by academic achievements and home backgrounds or how preferences may change as students are exposed to various specialties and aspects of medical practice during their undergraduate and early postgraduate years. It is often said that only one third of the medical graduates of Queen's remains in the province, one third going to Great Britain and the other third to Canada, the United States and elsewhere in the world. This, however, has been a matter of conjecture as no reliable information is available.

In an attempt, therefore, to obtain a better understanding of the subject, Council has undertaken a twofold survey with the assistance of the Faculty of Medicine. In general terms the objectives of the survey are:

1. To collect information on career preferences and their determinants and the desired location of practice among Queen's medical undergraduates and how far these are or can be fulfilled.

2. To collect information on the chosen specialty and on the destination (transient and permanent) and its determinants of Queen's medical graduates. This paper is an interim report on the first aspect of the study, and includes references, where relevant, to other work done in Great Britain and the United States. A paper concerning the graduate survey will appear at a later date.

METHOD

Since undergraduate preferences and intentions can be expected to change as more experience is gained, a longitudinal study was planned to cover the 1976/77 second, fourth and final year students. It is intended that these three cohorts should be reviewed at two-yearly intervals, their preferences being monitored through postgraduate training to eventual career commitment. It is envisaged that the project should span at least eight years, since previous research has shown that the usefulness of a study of undergraduate career choice alone is limited, the preferences of even final year students having little predictive value, (Last and Stanley, 1968; Last and Brodie, 1970).

The first batch of questionnaires was distributed in May 1977 to 154 second year students, 147 fourth year students and 141 final year students. The number of questionnaires returned were 153, 143 and 138 respectively, giving percentage response rates of 99.4, 97.3 and 97.9 per cent. The questionnaires were distributed to each student at the beginning of a lecture, with an explanation about the purpose of the exercise from the Dean of the medical faculty, which undoubtedly contributed to the pleasing response rate. Those who were absent received their questionnaire by post, with a reminder letter at a later date, where necessary.

The questionnaire covered:

(1) background information (age, sex, marital state, place of residence, subjects taken at 'A' level and grades obtained, and the occupation of parent or guardian.)

(2) current career preferences.

(3) intended place of work, in the long term.

RESULTS

Figures which appear in brackets in the tables represent the preceding number as a percentage of the total, unless stated otherwise.

Background Information

Age

Students who were nineteen on beginning their degree course made up 56.9, 51 and 50.7 per cent in the second, fourth and final year groups. Mature students,

defined as those aged twenty-three years and four months or over on entry numbered only 2, 9 and 6 in the three groups.

Sex

Female medical students represented about one third of the total and appeared to decline progressively in number from final to second year, but the chi squared test indicates that the decrease is not statistically significant ($0.20>p>0.10$).

Marital Status

The large majority of the students were single, though, predictably, the percentage of married students increases towards the final year with 1.3, 7.7 and 18.1 per cent in the three classes.

Place of Permanent Residence

Table I illustrates the place of permanent residence of the respondents. The small percentage of students classified under "elsewhere" came, in descending order of numbers, from various parts of Asia and Africa, from Norway and from North and South America. Although the slight increase in the number of students coming from outside the province in the past few years is not statistically significant, ($0.7>p>0.5$), it is interesting to note, nonetheless, that the political disturbances do not appear to have discouraged students from elsewhere.

TABLE I

PLACE OF PERMANENT RESIDENCE OF RESPONDENTS

Place of permanent residence	*Second year*	*Fourth year*	*Final year*
Northern Ireland	140 (91.5)	132 (92.3)	131 (94.9)
Rest of U.K. and Eire	3 (2.0)	3 (2.1)	1 (0.7)
Elsewhere	10 (6.5)	8 (5.6)	6 (4.3)
Total	153 (100)	143 (100)	138 (100)

Educational Qualifications

The average number of subjects taken at 'A' level per student was 3.4. All had taken the obligatory physics and chemistry either at 'A' level, or, in the case of foreign applicants, at an equivalent level in their own country. The majority had also taken biology and/or maths. Other subjects taken in descending order of frequency were: other maths, (applied, further etc), english and geography, while a very few people in each year took one or two foreign languages, history, art, music, general studies, religious education or zoology. The grades obtained appear to drop a little from 1971 to 1973, then rise again in 1975. At the same time, it must be remembered that 'A' level standards generally have risen in recent years, and that lower grades might not necessarily signify less ability.

It is planned at a later stage in this survey to examine whether there is any correlation between examination results (using results of 'A' levels, the main undergraduate class examinations and finals) and consistency of career preference or choice of specialty.

Social Class

The occupations of the students' parents or guardians were categorized in accordance with the social class classification as defined by the Office of Population Censuses and Surveys in its publication "Classification of Occupations 1970". Table II shows the total number and percentage of students in all three years, grouped by social class, in comparison with the expected number and percentage, as calculated on a proportional basis of the 1971 census figures for Northern Ireland, which are the latest available ones.

TABLE II

SOCIAL CLASS DISTRIBUTION OF RESPONDENTS AND EXPECTED DISTRIBUTION, AS CALCULATED ON A PROPORTIONAL BASIS OF POPULATION AS A WHOLE

Social class	*Actual numbers and percentages*	*Expected numbers and percentages*
I & II	289 (66.6)	89.9 (22.8)
III non-manual	56 (12.9)	63.2 (16.1)
III manual, IV and V (i.e. all manual workers)	49 (11.3)	240.9 (61.2)

Clearly a disproportionately high number of the medical students come from professional homes. Of the 39, 43 and 40 students in second, fourth and final year, respectively, whose parents are categorized as social class I, 14, 18 and 21 had parents who were medical practitioners.

Students' Current Career Preferences

Table III sets out the numbers of students who have definitely decided on a field of medicine in which they wish to make their career; of those who are interested in particular fields of medicine but who are still undecided; of those who have no particular preferences but have decided against certain types of practice; and of those who are completely undecided.

TABLE III

WHETHER DECIDED ABOUT BROAD AREA OF PRACTICE

Whether decided	*Second year*	*Fourth year*	*Final year*
Yes, definitely	7 (4.6)	6 (4.2)	9 (6.5)
Interested in particular fields but undecided	77 (50.3)	89 (62.2)	109 (79)
No, but have decided against certain fields	27 (17.6)	36 (25.2)	17 (12.3)
No, completely undecided	42 (27.5)	12 (8.4)	3 (2.2)

Not surprisingly the proportion of students who have firm preferences (or who claim to have) increases significantly towards final year. This shows up more clearly if the top two lines of figures (i.e. those which indicate a preference: 54.9, 66.4 and 85.5 per cent) are taken in aggregate against the bottom two lines (i.e. those which indicate no preference: 45.1, 33.6 and 14.5 per cent); ($p<0.001$). Previous studies in Great Britain and America have shown, however, that even firm career preferences stated in the undergraduate years are likely to alter. Held and Zimet (1975) found that the majority of even those students who are highly certain about their future change directions. Last and Stanley (1968) concluded that changes of opinion about eventual career are the rule rather than the exception. (See also Zinny and Senturia, 1974). It will be interesting to see in the future stages of this survey whether Queen's students will be any more consistent in their preferences.

Variables influencing Decision Taking on Career Preferences

The data for sex, marital state, maturity and for those with medical parents were analysed in an attempt to ascertain whether these factors have any bearing on the stage at which preferences begin to emerge. However, it must be emphasised that the numbers involved in all of these groups are so small that it would be wrong to base any firm statistical conclusions on them.

It would appear that Queen's female students are no more (or no less) resolute in their career decisions than their male counterparts. Dr Conrad Harris, St Mary's Hospital Medical School, who is currently engaged on the analysis of data gathered in a longitudinal study of the career preferences of 120 students who entered the medical school at Manchester University in 1971 through to qualification in 1976, found otherwise. Preliminary results of his survey showed that, although males and females were equally undecided before the beginning of first year (around 44 per cent of each) a difference had emerged by final year, only 9 per cent of the females being undecided, in comparison to 18 per cent of the males.

It is also apparent that the responsibilities of marriage do not induce earlier career decisions among our sample. Marriage is probably a less urgent influence towards reaching a decision before qualification than after. Stanley and Last (1968) found that more than 63 per cent of married men qualified for one to five years said that they had made a definite decision, whereas only 43 per cent of single men had.

From the data, it could not be assumed that the mature student is ready to commit himself earlier than those who enter straight from school.

When the students whose parents were medical practitioners were isolated as a group, the figures suggest that, although probably better informed about the various career options than the other students, they were no more ready to state firm preferences in second and fourth year ($0.95>p>0.90$ and $0.90>p>0.80$ respectively). In final year, however, more students in this group had made up their minds about the fields of medicine which interested them ($p=0.31$).

Preferences in Broad Areas of Medical Practice.

The next question on the form asked students who had either decided on, or were interested in, a particular field, to list in order of preference six broad areas of medical practice. Medicine, the surgical specialties, obstetrics and gynaecology, paediatrics and psychiatry were grouped under the general heading "Clinical hospital work with continuing responsibility for patients". "Clinical hospital work without continuing responsibility for patients" was used in a broad sense to refer to radiology, anaesthetics and laboratory medicine, although it is acknowledged that these specialties also involve a certain amount of continuing responsibility. The results are given in Table IV.

TABLE IV

GENERAL FIELD OF INTEREST — FIRST PREFERENCE

General field of interest (First preference)	*Second year*	*Fourth year*	*Final year*
General practice	15 (9.8)	28 (19.6)	35 (25.4)
Clinical hospital work with continuing responsibility	58 (37.9)	58 (40.6)	69 (50)
Clinical hospital work without continuing responsibility	2 (1.3)	2 (1.4)	5 (3.6)
Academic medicine and research	4 (2.6)	2 (1.4)	3 (2.2)
Community medicine	4 (2.6)	2 (1.4)	2 (1.4)
Others	1 (0.7)	3 (2.1)	4 (2.9)
Total number who stated first preference	84 (54.9)	95 (66.4)	118 (85.5)

(In the above and following tables in this section, the percentages quoted are based on the total number of students in each year, not on the number stating a preference.)

The majority are in terested in clinical hospital work with continuing responsibility and interest in this area grows towards final year. Second most popular is general practice, interest in this field also increasing towards final year. Relatively few students indicate a preference for clinical hospital work without continuing responsibility, academic medicine and research, community medicine or others. Many feel that this pattern is almost inevitable given the present emphasis on these fields in the undergraduate curriculum. It has been suggested that more medical graduates might be attracted to specialties which have found difficulty in recruiting in recent years, for instance, radiology, laboratory medicine and community medicine, if they are exposed to them more during undergraduate training.

Students were then asked to indicate a second choice (Table V). General practice emerges as the most popular second preference, and more students are

willing to consider as a second choice the fields which scored so little on first preference.

TABLE V

GENERAL FIELD OF INTEREST — SECOND CHOICE

General field of interest (Second choice)	*Second year*	*Fourth year*	*Final year*
General practice	32 (20.9)	36 (25.2)	42 (30.4)
Clinical hospital work with continuing responsibility	13 (8.5)	28 (19.6)	32 (23.2)
Clinical hospital work without continuing responsibility	10 (6.5)	11 (7.7)	14 (14.5)
Academic medicine and research	11 (7.2)	9 (6.3)	6 (4.3)
Community medicine	9 (5.9)	6 (4.2)	4 (2.9)
Others	3 (2.0)	2 (1.4)	2 (1.4)
Total number with second preference	78 (51.0)	92 (64.3)	106 (76.8)

A declining number indicated a third choice (Table VI). Community medicine loses in favour of clinical hospital work without continuing responsibility after second year.

TABLE VI

GENERAL FIELD OF INTEREST — THIRD CHOICE

General field of Interest (Third choice)	*Second year*	*Fourth year*	*Final year*
General practice	13 (8.5)	16 (11.2)	18 (13.0)
Clinical hospital work with continuing responsibility	3 (2.0)	4 (2.8)	4 (2.9)
Clinical hospital work without continuing responsibility	12 (7.8)	24 (16.8)	29 (21.0)
Academic medicine and research	5 (3.3)	11 (7.7)	10 (7.2)
Community medicine	14 (9.2)	10 (7.0)	6 (4.3)
Others	1 (0.7)	2 (1.4)	1 (0.7)
Total number with third preference	48 (31.0)	67 (46.9)	68 (49.3)

Preferences for Specific Specialties

The next question on the form invited students who had a preference for a broad area of practice to be more specific, if they wished, listing up to three specialties, in order of preference, from a given list. (Table VII)

TABLE VII

DETAILED PREFERENCES — FIRST, SECOND AND THIRD CHOICE

Specialty	*Second year choices*			*Fourth year choices*			*Final year choices*		
	1	2	3	1	2	3	1	2	3
Academic medicine & research	3	2	3	2	5	3	4	1	3
Anaesthetics	0	1	3	1	8	7	3	10	8
Community medicine	2	2	5	2	2	6	2	4	2
General practice	11	6	10	25	15	17	33	17	18
Medicine	9	10	6	17	21	10	28	22	11
Laboratory medicine	0	1	0	0	0	3	1	1	1
Obstetrics & gynaecology	9	9	6	3	5	9	9	19	6
Ophthalmology	0	3	0	0	2	2	0	2	3
Otolaryngology	0	1	0	0	0	0	0	3	3
Paediatrics	5	10	6	8	16	6	10	14	18
Psychiatry	5	5	1	2	3	6	5	4	6
Radiology & radiotherapy	1	,1	1	1	0	3	1	2	5
Surgery	16	9	6	28	10	6	16	12	8
Others	3	1	0	2	2	1	3	0	2
Total with first, second or third choice	64	61	47	91	89	79	115	111	94

Surgery is the most popular first choice in second year (10.5 per cent) followed by general practice (7.2 per cent), then medicine and obstetrics and gynaecology (each 5.9 per cent). Medicine, paediatrics, obstetrics and gynaecology and surgery receive most interest (all around 6 per cent) as second choices, and even as third choice none of the other specialties figure much. Surgery remains the most popular first choice in fourth year, again followed by general practice and medicine (19.6, 17.5 and 11.9 per cent). Medicine, paediatrics and general practice (14.7, 11.2 and 10.5 per cent) were the most commonly quoted second choices. A few more people at this stage have started to consider academic medicine and research, anaesthetics, community medicine, laboratory medicine, aphthalmology, psychiatry, radiology and radiotherapy as second or third options, but the numbers remain small.

The distribution of preferences between hospital specialties and general practice in second and fourth year does not accord with the ratio of the numbers holding career posts in these two broad areas in Northern Ireland at the moment. In May 1978, there were a total of 573 career posts in hospital medicine (484 consultant and 89 medical assistant posts) and 736 in general practice (i.e. principal posts). However, the preferences of the final year students appear

more tempered by realism, general practice emerging as the most popular first choice, and medicine as second (23.9 and 20.3 per cent). Surgery, traditionally the most competitive specialty, drops to third and paediatrics is fourth (11.6 and 7.2 per cent). Medicine, obstetrics and gynaecology, general practice and paediatrics (15.9, 13.8, 12.3 and 10.1 per cent) receive most attention as second options. A few more people are prepared to consider otolaryngology as a second or third option, but on the whole the students remain biased in the direction of two or three mainstream hospital specialties, and general practice.

Their preferences are actually very similar to those of other newly qualified doctors elsewhere in Britain. In their study of all 2348 pre-registration doctors who had graduated from medical schools in England, Scotland and Wales in 1974, Parkhouse and McLaughlin (1976) also found that general practice, medicine, surgery and paediatrics (32.9, 22.5, 15.9 and 6.4 per cent) were the most quoted first choice preferences. Queen's final year students differ, however, from the national pattern indicated by Parkhouse and McLaughlin in that a sizeable proportion (13.8 per cent) were considering obstetrics and gynaecology as a second choice, as compared to 5.7 per cent of the latter group. One might possibly attribute this to a difference in emphasis in the undergraduate curriculum, or to the influence of the teaching staff in obstetrics and gynaecology at Queen's.

Variables influencing Decisions on General and Specific Fields of Medical Practice

As before, data on the broad and specific fields of medical practice as influenced by sex, marital status or a doctor parent must be interpreted with caution as the numbers are very small.

In second, fourth and final year, the distribution of male and female preferences is largely similar, general practice being second in popularity to clinical hospital work with continuing responsibility. A slightly higher proportion of women were attracted to general practice in final year. One might have hypothesised that more women, in anticipation of future domestic commitments, might have been interested in clinical hospital work without continuing responsibility: however, this is not the case. A few more women than men in second year were interested in community medicine, a field which, given the more regular hours and the nature of the work, might be also regarded as more compatible with domestic commitments. Female interest in community medicine however, waned after second year, while a few more men expressed an interest. The detailed specialty preferences reflect, of course, the general fields of interest, general practice, the second most popular male choice is second and fourth year (9.1 and 17.9 per cent), being less favoured by female students (2.3 and 16.7 per cent). However, as shown previously, female interest in general practice exceeds that of the male students in final year (30.2 as opposed to 20 per cent).

The specialties where the choice of male and female students differ most consistently and strikingly from second to final year are surgery and paediatrics. Surgery, one of the most popular specialties with the male students (13.6, 25.3 and 14.1 per cent), does not attract even half as many females (2.3, 8.3 and 7.5

per cent). This lack of female interest in surgery could possibly be attributed to the competition for surgical posts and the long intensive training which does not lend itself to interruption or part-time work. Or one might postulate that it is not so much the job conditions as the episodic nature of the work and the technical skills involved which appeal less to women. Again from the traditionally accepted viewpoint of the respective rules of male and female in society generally, it is not unnatural, perhaps, that more women students than men should be drawn towards work with children, the female percentage for paediatrics being 9.3, 12.5 and 15.1 per cent as compared with the male figures 0.9, 2.1 and 2.4 per cent. If one might draw any conclusions from the small numbers involved in our own survey and from the findings of other researchers, it would appear that the sex of the medical student does influence his/her career preferences. The female undergraduates in our sample appear to be drawn to certain areas of practice as a result of their innate personal attributes or aptitudes and seem little influenced at this stage by the fact that other fields might offer conditions more compatible with domestic responsibilities. This is probably natural as many of the girls may have no immediate plans for marriage, yet we know from the law of averages that most of them will marry eventually and be forced to make compromises in their career.

The findings of the A.S.M.E. survey (Royal Commission on Medical Education, 1968) were similar to ours in that more women students preferred general practice and paediatrics and fewer chose surgery, although, in contrast to our group, more women also chose community medicine. Studies of the occupations of qualified woman doctors, however, reveal a somewhat different pattern. Stanley and Last (1968) noted that "women, on the whole inclined towards careers either outside hospital or in specialties within the hospital system that were less demanding in terms of clinical responsibility". Scottish Council's survey (1977) of doctors who had qualified seven and twelve years previously likewise showed that more women preferred general practice than other types of work and that the next most preferred area was family planning/child health. Research done in the United States (Kosa & Coker, 1965; Phelps, 1968; Westling-Wikstrand et al, 1970; Shapiro et al, 1968; Powers et al, 1969) confirms this pattern which is probably due in both countries to the resistance in hospitals to more flexible working hours and part-time training, and to the lack of provision for child care.

While it would be unrealistic to generalise on the basis of the very small numbers involved in this survey it would appear that marital state has little bearing on career preference, at least during the undergraduate years. Analysis of our data showed no correlation between general fields of interest or specific specialty preferences and marital state. Previous research with postgraduates, however, leads to the somewhat unexpected conclusion that more married male as well as female doctors tend to follow a career outside the hospital, or, if inside, in specialties not involving continuing clinical responsibility. (Stanley and Last, 1968; Flynn and Gardner 1969).

General fields of interest as expressed by those with a medical practitioner parent were compared with those of other students who have no medical

practitioner parent. Clinical hospital work with continuing responsibility still dominates as the most popular choice with both groups: 21 out of the 39 with doctor parents who answered this question and 164 of 258 with no doctor parent made it their first choice. A higher proportion of students with a doctor parent (15 of 39) gave general practice as their first choice (as compared with 63 of 258 with no doctor parent). When the more detailed preferences of the same two groups are compared, general practice ranks equal with medicine as first choice in second and fourth year among students with a doctor parent, while for those without a doctor parent, general practice is second most popular, rating some way behind surgery. By final year, general practice emerges clearly as the most popular specliality with both lots (7 of 20 with doctor parents and 26 of 95 with non-doctor parents making it their first choice). Surgery, the most popular specialty with non-doctor-parent students in second and fourth year, and third most popular specialty in final year, receives less interest from those with a doctor parent. These variations might possibly be attributed to a greater awareness of the relative availability of career posts in general practice and surgery among students with doctor parents. Another possible interpretation is that offered by Kritzer and Zimet (1967) who found a negative correlation between the socioconomic status of the fathers of their subjects, and the specialties they chose. Demonstrating that the fathers' occupational level was considerably lower for surgeons than for other specialty groups, they hypothesised that another, possibly unconscious, influence in a student's specialty selection is his past life situation and the need for prestige. As a group the students in our survey with a doctor parent are no more willing than the other students to consider a career in any of the shortage specialties.

Types of Work and Specialties decided against

The next question on the form asked those who had stated earlier that they had decided *against* certain broad areas of practice to indicate these fields on a given list, (27 in second, 36 in fourth and 17 in final year).

TABLE VIII

TYPES OF WORK DECIDED AGAINST

Type of work decided against	*Second year*	*Fourth year*	*Final year*
General practice	21 (13.7)	16 (11.2)	14 (10.1)
Clinical hospital work with continuing responsibility	1 (0.7)	2 (1.4)	5 (3.6)
Clinical hospital work without continuing responsibility	33 (21.6)	51 (35.7)	55 (39.9)
Academic medicine and research	40 (26.1)	72 (50.3)	74 (53.6)
Community medicine	24 (15.7)	72 (50.3)	94 (68.1)
Others	0	1 (0.7)	4 (2.9)

The percentages for clinical work without continuing responsibility ($0.01>p>0.001$), academic medicine and research ($p<0.001$) and community medicine ($p<0.001$) are all statistically significant. The reasons why an increasing number of students should rule out these fields of practice before qualification would appear a fruitful subject for investigation. The commonly accepted explanation is not that there are factors influencing the student against, but rather, that there is a lack of factors influencing him in favour of these areas of practice as he progresses through medical school. In other words, the areas which decrease in popularity are those which are accorded less priority on the undergraduate timetable. That there are other contributing factors seems likely: it is difficult to avoid the conclusion that certain specialties hold less interest intrinsically for the medical student from the outset of his studies through to qualification and specialisation. Why this should be so has not been sufficiently explored by researchers.

The figures in table IX show that the specialties most frequently dismissed by the final year students are laboratory medicine and community medicine, two of the specialties which suffer the most acute staffing shortages.

TABLE IX

SPECIALTIES DECIDED AGAINST

Specialties decided against	*Second year*	*Fourth year*	*Final year*
Academic medicine and research	35 (22.9)	70 (49)	67 (48.6)
Anaesthetics	20 (13.1)	41 (28.7)	49 (35.5)
Community medicine	21 (13.7)	60 (42)	86 (62.3)
General practice	19 (12.4)	13 (9.1)	12 (8.7)
Medicine	1 (0.7)	8 (5.6)	8 (5.8)
Laboratory medicine	46 (30.1)	73 (51)	101 (73.2)
Obstetrics and gynaecology	2 (1.3)	8 (5.6)	35 (25.4)
Ophthalmology	6 (3.9)	16 (11.2)	49 (35.5)
Otolaryngology	6 (3.9)	18 (12.6)	70 (50.7)
Paediatrics	2 (1.3)	4 (2.8)	20 (14.5)
Psychiatry	21 (13.7)	53 (37.1)	47 (34.1)
Radiology/radiotherapy	16 (10.5)	40 (28)	64 (46.4)
Surgery	9 (5.9)	12 (8.4)	28 (20.3)
Others	0	1 (0.7)	2 (1.4)

Intended Location of Practice

Table X summarises the intentions about location of practice and includes, in brackets, the numbers of students originating from Northern Ireland, the rest of the United Kingdom and Eire, and from elsewhere. Clearly the two sets of figures must be taken in conjunction when interpreting the emigration figures, since it is natural that students from outside Northern Ireland might wish to return to their place of origin.

TABLE X

INTENDED LOCATION OF PRACTICE

Intended location of practice	*Second year*	*Fourth year*	*Final year*
Northern Ireland	41 (140)	48 (132)	59 (131)
Rest of U.K. & Eire	8 (3)	15 (3)	14 (1)
Elsewhere	22 (10)	30 (8)	14 (6)
No strong feelings	82	50	51
Total	153	143	138

The continents/countries specified by those intending to emigrate were Canada and the United States, Australia and New Zealand, Western Europe, South America, Africa and Asia, in descending order of popularity, while a few people in each year stated simply that they intended to work abroad. It is inappropriate to draw firm conclusions about this question because of the very high percentage of students who are still undecided (53.6, 35 and 37 per cent in second, fourth and final year) but the figures do not look encouraging from the standpoint of the health services in Northern Ireland. Less than half the final year students feel committed to working here, and it is likely that the proportion remaining here, in the long term, will be even less.

Although our figures cannot be compared directly with those quoted by Parkhouse and McLaughlin (1976) from their study of the 1975 pre-registration doctors in Great Britain mentioned previously since their question on intended location of practice was worded differently, it is obvious that fewer of the pre-registration doctors in Great Britain wished to leave the country. Asked whether they intended to practise permanently in the United Kingdom, 32 per cent said "definitely yes", another 49.9 per cent said "probably yes", 7.5 per cent said "probably no", and only 2.5 per cent said "definitely not". A further 7.7 per cent were undecided. Parkhouse and Palmer (1977) did a similar survey on the 1976 pre-registration doctors, this time including Queen's medical graduates and, for the first time, Nottingham. Their findings from the second study showed no evidence of any increasing inclination to emigrate.

Returning to our own survey, about 12, 25 and 16 per cent of the second, fourth and final year students who originate from Northern Ireland are, at this stage, intent on leaving. If the preferred places of practice are divided into what might generally be accepted as developed countries and underdeveloped or developing countries, the results are as follows. Approximately 13 second year, 23 fourth year and 17 final year students plan to go to developed countries, whereas no second year students are interested in the under-developed or developing countries, and only about 7 fourth year and 3 final year students are. It would appear, then, that the chief motivating factors behind emigration for this group relate to professional advancement, good working facilities and higher financial rewards. Four of those who are still uncommitted claimed that any decision to leave the province would depend almost entirely on our political

stability. It is hoped that more relevant information will emerge in the follow-up studies, and that the postgraduate survey currently under way will throw some light on the reasons for emigration.

Specific Comments made by Respondents

Comments did not vary a great deal among the three cohorts, most of them falling into one of a few broad categories. Predictably, most of the comments (about 15) from second year were to the effect that it was much too early to say what one wanted to do, having had little exposure to the range of possibilities. Another eight expanded on their career preferences or the reasons for their choice and three commented on their intended place of work, e.g. reasons for wishing to leave Northern Ireland. A few people who wished to go to North America realised they might have difficulty in obtaining work permits/visas. The questionnaire seemed to arouse most interest, and certainly most comment, from the fourth year students. About 20 observed that they would feel in a better position to answer the questionnaire in final year, after they had benefitted from more attachments to the various specialties. Seven enlarged on career preferences and four on intended place of practice. Only six students in final year felt moved to make any comment — three enlarging on their career preferences and three noting that it was very difficult at this stage to decide.

DISCUSSION

The most striking fact which emerges from the figures concerning career preferences is the discrepancy between the students' ambitions and potential openings in the health services. While we know from experience and previous research that these preferences will change, we know also from experience that the discrepancy will remain.

A paper produced earlier this year by the Department of Health and Social Services (N.I.), entitled "Career opportunities in medicine in Northern Ireland", suggests that, in choice of career among newly qualified doctors, insufficient emphasis is given to the prospect of obtaining a career post on completion of training. Obviously, the more popular a hospital specialty is, the greater the competition for consultant posts. The paper comments on career prospects in the various hospital specialties, general practice and community medicine, and includes tables estimating consultant requirements to December 1982, calculated by summing anticipated wastage (due to retirements, deaths and emigration), and the number of doctors required to provide for recommended growth and fill established vacant posts.

The following broad classification of career prospects in the different specialties is taken directly from the Department's paper.

Specialties with outstanding career prospects

Geriatrics
Laboratory medicine
Radiology

Specialties with better than average career prospects

Otolaryngology
Psychiatry (including special care)

Specialties with average career prospects

Anaesthetics — prospects could become less certain if the present high emigration rate in the specialty significantly decreased.

Medical specialties (excepting geriatrics) — prospects could be less favourable in some of the small sub-specialties.

Specialties with less certain career prospects

Obstetrics and gynaecology
Ophthalmology
Surgical specialties — of the sub-specialties prospects in orthopaedic surgery would appear to be the best.

General practice

Career prospects . . . are likely to be good for the foreseeable future.

Community medicine

. . . Career prospects in this specialty are currently outstanding.

The Department's paper provides information which should clearly be of interest to all medical students and young doctors who are undecided about choice of specialty.

It is obvious, however, that career decisions in medicine, as in all other walks of life, are not based purely, or primarily, on such logical considerations as career prospects. Two sociologists, Malcolm Johnston and Mary Ann Elston (Nuffield Centre for Health Services Studies, University of Leeds), are at present working on the report of a study of the career development of seven hundred 1954 and 1964 medical graduates from five British medical schools, which examines not only "work careers" but other major life events such as marriage and family, and important non-work activities such as involvement in sport, politics, etc., (which they class as "sub-careers".) Their study is concerned with "biographies", this approach being essential, in their estimation, to the understanding of personal decision-making, preferences and priorities.

Rosemary Hutt, who is heading the research team at the Institute of Manpower Studies on the previously mentioned survey, published a most interesting and comprehensive paper in 1976, entitled "Doctors' Career Choice: previous research and its relevance for policy-making". In her introduction, she sees the main factors which interact to determine choice of specialty as follows:

(a) Background factors

(Sex, parental occupation, social background, nationality and marital state — i.e. the aspects covered by this survey).

(b) Personality and attitude factors

e.g. Attitudes towards patients, death, problem-solving, team-work, decision-making and exercise of authority.

(c) Factors relating to the educational system

e.g. School record, careers advice, the selection system, examination performance and medical training.

(d) Career factors

e.g. Pay, promotion prospects, the possibilities of emigrating, opportunities for private practice and prestige.

(e) Working conditions

e.g. Area of residence, type of hospital, facilities available, length of working day, regularity of hours and effects on family life.

(f) Intrinsic differences between the specialties themselves

e.g. Amount of patient contact, the extent to which they are research or science-orientated, their relative "success" rates in terms of curing, the skills they require, and the kinds of satisfaction, social or intellectual, to be derived from them.

Considering the imbalance of staff between the specialties, Rosemary Hutt suggests that, of the above, career factors and working conditions are the influences which can most easily be changed if the manpower situation demands it. She is of the opinion that, while it might theoretically be possible for medical schools to accept relatively more students with personality characteristics and personal backgrounds of a kind which increased the likelihood of their choosing particular specialties, it is unlikely that this would be acceptable in practice. On the other hand, she argues, a change in relative pay or conditions or in the educational system, could, though not always easily, be brought about.

Another school of thought has been advanced by Dr Julian Tudor Hart, a general practitioner in Glamorgan (1974), who points to the very large proportion of the medical school population coming from professional and executive classes (two-thirds, in our sample). It is natural, perhaps, that students from social classes I and II should be motivated by social status, professional advancement and expectations of a good income, as well as altruistic factors. It is hardly surprising, then, that many of our doctors gravitate towards the large teaching centres and the more desirable parts of the country, socially and geographically, or that many emigrate as a result of dissatisfaction with working conditions and levels of remuneration in the United Kingdom. Dr. Hart suggests that, if 20 per cent of the annual intake of medical students were reserved for N.H.S. workers of three or more years standing, a stronger element of vocational commitment might be established in the medical profession and our present staffing problems eased a little.

The researchers quoted in this section represent widely differing approaches and theories for improving distribution of staff within the medical profession.

Obviously a better understanding of the factors which influence doctors' career decisions is essential before any changes in policy can be made. The results of Rosemary Hutt's major study and of the Johnston/Elston survey should contribute a great deal to the subject.

SUMMARY

Questionnaires were distributed in May 1977 to 154 second year, 147 fourth year and 141 final year medical students in the first stage of a longitudinal survey concerning the factors which influence choice of specialty and place chosen for practice by Queen's medical graduates. There was an average response rate of 98.2 per cent. As expected, the proportion of students with, or claiming to have, firm career preferences rose significantly towards final year.

The sex, age or marital state of the student did not appear to affect the firmness of his/her career decision, but a greater number of those with a medical parent had made a positive decision by final year.

When asked to list in order of preference six broad areas of medical practice, the majority ranked clinical hospital work with continuing responsibility as first choice, and second most popular was general practice, interest in both these fields increasing towards final year. On a more detailed list of specialties, surgery, general practice and medicine (in that order) were the most popular first choices of second and fourth year students but in final year the order changed to general practice, medicine and surgery. Few students in any year were prepared to consider the shortage specialties, laboratory medicine, radiology, community medicine and psychiatry.

The sex of the student was found to influence his/her choice of specialty. Speaking in terms of percentage throughout this paragraph, surgery attracted an average of three times as many males as females and paediatrics attracted an average of seven times as many females as males. Marital state appeared to have no influence on choice of specialty. Students with a medical parent differed from the others in that a higher percentage of them were interested in general practice, and only an average of one third as many were interested in surgery.

The percentages of students deciding against any form of work in hospital without continuing clinical responsibility, academic medicine and research or community medicine rose significantly towards the final year. In the detailed list of specialties, the percentage deciding against academic medicine and research, anaesthetics, community medicine, laboratory medicine, obstetrics and gynaecology, ophthalmology, otoloryngology, paediatrics, radiology/radiotherapy and surgery all rose significantly. The specialties dismissed most by the final year students were laboratory medicine and community medicine, two of the specialties which suffer the most acute shortages.

Under 40 per cent of the students felt committed to working in Northern Ireland and it is likely that, in the long term, the proportion remaining here will

be even less. Including foreign students, 18 per cent are intent on leaving, the desired location of practice for the majority being developed countries outside the United Kingdom. The few who commented on their decision to leave gave as a reason either pay, tax and working conditions or the political situation in Northern Ireland.

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ULNAR NERVE ENTRAPMENT AT THE WRIST

by

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MEDIAN nerve compression at the wrist is common and its treatment by decompression is usually successful. Ulnar nerve entrapment, on the other hand, is uncommon.

The ulnar nerve as it enters the hand passes through and divides in the canal of Guyon, into its deep (motor) and superficial (sensory) branch. This ulnar-carpal tunnel is bounded proximally and medially by the pisiform, distally and laterally by the hook of hamate, anteriorly by the volar carpal ligament and posteriorly by a thick carpal ligament overlying the pisotriquetrial articulation. Proximal to the wrist the ulnar nerve gives off its dorsal cutaneous branch.

Two cases of ulnar nerve entrapment at the wrist are described.

Case 1

A 35-year-old lorry driver complained of clumsiness, burning pain and weakness in his left hand. This had developed over several months and there was no history of injury. The pain affected the ring and little fingers.

Examination revealed wasting of the small muscles of the hand except the thenar muscles, and there was clawing and abduction of the little finger. There was no sensory loss but percussion of the ulnar nerve at the wrist caused tingling in the ring and little finger. Clinical and radiological examination were normal.

A clinical diagnosis of ulnar nerve compression at the wrist was made and this was confirmed by nerve conduction studies, which showed evidence of lower motor neuron denervation in the muscles supplied by the deep branch of the ulnar nerve and that the level of the lesion was at the wrist. Eight weeks later he complained that his hand had become very weak and he experienced altered sensation in his ring and little fingers.

At operation the ulnar nerve was explored in the ulnar carpal canal. Proximal to the bifurcation of the nerve there was a firm swelling. On careful dissection this proved to be a ganglion arising from the thenar aspect of the carpal joint, over which the ulnar nerve was stretched. The ganglion was excised.

There was immediate subjective improvement with relief of pain in the ring and little fingers. Four weeks later there was no sensory deficit and the patient felt his hand was stronger. After seven weeks EMG showed evidence of reinnervation of adductor pollicis with a response in the muscle on stimulation of the ulnar nerve above the wrist.

Case 2

A 48-year-old builder complained that over the course of a day his left little and ring fingers became flexed and he was unable to extend them actively.

Movement returned to the fingers but was followed by a generalised weakness in the hand for fine movements.

When first seen at out-patients there was motor weakness of the ulnar innervated muscles of the hand and marked wasting of the first dorsal interosseous muscle, but no sensory abnormality. There was no history of injury and examination of the rest of the arm was normal. A clinical diagnosis of entrapment of the deep branch of the ulnar nerve was made and confirmed by nerve conduction studies which showed a delay for the wrist latency value of the left ulnar nerve, particularly that of the funiculi to adductor pollicis.

At operation the deep branch of the ulnar nerve was found to be compressed by a tight band which arched over the nerve from the pisiform to the hook of hamate. There was no ganglion.

By the tenth post-operative day the patient noticed that his hand was regaining strength. Nerve conduction studies fourteen weeks after the operation showed a normal EMG picture in the adductor pollicis muscle and the wrist latency for the deep branch of the ulnar nerve had diminished from the previous 7.6m secs. to 4.8m secs. Clinically there was excellent functional recovery.

DISCUSSION

Occupation neuritis of the deep branch of the ulnar nerve was first reported by Hunt (1908). Seddon (1952) described carpal ganglion as a cause of paralysis of the deep branch of the ulnar nerve. The importance of recognising trauma as a precipitating factor in a nerve already being compressed by a ganglion was pointed out by Seddon (1952) and Vanderpool *et al* (1968). Hayes *et al* (1969) described a ligamentous band which bridges over the deep branch of the ulnar nerve from the pisiform to the hook of hamate, so rendering the deep branch more liable to compression by a ganglion. Jeffrey (1971) described compression of the deep branch by an anomalous muscle. McFarland *et al* (1971) reported a case of lipoma causing compression of the motor branch of the ulnar nerve.

Shea and McClain (1969) tabulated 136 cases of ulnar nerve compression at and below the wrist and listed them under 19 causative lesions. Ganglia were present in 39 cases and occupational neuritis in a further 32 cases, these two aetiological factors accounting for 52.2 per cent of the total number tabulated. These authors also introduced a useful classification of the entrapment syndrome. Type 1 causes motor and sensory symptoms due to a lesion proximal to the bifurcation of the ulnar nerve. Normal sensation on the medial side of the dorsum of the hand indicates that the dorsal cutaneous branch of the ulnar nerve is spared. In Type 2 sensation is normal but there is motor weakness due to pressure on the deep branch. In Type 3 there is involvement of the superficial branch alone, with sparing of the motor branch, causing sensory deficit on the volar surface of the hypothenar eminence and in the ring and little fingers.

These two reported cases are examples of Type 1 and Type 2 lesions.

SUMMARY

Two cases of ulnar nerve entrapment at the wrist are described. In the first case the main trunk of the nerve was compressed by a ganglion in the ulnar carpal canal, and in the second, the deep branch was entrapped by a tendinous band as it left the canal. In both cases there was a complete clinical recovery and this was confirmed by post-operative nerve conduction studies.

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GLIPIZIDE EVALUATION AFTER A ONE YEAR TRIAL IN MATURITY ONSET DIABETICS

by

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Key words : Glipizide, Oral hypoglycaemic agents, Diabetes Mellitus

GLIPIZIDE, a sulphonyl-cyclohexylurea derivative, was introduced in 1971. It was found to be a hypolycaemic of great potency, short action and low toxicity. This report is concerned with the results following treatment for one year with the drug in a diabetic clinic in Belfast. The study particularly examined the effect of the drug on patients of differing degrees of obesity and also examined the effect of the drug in patients who had been on previous sulphonylurea therapy.

PATIENTS AND METHODS

Diabetics admitted to this study were patients in whom the disease was discovered after the age of 40 and who were not ketotic. All were treated as out-patients and continued their usual life. Details of the population studied are shown in Table I. Patients not on previous therapy were only admitted to the

TABLE I

59 patients Age 59.9±10.4 (Mean±SD) Percent ideal weight 113.7±21.2
Previous therapy 16
No previous therapy 32

	Per cent Ideal Wt.	*Age*	*No.*
Gross Obesity	>130	59.6± 7.5	13
Obese	111 – 130	60.3±10.4	17
Normal	91 – 110	61.9±11.5	18
Underweight	>91	56.0± 7.6	4

study if 3 months of dietary treatment failed to produce a satisfactory reduction in blood glucose. Glipizide was given as a single dose of 5-10 mgs and if increased to 15-20 mgs daily was then given in divided doses. Patients were given dietary advice appropriate for their degree of obesity. Measurements of blood glucose were made on fasting and two hour postprandial blood samples. Weights were converted to percentage ideal weight from the normals of the Metropolitan Life Insurance Tables. All patients were asked about possible side effects of the drug.

RESULTS

The blood glucose values in the various groups before and after treatment are shown in Table II. At one year there was a significant fall in both fasting

TABLE II

	FASTING		POST PRANDIAL	
	Initial	1 *year*	*Initial*	1 *year*
Total	13.4±4	8.8±3.3***	17.4±5.4	12.0±4 ***
Previous therapy	12.6±4.3	9.1±3.7**	16.2±4.7	12.2±3.6**
No previous therapy	13.6±3.8	8.7±3 ***	18.1±5.6	11.6±4.3***
Gross obesity	14.4±3.8	10.1±3.6**	16.7±7.3	12.3±4.7**
Obese	13.0±3.8	9.2±3.3**	15.9±4.9	12.4±4.3**
Normal	12.5±3.7	7.4±3.4***	18.9±7.3	11.1±4.8***
Underweight	13.8±4.5	10.6±8.3*	17.8±5.7	14.3±1.4*

Fasting and postprandial blood glucose levels before and 1 year after treatment with glipizide

*$p<.05$ **$p<.01$ ***$p<.001$

and postprandial glucose in all groups. The initial blood glucose values in all groups were similar and the responses were not significantly different in each group although numbers were small. Of particular note is that fact that treatment with glipizide produced a significant fall in blood glucose in those whose previous treatment with Sulphonylureas had not been satisfactory. No significant change in weight was noted and there was no individual correlation between the improvement in blood glucose and weight change. The average dose of glipizide used was 11 mgs and no significant side effects were noted.

DISCUSSION

The controversy regarding the relationship of control of blood glucose to the development of microvascular complications still continues. Nevertheless, the evidence has been interpreted as suggesting that complications are reduced if blood glucose control can be improved (Cahill et al 1976). Microvascular complications are problems both in juvenile and maturity onset patients. While dietary treatment may achieve normal glucose tolerance in many maturity onset patients a significant number lack the discipline and motivation required for the success of this regime. Our study demonstrates that glipizide, a second generation sulphonylurea significantly lowers blood glucose levels. As many of these patients had failed to improve on dietary treatment alone it is unlikely that the decrease in blood glucose could be explained by dietary compliance over the year of glipizide treatment. That improved dietary compliance is improbable is also suggested by the fact that no group lost weight over the period of study. Our patients had no significant side effects. The study thus confirms the evidence of previous trials on the efficacy of glipizide. A preliminary multicentre trial on

1064 diabetic patients reported by Emanueli et al 1972 showed it to give favourable control in 80 per cent of maturity onset diabetics when used in doses of 2.5 mgs. It was considered to have equivalent activity to glibenclamide. A further multicentre trial co-ordinated by Lahon and Mann (1973) was performed on 177 maturity onset diabetics to compare glipizide with glibenclamide, chlorpropamide and phenformin. Little difference between the efficacy of the various compounds was seen. Side effects were minimal with glipizide and the doses used with safety were increased to 30 mg/day.

Pharmacological studies summarized by Artini et al (1973), Tomassia (1975), Domingo-Gutierrez and Fernandez-Cruz (1975) show that glipizide, unlike glibenclamide is rapidly absorbed and produces an early insulin release at 30-60 min returning to basal levels by 90 min. It would be reasonable to conclude that clinical experience with the two drugs might be different; whereas glibenclamide could be given in one dose daily, glipizide might need divided dosage. Under clinical conditions the experience of Person (1973) in 19 patients, was that in patients requiring 10 mg or less of glipizide per day the drug could be given in one morning dose, whereas a daily dose of over 10mg was given in two doses morning and evening. Our practical experience was similar. Long-term results over a four year period on 72 patients formed the basis of the conclusion of Perodi and Caputo (1975) that the hypoglycaemic action of glipizide did not decrease with time and the drug was non-toxic. Another long-term study by Woodruffe (1975) included 22 out of 28 patients who had been satisfactorily treated for over 12 months. Lebouc and Derot (1975) evaluating 50 maturity onset diabetics over several months, 9 completing one year's treatment confirmed its effectiveness on reducing blood sugars. In this study weight gain on glipizide unlike most sulphonylureas was minimal which is similar to our experience. Alexander et al (1975) gave preliminary findings in 23 diabetics who had been placed on a year trial which was not completed at that date. They thought it effective but not giving better results that other sulphoonylureas. However in our study an important feature was the improvement in blood glucose in patients previously treated with sulphonylureas. The incidence of of failure of sulphonylurea therapy has been reported as up to 5 per cent per year (Williams and Porte 1974).Our investigation would suggest that glipizide may be of value in patients when treatment has failed with other forms of sulphonylurea therapy.

In conclusion our study which is comparable to other long term trials confirms that glipizide is a safe effective oral agent and without significant effects on the body weight.

SUMMARY

Fifty-two patients with maturity onset diabetes were treated with glipizide (Minodiab) under the conditions of routine practice of a dibetic clinic. Blood sugar control was assessed after completion of one year's treatment. Percentage ideal weights were compared at the beginning and the end of the period. Patients were subdivided into grossly obese, overweight, normal and

underweight groups. Improvement in the mean fasting and post-prandial blood sugars was observed in all groups. Significant improvement over previous therapy was observed. In conclusion glipizide in doses from 5-20 mg appeared an effective and non-toxic sulphonylurea under the conditions of clinical practice. Our findings would confirm long term trials elsewhere.

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THYROID DISEASE IN PREGNANCY

by

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INTRODUCTION

THE recognition of thyroid dysfunction in pregnancy is important for the welfare of both mother and fetus. Obstetricians tend to think of the thyroid disease as complicating the pregnancy, whereas physicians look at it the other way round. Both viewpoints must be taken into consideration for neither condition can be treated successfully if the other is neglected. The knowledge of how the thyroid disease is affected by the pregnancy, and how the disease and its treatment influences pregnancy and fetal development, is essential in determining the management of these patients.

The purpose of this paper is to review the changes that occur in thyroid physiology in pregnancy and to report the extent of thyroid disease seen in pregnancy in the Royal Maternity Hospital, Belfast, over a 16-year period, 1963 to 1978.

MATERNAL AND FETAL THYROID FUNCTION IN PREGNANCY

Maternal Factors

The physiological changes which occur in thyroid metabolism in pregnancy have been reviewed by Selenkow et al (1973) and Tunbridge and Hall (1975). Information on the interrelationship of maternal and fetal thyroid activity is still incomplete, but some facts are fairly well known.

The BMR rises in pregnancy but this is mainly due to extrathyroidal factors. The protein-bound iodine level is elevated as a result of increased thyroxine binding capacity of the plasma protein, brought about by the secretion of oestrogens during pregnancy. There is an increase in the renal clearance of iodide which is associated with a lowering of the plasma inorganic iodine level. The thyroid clearance of iodine and its uptake of radio-iodine are thus raised to make up for the renal loss of iodide and the gland enlarges in response. This has an important clinical application for it means that thyroid enlargement in pregnancy *per se* is not necessarily due to a pathological process.

The placenta has been shown to secrete a thyroid stimulating factor called human chorionic thyrotrophin. This may explain why the thyroid stimulating activity of the plasma is greater in pregnant than in non-pregnant women and it provides a further reason for the enlargement of the thyroid in pregnancy. Recent evidence suggests human chorionic gonadotrophin may be the chorionic thyrotrophin referred to. The activity of one IU of human chorionic gonadotrophin is equivalent to 0.5μU of human TSH (Kenimer et al, 1975). However, the role, if any, of this placental thyroid stimulator in the regulation of thyroid

function in pregnancy is far from clear. The response of TSH to TRH is increased in pregnancy and is likely to be due to the enhanced sensitivity of the pituitary thyrotroph cell brought about by the increased secretion of oestrogens.

Although the level of PBI, total T_4 and total T_3 rise in pregnancy it must be remembered that it is not the bound but the free hormones which take part in physiological processes. In pregnancy, the free T_4 and T_3 levels remain stable and similar to those in non-pregnant controls and the rate of hormone production and degradation is unaltered. Similarly, serum TSH values remain normal during pregnancy. For these reasons one must conclude that the normal woman is euthyroid throughout her pregnancy.

Fetal Factors

Not much is known about fetal thyroid metabolism. The earliest date that iodinated proteins have been recovered from the thyroid is at the tenth week of gestation and thyroxine is detectable in the serum by the eleventh week. This means that, for the first 10 to 12 weeks or so of intrauterine life, the fetus has no competent functioning thyroid tissue and must, presumably, depend on maternal sources for thyroid hormone, if such is necessary for early development. During the second trimester the fetal thyroid starts to synthesize hormone but the activity of the gland is relatively low. The normal pituitary-thyroid axis is established by the fourth or fifth month of gestation.

In the second trimester fetal PBI and total T_4 concentrations are in the adult hypothyroid range. However, since fetal thyroid binding protein is also low, free T_4 values are similar to those in the maternal circulation. By the end of pregnancy, the fetal PBI, total T_4 and thyroid binding protein are almost equal to maternal levels. In contrast, fetal T_3 levels are low before 24 weeks and while they rise subsequently they remain much lower than maternal levels even at term (Fisher et al, 1973). The concentration of thyroxine in amniotic fluid remains relatively constant throughout pregnancy but triiodothyronine levels are undetectable. Unexpectedly high values of reversed T_3 (3, 3′, 5′-triiodothyronine, rT_3), a hormone with little biological effect, are found between 15 to 30 weeks but decrease substantially thereafter. Mean thyroxine and T_3 values in amniotic fluid are lower and rT_3 levels are higher than the corresponding values in maternal serum (Chopra and Crandall, 1975). The significance of the high concentration of rT_3 in amniotic fluid is not known.

At birth, cord T_3 levels are low while rT_3 levels are raised. In the hours after birth serum T_3 concentrations rise 200 to 400 per cent while T_4 values rise 25 to 50 per cent. The increase in T_4 and part of the T_3 rise is due to the transient neonatal increase in TSH secretion. However, most of the rise in T_3 must be due to a rapid postnatal increase in extrathyroidal conversion of T_4 to T_3.

The rate and extent of thyroid hormone transfer across the placenta remains unsettled. There is evidence that free thyroxine will pass from mother to fetus and that T_3 is slightly more permeable, but the degree of transfer is low (Selenkow et al, 1973). The reverse situation in which fetal thyroid hormone

reaches the mother is even less well known. In a case of maternal hypothyroidism which we observed, the maternal T_4 and T_3 values rose, while TSH levels fell to near normal as the pregnancy proceeded, presumably as the result of transplacental passage of hormone from fetus to mother. After delivery, the mother rapidly became hypothyroid again (Kennedy and Montgomery, 1978). The thyroid stimulating immunoglobulins, the immunoglobulins associated with Graves' disease cross the placenta quite easily.

THYROID DISEASE IN PREGNANCY

Table I records the occurrence of thyroid disease observed in the Royal Maternity Hospital from January 1963 to November 1978.

TABLE I

Thyroid disease in pregnancy. Royal Maternity Hospital, Belfast 1963-78.

HYPERTHYROIDISM		73
Treated medically	68*	
Treated surgically	3	
No treatment	2*	
HYPOTHYROIDISM		64†
NON-TOXIC GOITRE		59
Diffuse gland	39	
Nodular gland	20	
MISCELLANEOUS THYROID DISEASE		112
Total pregnancies		308

* Includes two cases of T_3 thyrotoxicosis.

† Includes two cases of untreated hypothyroidism.

Sixty-eight had their thyrotoxicosis treated with antithyroid drugs while thyroidectomy was performed in three. Two patients were untreated because they were seen late in pregnancy. Sixty-four pregnancies occurred in hypothyroid mothers. All but two were maintained in an euthyroid state with thyroxine during the time they were under observation. In fifty-nine pregnancies a non-toxic goitre was present. One hundred and twelve of the remaining pregnancies were associated with miscellaneous forms of thyroid disease (Table II). Forty and thirty-four had had previous medical or surgical treatment for thyrotoxicosis and were euthyroid during their pregnancies. Seventeen had a thyroid cyst, nodule or simple goitre removed earlier. A previous thyroiditis occurred in eight, and ten women with carcinoma of the thyroid treated by total or subtotal thyroidectomy had thirteen pregnancies between them. In one, the papilliary carcinoma was first recognized in pregnancy and it was removed surgically at the nineteenth week of gestation.

A previous history of thyroid disease indicates the presence of a diseased or imperfect gland which may not be able to support the metabolic demands of pregnancy. Hence, it is important to decide if the mother is euthyroid and to monitor thyroid function throughout pregnancy.

TABLE II

Miscellaneous forms of thyroid disease. Royal Maternity Hospital, Belfast 1963-78.

Previous medical treatment for Graves' disease	40
Previous thyroidectomy for Graves' disease	34
Previous removal of thyroid cyst or nodule or simple goitre	17
Thyroiditis	8
Carcinoma of thyroid	13
Total number of pregnancies	112

PREGNANCY AND HYPERTHYROIDISM

Hyperthyroidism complicates pregnancy in approximately 0.2 per cent of cases (0.18 per cent in this series). Most commonly it results from Graves' disease, but toxic nodular goitre is sometimes the cause. Usually the thyrotoxicosis antedates conception and the latter follows when the hyperthyroid state has been brought under control by treatment. Fertility is impaired and rates of abortion are higher in the untreated thyrotoxic than in normal women.

The diagnosis of hyperthyroidism in pregnancy is often difficult, especially in milder cases, because physiological changes may mimic closely the features of hyperthyroidism. Biochemical investigations may also be confusing because of the changes in thyroid tests brought about by increases in thyroid binding proteins. Pregnancy appears to ameliorate, to some extent, the severity of the thyrotoxicosis so that clinical features may be mild. Radioactive iodine tests administered to the mother must be avoided and reliance placed on the measurement of T_4, T_3 and TSH. Circulating levels of total T_4 and T_3 rise in pregnancy and, as the measurement of free (unbound) T_4 and T_3 is technically difficult and usually not available, most reliance is placed on the free thyroxine index (FTI) using the Thyopac-3 and Thyopac-4 kits (Radiochemical Centre, Amersham). The normal pregnancy value of 90 ± 17 is not far different from the non-pregnant control level of 84 ± 21 and all euthyroid pregnant women fall in the normal range (Bell et al, 1974). A similar free triiodothyronine index can be obtained by using the Thyopac-3 result. The T_3 red cell or resin uptake test performed *in vitro* is also useful. In normal pregnancy the uptake is in the hypothyroid range. In the thyrotoxic patient levels are usually in the low normal range. The occurrence of T_3 thyrotoxicosis in pregnancy will be missed if T_3 values are not measured routinely, because the usual tests are unaltered in this form of hyperthyroidism.

In spite of the help offered by laboratory investigations the diagnosis of hyperthyroidism in pregnancy remains largely clinical. Reliance must be placed

on features such as loss of weight, or failure to gain weight in the presence of a good appetite, a high sleeping pulse rate, a significant goitre with increased blood flow and the eye signs found in Graves' disease, such as periorbital swelling, lid retraction and exophthalmos.

Treatment of thyrotoxicosis during pregnancy demands special care because both disease and treatment carry special risks. The choice lies between antithyroid drugs with or without thyroid hormone supplements and subtotal thyroidectomy (Werner, 1967). Both have their proponents (Becker and Sudduth, 1959; Hawe and Francis, 1962; Herbst and Selenkow, 1965; Talbert et al, 1970; Selenkow et al, 1973; Goluboff et al, 1974). The choice between antithyroid drug treatment and surgery is made on several grounds and need not be influenced unduly by the pregnancy.

Subtotal thyroidectomy is indicated for patients with large goitres causing obstruction, or those whose thyrotoxicosis cannot be controlled by reasonably modest doses of antithyroid drugs (under 300 mg of propylthiouracil or 30 mg of carbimazole daily) or who manifest toxic reactions to antithyroid drugs, or for those who are unwilling to or unable to follow the medical regimen correctly. During the first two trimesters a thyroidectomy performed after suitable preparation causes little risk to the fetus, but during the last trimester an operation may precipitate labour and for this reason antithyroid drug treatment is often preferred. Preoperative treatment must be suited to each patient's needs using antithyroid drugs, iodides and propranolol to render the patient euthyroid. Prolonged treatment with iodides (more than two weeks) must be avoided because of the risk of goitre formation in the fetus. Instead, the beta-adrenergic blocking drug propranolol may be used to control the peripheral manifestations of the disease. Postoperatively it is advisable to put the patient on full doses of thyroxine replacement if the TSH level rises, and to reassess the need for continuing therapy after delivery (Tunbridge and Hall, 1975).

While the results of surgery for thyrotoxicosis in pregnancy are satisfactory (Talbert et al, 1970; Emslander et al, 1974) many physicians prefer to manage thyrotoxic patients with antithyroid drugs. Methods of employing these agents in pregnancy remain controversial. Some recommend antithyroid drugs combined with thyroxine replacement (Selenkow et al, 1973; Prout, 1975) while others (Hamburger, 1972; Mestman et al, 1974; Tunbridge and Hall, 1975) advise the use of antithyroid drugs alone. The divergence of these views stems largely from inadequate information as to the extent to which thyroid hormones cross the placenta from mother to fetus and vice versa. Results with both methods, properly applied, appear to yield equally good results. No final conclusion was reached in a recent debate on the merits or demerits of combined therapy for thyrotoxicosis in pregnancy (Hamburger, 1972; Selenkow, 1972). Until recently, our preference had been for the combined antithyroid-drug-thyroxine regime which had been used to treat the majority of patients attending the joint antenatal endocrine clinic in the Royal Maternity Hospital, Belfast. The aim was to use the smallest dose of an antithyroid drug to control symptoms after which a supplemental dose of thyroxine (0.1 to 0.2 mg daily) was added to maintain euthyroidism in the mother. Carbimazole has been the drug of choice, and is

given in a dose of 30 mg daily (10 mg eight-hourly) and reduced to 20 mg daily (5 mg six-hourly) or less once control has been achieved. Other suitable drugs are propylthiouracil, PTU (100 mg eight-hourly for more severe cases and 50 mg six-hourly for milder ones) and methimazole (similar to carbimazole). More recently, propylthiouracil has been shown not only to block glandular synthesis of T_4, but also to inhibit the conversion of thyroxine to triiodothyronine extra-thyroidally (Abuid and Larsen, 1974). For this reason, PTU may possess a small advantage over carbimazole which does not exert this extrathyroidal effect.

Propranolol may be given without risk in pregnancy until near term. Normally it is used to control symptoms until the action of antithyroid drugs on hormone synthesis takes effect. Propranolol has been suggested as an alternative to antithyroid drugs (Langer et al, 1974) but its use cannot be recommended as sole therapy in pregnancy, because it is impossible to predict those patients who will respond from those who will not (Lowe et al, 1976). Furthermore, it has been shown that infants of women who were receiving propranolol were more depressed at birth than the babies of those who had received placebo tablets. Propranolol has an extra-thyroidal action and increases the production of rT_3 while lowering the level of triiodothyronine.

Antithyroid drugs cross the placental barrier and if given in excess, may cause an abortion, or hypothyroidism and a goitre in the fetus. Accordingly, they must be given with care, in the *smallest* dose necessary to control the hyperthyroidism and combined with thyroxine (0.1 to 0.2 mg) to maintain the maternal free thyroxine index at a normal level. Where it is possible to monitor the response to treatment with sequential TSH estimations thyroxine replacement can be omitted (Tunbridge and Hall, 1975). Any rise in serum TSH above normal indicates over-treatment and the need to reduce the dose of antithyroid drug. This is now the preferred method of treatment in the Royal Maternity Hospital.

Control of the hyperthyroidism should be assessed on clinical grounds and by serial estimation of the FTI, serum T_4 and T_3 and TSH. If there is to be any deviation from normal, the patient should be allowed to remain slightly hyperthyroid. Once good control is achieved, the rose of the antithyroid drug can usually be reduced with safety for the remainder of the pregnancy. In the majority, if the mother has remained euthyroid or or slightly hyperthyroid, the child will be normal at birth. Rarely, the infant may have exophthalmos, a goitre and congenital thyrotoxicosis. This results from maternal thyroid stimulating immunoglobulins reaching the fetal thyroid via the placenta. Babies born to thyrotoxic mothers should be screened for hyperthyroidism. Mothers of those at greatest risk have pretibial myxoedema and severe apthalmopathy. In mild cases, the condition remits spontaneously after four to six weeks when maternal immunoglobulins are eliminated from the baby's circulation. If symptoms and signs are severe, carbimazole (2.5 mg eight-hourly) is given for a few weeks combined with iodine (Lugol's solution one drop three times daily) or propranolol (2.5 to 8 mg six-hourly) may be used as sole therapy (Pemberton et al, 1974). Antithyroid drugs are excreted in milk, so that babies born to mothers who are receiving them must not be breast fed.

Medical treatment for hyperthyroidism in pregnancy is entirely satisfactory if proper care is taken. In this series of sixty-eight pregnancies treated medically, four babies were lost (5.8 per cent) and there were four infants with goitre and neonatal Graves' disease. In one, the goitre was said to be retrosternal. No infant was hypothyroid. Of the babies that died, two were anencephalics and one had multiple congenital defects. If these are eliminated the corrected total fetal loss was 1.4 per cent. In Table III these results are compared with those obtained by other authors.

TABLE III

Fetal loss in thyrotoxic patients treated in pregnancy Method of treatment and number of pregnancies

Authors		*Surgery*	*Antithyroid drug alone*	*Antithyroid drug and thyroxine supplement*	*Fetal loss (%)*
Herbst and Selenkow	1965	0	0	32	9.4
Bokat	1968	0	41	0	4.7
Enslander et al	1974*	274	0	0	8.0
Mujtaba and Burrow	1975	0	68	0	15.0
Royal Maternity Hospital, Belfast	1979	3	5	63	7.0

* Combined series from the literature.

In the remaining five patients, thyroidectomy was performed in three. Two were untreated because they were seen late in pregnancy.On of these was the first case of T_3 thyrotoxicosis recognized in the Royal Maternity Hospital (Martin et al, 1976).

HYPOTHYROIDISM

Is is rare for patients with significant hypothroidism to conceive (Echt and Doss, 1963), and the incidence of spontaneous abortion and stillbirth is increased (Man et al, 1951). Usually, patients become pregnant after they have been treated for previously diagnosed hypothyroidism.

The clinical features of hypothyroidism are well known but minor degrees may be overlooked because of the physical changes that accompany normal pregnancy. Attention should be focussed on an excessive gain in weight, dry skin, undue fatigue, cold intolerance, pallor not supported by anaemia and delayed relaxation of the ankle jerk. The diagnosis is established by finding an elevated TSH (10 μU/ml or greater), a low T_4, T_3 and FTI. Treatment with thyroxine (0.1 to 0.2 mg daily) must be sufficient to achieve euthyroidism which

is confirmed biochemically by the return of the TSH to normal, a FTI at the upper normal level and a T_3 T_4 and PBI in the normal pregnant range. If a patient diagnosed previously becomes pregnant, replacement treatment is continued and the dose adjusted to ensure adequate suppression of the TSH level. Patients with partial degrees of thyroid insufficiency (subclinical hypothyroidism) picked up by routine assay of TSH (Evered et al, 1973) should receive adequate substitution therapy until the termination of pregnancy, after which thyroid function may be reassessed.

Occasionally, patients with untreated hypothyroidism may conceive and carry their pregnancy successfully to term (Hodges et al, 1952; Echt and Doss, 1963) and their offspring have been reported to be normal. There were two patients with hypothyroidism who gave birth to normal infants in this series (Kennedy and Montgomery, 1978). Temporary amelioration of maternal hypothyroidism as the consequence of fetal thyroid hormone production was observed in one case. In contrast, a number of studies of human hypothyroidism have shown an increased incidence of physical and mental abnormalities in the offspring, in particular, permanent defects in the central nervous system (Man et al, 1958). Man (1972) reported an increased incidence of low mental scores in infants born to inadequately treated "hypothyroxinemic" mothers compared to euthyroid controls. However, the diagnosis of "hypothyroxinaemia", based on a low BEI and clinical features unsupported by other biochemical findings, appears to be insufficient evidence upon which to judge the effect of maternal thyroid hypofunction on the infant's mental development. The subject needs to be restudied using direct hormone assays, in particular TSH, to enable maternal thyroid function to be determined with confidence.

In this series, three of the hypothyroid mothers' babies died (4.6 per cent). Two were premature and death was attributed to prematurity and respiratory distress syndrome. Neither showed any thyroid pathology at postmortem. The other was an intrauterine death at 39 weeks. The fetus had Fallot's tetralogy. The mother had an abnormal GTT at 32 weeks and was classified as a potential diabetic.

NON-TOXIC GOITRE

Enlargement of the thyroid is common in pregnancy (Crooks et al, 1964) but its prevalence varies in different areas and on the clinical criteria adopted for its diagnosis. It is much less in areas of high iodine intake (Crooks et al, 1967). Simple goitres which enlarge in pregnancy probably never return to their non-pregnant size.

The complications of haemorrhage into cysts, hypothyroidism and malignant change should always be borne in mind. Haemorrhage may cause a sudden increase in size of the gland, pain and dyspnoea. The blood-filled cyst may be tender. A thyroid scintiscan is contraindicated in pregnancy but ultrasound is safe and gives information about the nature of a suspicious nodule (Ramsay and Meire, 1975). There is evidence that patients with a goitre in pregnancy may not always be able to maintain euthyroidism, so it is important to assess thyroid

function regularly. Hypothyroidism has to be looked for carefully since signs are mild. Thyroxine must be given if the TSH level rises and the FTI falls below normal. Malignant disease must be considered if the voice is hoarse, if the gland is painful or enlarges rapidly, or if examination shows it to be hard, fixed or associated with enlarged lymph nodes.

The development of a single nodule in the thyroid during pregnancy requires careful assessment. If the nodule is hard, painful or fixed or has enlarged rapidly it should be removed without delay. If none of these features is present it probably is safe to observe the patient or to prescribe suppressive therapy with thyroxine. Further investigation of the lesion with appropriate radioiodine tests can then be undertaken after delivery.

Nodular goitres usually enlarge during pregnancy. Provided normal thyroid function is maintained and there are no obstructive features or other complicating features, treatment of the goitre is unnecessary. Occasionally, patients with congenital biosynthetic errors of thyroid hormone synthesis of mild degree, become pregnant. All of these ultimately interfere with hormone production and cause hypothyroidism and formation of a goitre. They can be effectively treated in pregnancy with thyroxine.

In this series of 59 pregnancies in patients with non-toxic goitre, two babies were lost, an incidence of 3.3 per cent.

CARCINOMA OF THE THYROID

The development of corcinoma of the thyroid during pregnancy is very rare. The main difficulty is to recognize the early case which does not show charactcristic signs. The only safe course is to remain suspicious in every patient with thyroid disease and to consider the possibility of malignancy in every goitre. A nodule, which is apparently single and develops fairly quickly is the most likely presentation and usually denotes a papillary growth. It must be differentiated from a thyroid cyst with or without haemorrhage into it or an area of focal thyroiditis. However, if suspicion of malignancy is high the neck must be explored forthwith. Rapidly expanding tumours of the thyroid which are thought to be carcinomatous must be removed promptly without regard to the pregnancy. A previous history of carcinoma of the thyroid is not a contraindication to pregnancy, nor does the pregnancy adversely affect the prognosis of the cancer (Rosvoll and Winship, 1965). This observation has been amply confirmed in the present series. Most commonly the two conditions are seen together in women who have previously been treated for papillary carcinoma of the thyroid and who are on suppressive thyroxine treatment. They should be watched for signs of recurrence and thyroxine suppression should be continued unaltered. Ten of our patients previously treated for carcinoma (papillary 8, follicular 1, medullary 1) had 13 children without loss between them.

THYROIDITIS

Subacute thyroiditis and chronic lymphotcytic thyroiditis may rarely complicate pregnancy. The former causes painful swelling of the gland which may

be diffuse or focal. Signs of mild hyperthyroidism may follow temporarily. The course is subacute and the fever which is low or moderate, persists for several weeks. Signs in the thyroid usually resolve in two to four months. Occasionally the course is chronic and swelling of the thyroid persists much longer. Eventually, resolution is complete and late sequelae have not been observed. Confirmation of the diagnosis may be difficult because radioactive iodine uptake tests are contraindicated. The ESR is always raised and low titres of thyroid antibodies may be found. These combined with the clinical features and tender thyroid are usually sufficient to suggest the correct diagnosis. Treatment with steroids is highly effective but is usually contraindicated in the first trimester because there may be increased risk of congenital abnormalities (Popert, 1962). Other methods which are probably less effective, are antithyroid drugs (carbimazole 30mg daily for two to three weeks) or suppression with thyroxine. Occasionally, a patient presents with a diffuse or hard enlargement of the thyroid and sometimes features of hypothyroidism. Estimation of the thyroid autoantibodies will confirm the diagnosis of chronic lymphocytic thyroiditis (Hashimoto's thyroiditis). Treatment with thyroxine, whether thyroid function is depressed or not, is necessary and the results are satisfactory. Thyroiditis (Table II) was observed in eight pregnancies in this series. No adverse effect on fetal development was seen.

FETAL RESULTS

Hyperthyroidism in pregnancy has been reported to be associated with a slight increase in perinatal mortality and a significant increase in the frequency of low birth weight babies (Niswander and Gordon, 1972). It is uncertain if there is a real increase in the incidence of congenital abnormalities or if antithyroid drugs could be a contributory factor.

TABLE IV

Thyroid disease in pregnancy. Fetal loss 1963-78.

Disease	*Number*	*Abortions*	*Stillbirth*	*Neonatal death*	*Total fetal loss* (%)	*Perinatal mortality* (%)
Hyperthyroidism	73	1	4	0	5(6.8)	4(5.4)
Hypothyroidism	64	0	1	2	3(4.6)	3(4.6)
Non-toxic goitre	59	0	2	0	2(3.3)	2(3.3)
Miscellaneous group	112	1	4	1	6(5.3)	5(4.4)
Total	308	2	11	3	16(5.1)	14(4.5)

311 fetuses – 3 sets of twins

Table IV shows fetal loss for the whole series. The hyperthyroid group had the highest total fetal loss and perinatal mortality, but allowing for the small numbers involved there is really not much difference between the groups. During the period under review the hospital perinatal mortality varied between 65.44 per 1,000 in 1963 and 20.46 per 1,000 in 1977 and the same steady downward trend was observed in all the thyroid groups studied. Only the hyperthyroid and miscellaneous groups come near the maximum hospital perinatal mortality rate. Both these, however, and indeed the other groups were heavily weighed with congenital abnormalities and complications unlikely to be connected with thyroid disease (Table V).

TABLE V

Causes of fetal death in thyroid disease in pregnancy unlikely to be related to thyroid disease

Group	*Cause of fetal death*	
Hyperthyroidism	Anencephaly	2
	Multiple congenital defects	1
Hypothyroidism	Fallot's tetralogy with stillbirth	1
Non-toxic goitre	Multiple congenital defects Trisomy D	1
Miscellaneous group	Anencephaly	1
	Severe Rhesus isoimmunization	1
Total		7

In the hyperthyroid group there were two anencephalics and one infant with multiple congenital defects, while in the miscellaneous group there was one anencephalic and one case of severe Rhesus isoimmunization. If these are eliminated the perinatal mortality for the hyperthyroid group becomes 1.3 per cent and for the miscellaneous group 2.6 per cent, while for all groups it is 2.2 per cent. On balance, therefore, there is no evidence to suggest that thyroid disease contributes adversely to the outcome of pregnancy. Furthermore, there was no evidence to support the view that thyrotoxic mothers produce babies of low birth weight. The mean birth weight of the last 14 babies born to treated thyrotoxic mothers in this series was 3170 g.

None of the 311 infants was hypothyroid. Goitres were observed in four babies born to mothers with treated hyperthyroidism and all had neonatal Graves' disease. One mother, with severe Graves' disease and a very high titre of thyroid stimulating immunoglobulins, gave birth to two affected babies in successive pregnancies. Both infants responded well to treatment with propranolol.

The current view that antithyroid drug treatment has no ill effects on fetal development has not gone unchallenged and some of the workers have expressed concern about possible adverse effects of antithyroid drugs on the development

of the central nervous system of the fetus. In Europe, for example, it is customary to give oral contraceptives to women receiving antithyroid medication for hyperthyroidism. Recently, McCarroll et al (1976) investigated 25 children born to women treated with carbimazole in the years 1960 to 1971 inclusive and assessed their growth and psychological and intellectual development against carefully matched controls born in the same week in hospital. It was apparent that the use of carbimazole in pregnancy had no injurious effects on subsequent growth and intellectual development of the children. Greenman et al (1962) and Burrow et al (1968) came to similar conclusions after investigating the use of propylthiouracil in pregnancy. These results, therefore, lend no support to the view that antithyroid drug treatment in pregnancy is harmful for the mental or physical development of the fetus.

SUMMARY

Changes in thyroid function in pregnancy and the nature of thyroid disease seen in the Royal Maternity Hospital, Belfast, over a 16-year period, are reviewed. All patients with a goitre or a previous history of thyroid disease need careful assessment of thyroid function. If there is any departure from normal they need appropriate treatment and careful follow-up for the remainder of the pregnancy. Therapeutic measures available for the treatment of hyperthyroidism are discussed. Antithyroid drugs may be given without risk to the developing fetus.

Contrary to popular belief, hypothyroid patients can conceive and deliver healthy infants without treatment. The phenomenon of amelioration of the mother's hypothyroidism during pregnancy as the result of transplacental passage of fetal thyroid hormone to the mother is noted. It is considered that thyroid disease in pregnancy, provided that it is recognized and correctly treated, does not adversely affect the outcome of the pregnancy.

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TESTS ON PERIPHERAL BLOOD CELLS IN MULTIPLE SCLEROSIS

by

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IMMUNOLOGICAL and epidemiological investigations have suggested that the multiple sclerosis (MS) reaction results from an abnormal response to a common childhood infection in individuals with a predisposing genetic constiution governed by the major histocompatibilitiy complex. Much effort has gone into the quest for specific infectious agents. Serological studies have pointed towards several 'membrane-associated' viruses as the most likely candidates, with measles being dominant amongst these (Fraser 1977).

The basic defect in MS could be an abnormality of cell membrane function which may not necessarily become manifest as a specific immunological defect or abnormal reactivity to specific microbial antigens. Looked at from this point of view abnormal responses to certain membrane viruses may indicate a non-specific abnormality rather than involvement of the particular virus in the disease process. Accordingly, in a study of peripheral blood cell activity in MS we have chosen to emphasize non-specific rather than antigen-specific aspects of cellular function such as blastogenic response to phytohaemagglutinin (PHA), interferon response to a virus inducer, leukocyte bactericidal and chemotactic responses and erythrocyte fragility. Because of the relatively large number of patients available for study and in view of some discordance in the literature regarding abnormality in numbers of peripheral blood cells showing markers associated with B and T lymphocytes (Sekizawa *et al,* 1974; Nowak and Wajgt, 1975; Oger *et al,* 1975; Lisak *et al,* 1975; Reddy and Goh, 1976; Lamoureux *et al,* 1976; Platz *et al,* 1976; Schauf *et al,* 1977; Nordal and Froland, 1978; Symington *et al,* 1978), we also investigated these parameters.

These studies have been carried out in a group of patients of similar racial origin living in an area where there is a high incidence of the disease (Allison & Millar, 1954).

MATERIALS AND METHODS

Patients

The 76 patients who provided specimens were aged between 17 and 68 years (mean 45 $\pm$ 11), 46 were female and 30 male. All were clinically 'probable' cases of MS as defined by Allison and Millar (1954). Most blood samples were obtained when the patients were attending out-patient clinics for routine review. Patients with severe debilitating illness were not included.

Controls

Blood specimens were obtained from normal healthy blood donors by courtesy of the Northern Ireland Blood Transfusion Service. For comparison with patient groups results from controls were selected to give an age and sex match for each patient.

Blood was collected in non-siliconized glass bottles with preservative-free heparin as anticoagulant (10 u/ml). Separation of cells from both patient and control specimens was always started within one hour of venepuncture Leucocyte preparations were obtained by layering blood on Ficoll-Triosil (Boyum, 1968) and allowing erythrocytes to sediment out at lxg for 30-40 minutes. Mononuclear cell preparations were obtained by centrifugation of blood on Ficoll-Triosil (400xg, 20 min.). Cell suspensions were washed twice with serum-free Eagle's medium (BHK Eagle's Wellcome Reagents Ltd., Beckenham).

Cell Surface Markers

E-rosette-forming cells were detected according to the method of Pang, Baguley and Wilson (1974). An E-rosette-forming cell was defined as a lymphocyte with three or more adherent erythrocytes. EAC-rosette-forming cells were detected according to the method of Luckasen *et al* (1974) using sheep erythrocytes sensitized with Wellcome rabbit anti-serum and normal mouse serum as the source of complement. Cells bearing surface membrane immunoglobulin (SmIg) were detected by direct immunofluorescence using either a polyvalent sheep anti-globulin (Wellcome), or immunoglobulin class-specific antisera obtained from Wellcome (anti-IgG, anti-IgM), Meloy (anti-IgA) or Department of Immunology, Birmingham University (anti-IgD, anti-IgE). The anti-IgA was of goat origin, the others were produced in sheep. Staining of mononuclear cells was performed at 0° for two hours followed by washing with phosphate-buffered saline (PBS) at 4°.

Serum IgA

The level of Iga in serum was determined by immunodiffusion using the 'precision' method with Hyland Immunoplates.

Lymphocyte responses to PHA

The method was based on that described by Penhale *et al* (1974) using 5 x 10^5 mononuclear cells in Eagle's medium containing 10 per cent foetal calf serum per Microtiter well. The duration of culture was 72 hours and 1 μ Ci. tritriated thymidine (5 ci. per m. mol, Amersham) was added to each well for the last six hours of culture. The same batch of PHA (PHA-P, Difco) was used for all tests and five concentrations used to give final dilutions in culture from 1/500-1/8000, three cultures being used for each dilution. Results were expressed as the mean c.p.m. in stimulated cultures minus the mean c.p.m. in unstimulated cultures.

Interferon response to Newcastle Disease Virus (NDV)

In this test 3 x 10^6 mononuclear cells were mixed with 256 haemagglutinating units of NDV (avirulent Ulster strain) in 1.5 ml balanced salt solution containing 6 per cent heat-activated human AB serum. After two hourse incubation at 37° excess virus was removed by washing the cells which were suspended in fresh medium and cultured for 22 hours at 37° in an atmosphere of 5 per cent CO_2 in air. The culture medium was then harvested, dialysed against glycine buffer (pH 3) for three days and stored at –70°. Interferon was assayed on secondary bovine kidney cells (Gresser *et al* (1974) by inhibition of encephalomyocarditis virus plaques. Titres were calculated as the dilution which inhibited 50 per cent of plaques. Equal numbers of media from control and MS cell cultures were tested in each set of interferon assays.

Leucocyte bactericidal activity

Intracellular killing of *Staphylococcus aureus* (Oxford strain) was measured by the method of van Furth and van Zwet (1973). The killing index (K_{60}) was calculated as log N_o – log N_{60} where N_o was the number of viable intracellular bacteria at the end of the initial fifteen minute phagocytosis phase and N_{60} the number of viable intracellular bacteria sixty minutes later.

Chemotaxis assay

Leucocyte chemotaxis was measured in stainless steel chambers obtained from Schleicher and Schull Inc., New Hampshire. Chambers were divided into upper and lower compartments by a Selectron filter (25 mm diameter, pore size 3 μm, type AE97). A solution of casein (5 mg/ml) in Gey's solution was injected into the lower compartment to provide a chemotactic stimulus and 1 ml of leucocyte suspension (2.5 x 10^6 cells) placed in the upper compartment. Control chambers contained Gey's solution in the lower compartment. After incubation at 37° for 30 minutes filters were removed, fixed in absolute alcohol and stained with haematoxylin (Wilkinson 1974). The chemotactic response was assessed by the leading front method (Zigmond and Hirsch 1973) and the results expressed as net migration (μm) towards the casein attractant.

Erythrocyte fragility

Thirty μl whole blood was added to 3 ml of various reagents and held at room temperature for 45 minutes. Lysis was measured by spectrophotometry of supernatants for haemoglobin. The reagents used were (a) dimethyl sulphoxide (Hopkin and Williams) 42 per cent v/v in PBS, (b) lysolecithin (Sigma) diluted in PBS (c) Phospholipase C (Lecithinase C-*CL. welchii.* Sigma) diluted in PBS and (d) hypotonic saline – various concentrations of NaCl in Sorensen's phosphate buffer.

Statistical tests

Results for all patient and control groups were compared on the basis of mean ± one standard deviation (S.D.). Student's t-test was applied to difference between the mean values of PHA responses, bactericidal activity and erythrocyte fragility to phospholipase C.

RESULTS AND DISCUSSION

Leucocyte bactericidal activity

Cells from groups of sixteen patients and controls gave mean K_{60} values of 0.6110 ± 0.2870 for the MS group and 0.9547 ± 0.3635 for the control group. This difference was not significant.

Leucocyte chemotaxis

Groups of twelve patients and controls were compared. Mean net migration towards casein was 122 ± 39 μm for the MS and 143 ± 48 μm for the control group.

Monocyte responses to PHA

The increment of ^3H thymidine incorporated in response to five concentrations of PHA shows that compared with controls MS cells were marginally less responsive to stimulation by the three lower concentrations (Table 1). Other

TABLE 1

Increase in tritiated thymidine uptake in response to different PHA concentrations. Values given as mean c.p.m. increment ± one standard deviation

	Phytohaemagglutinin Concentration				
	1/500	1/1000	1/2000	1/4000	1/8000
Controls (14)	10056 ± 7500	11612 ± 11680	11821 ± 14278	10118 ± 15458	7048 ± 13130
MS (14)	6204 ± 13147	5144 ± 10009	2716 ± 2841	1770 ± 2268	790 ± 818
Significance of difference	N.S.	N.S.	0.05>p>0.025	p>0.05	0.1>p>0.05

reports on blastogenic lymphocyte responses to PHA in MS have been conflicting (Jensen, 1968; Dau and Peterson, 1970; Davis *et al,* 1972; Offner *et al,* 1974; Knight *et al,* 1975; Lamoureux *et al,* 1976; Platz *et al,* 1976; Symington

et al, 1978). If the diminished response of MS cells to PHA is manifest only with sub-optimal concentrations of the mitogen as the present results suggest, then, since most other studies have used a single concentration, the level at which this was chosen would obviously affect the result obtained.

Monocyte interferon response to NDV

Cells from groups of twelve patients and controls were tested. There was no difference between the two groups – mean interferon titres were 1/5000 in the control group and 1/4000 in the MS group.

Monocyte membrane markers

The absolute numbers and percentages of cells demonstrating E-rosette, EAC-rosette and SmIg markers are shown in Table 2 for MS and normal groups. These tests were performed on sufficient numbers of patients to allow division

TABLE 2

Monocyte surface markers. Values given are the mean numbers of cells x 10^{-3} *per ml blood* ± *one standard deviation with the percentage of cells positive for each marker given in parenthesis*

	All Control (59)	*All MS* (59)	*'Steriod' MS* (16)	*'Non-Steroid' MS* (43)
E-Rosette	119 ± 47 (68 ± 9)	141 ± 74 (65 ± 11)	165 ± 98 (62 ± 11)	138 ± 66 (66 ± 11)
EAC-Rosette	53 ± 20 (31 ± 6)	83 ± 47 (37 ± 8)	106 ± 67 (38 ± 9)	74 ± 33 (37 ± 2)
SmIg	53 ± 59 (30 ± 7)	79 ± 47 (37 ± 13)	98 ± 66 (38 ± 14)	74 ± 39 (36 ± 13)

into a 'steroid' group (those receiving corticosteroids or corticotrophin) and a 'non-steroid' group. Although none of the differences between groups was significant it can be noted that the mean values for the 'steroid' group for all three markers showed a greater difference compared with control than those for the 'non-steroid' group. No results from patients receiving steroid therapy have been included in any other patient groups reported in this paper.

Numbers and percentages of cells showing SmIg for each immunoglobulin class are shown in Tabe 3. The only hint of difference was the slightly larger number and percentage of MS cells which reacted with the anti-IgA reagent.

TABLE 3

Number and percentages of monocytes expressing Ig class-specific markers
Values given as in Table 2

	SmIgG (31)	SmIgM (31)	SmIgA (16)	SmIgD (14)	SmIgE (14)
Controls	27 ± 15	30 ± 21	17 ± 9	41 ± 28	22 ± 17
	(15 ± 7)	(15 ± 7)	(9 ± 4)	(22 ± 7)	(11 ± 5)
'Non-Steroid' MS	37 ± 33	39 ± 30	35 ± 25	56 ± 30	22 ± 16
	(15 ± 10)	(17 ± 8)	(16 ± 11)	(27 ± 7)	(11 ± 7)

Investigations of serum IgA in MS patients gave higher mean values than controls (4.36 ± 1.88 g per 1 compared with 2.90 ± 1.71 and measurement of serum IgA in 18 specimens from each of four patients over an 18 month period showed that two out of four had levels consistently in excess of the normal mean value (i) mean 4.43 g per 1, range 3.24 – 5.75; (ii) mean 4.69, range 3.75 – 6.25) whereas the other two did not. There is therefore no consistent association of elevated serum IgA with MS.

Erythrocyte fragility

No significant differences were found between groups of 12 MS and control individuals with respect to fragility of erythrocytes in hypotonic saline, dimethyl sulphoxide, lysolecithin or phospholipase C. Caspary *et al* (1967) reported increased osmotic fragility of erythrocytes from patients with active but not with quiescent MS. Our results are in agreement with this insofar as our patients were not acutely ill with the disease.

The present observations have extended previously reported attempts to define an immunological 'profile' in MS (Lamoureux *et al*, 1976; Symington *et al*, 1978) by applying a number of non-specific tests to peripheral blood cells. A tendency to diminished function in the MS patients was suggested but no significant and characteristic abnormality was defined. We therefore conclude that either (i) there is no systemic immunological or cellular 'fault' in MS as concluded by Symington *et al* (1978), or (ii) the nature of the fault is such that presently available techniques are unable to define it, or (iii) the 'fault' may manifest itself in different ways in different patients. Although we do not have comparative data from normal individuals the observation of persistent elevation of serum IgA in some MS patients is of interest in this context.

SUMMARY

Four tests of cellular function – PHA response, interferon release, bactericidal activity and chemotactic response – all gave lower mean values for multiple sclerosis (MS) groups than for age-and-sex-matched control groups. In only one of the tests (PHA response) did the differences approach statistical significance

and then only when the lower range of PHA concentrations are used. No differences were found between MS and control groups when erythrocyte fragility was tested with hypotonic saline, dimethyl sulphoxide, lysolecithin or phospholipase C. Investigation of lymphocyte surface markers – E-rosettes, EAC-rosettes, and surface immunoglobulin (including class-specific tests) did not show any significant differences between patients and controls.

The work was supported in part by a grant from the Medical Research Council. We are greatly indebted to Col. T. E. Field, Northern Ireland Blood Transfusion Service, for provision of control blood samples.

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ANNUAL REPORT FOR 1977 OF THE BELFAST POISONS INFORMATION SERVICE

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THE Casualty Department of the Royal Victoria Hospital has continued to make available information about potential poisons to doctors in Northern Ireland. When the basic information is not sufficient, the enquirers are referred to a panel of experts who do their best to help. The basic information used by the Service is provided by Dr. Goulding, Poisons Unit, New Cross Hospital, London, and is supplemented by the information derived from various specialist reference books. However, the work of the service would be simplified if all casualty departments and health centres carried a short textbook on the treatment of poisoning (such as "The Treatment of Common Acute Poisonings" by Henry Matthew and A. A. H. Lawson) and two official handbooks in their current editions:

1. Poisonous Chemicals used on Farms and Gardens. Notes for the guidance of medical practitioners issued by the DHSS and revised inserts issued from time to time.

2. Approved Products for Farmers and Growers. Issued every three years by the Department of Agriculture, Fisheries and Food.

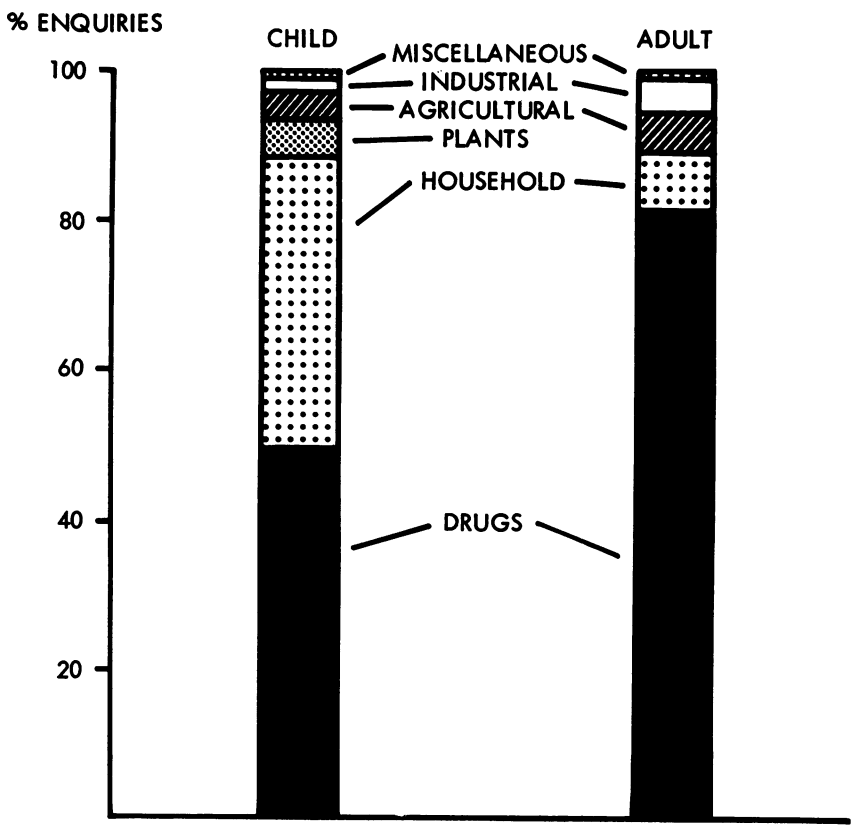
Because many poisoning cases are treated in casualty departments or elsewhere without seeking advice from the Poisons Centre it is not possible to assess the actual number of poisoning incidents occurring in the province each year. Consequently, the figures given in this report may only represent the tip of the iceberg and, indeed, may not give a true picture of the types of poisonings which do in fact occur. Many physicians may, for example, treat overdoses of benzodiazepines routinely knowing that fatalities are unlikely and this will reduce the number of reported incidents giving the false impression that a fall in the number of benzodiazepine self-poisonings has occurred. This is an intrinsic error in the reporting system as it now operates.

In 1977 there was a total of 1,454 enquiries compared to 1,578 in 1976. This was due mainly to an 18 per cent fall in the number of enquiries made for household products. Of these enquiries, 87 per cent came from hospitals, 10 per cent from doctors, chemists and private individuals, and 3 per cent from health centres. Of all enquiries, 55 per cent were for children and 39 per cent for adults, the status of the remaining 16 per cent being unknown. Table 1 shows the

TABLE 1

	1975	1976	1977
Drugs and Medicines	715	939	905
Household	355	446	367
Plants	40	67	46
Agricultural	63	74	70
Industrial	38	39	52
Miscellaneous	13	13	14
	1,224	1,578	1,454

number of enquiries for the various groups over the past three years. The proportion of these enquiries when divided into the various categories of drugs, household products, etc., differ greatly when comparing the reported incidents in children and adults. (Figure).



There were 17 reports of adults in accidental contact with weedkillers such as paraquat and gramoxone. More publicity regarding the use of protective clothing, etc., when using these types of hormonal weedkillers may well be needed.

It is known that children have no ulterior motives other than curiosity or primary experimentation when "sampling" any harmful substances – what they try out will depend very much on the accessibility of these substances. This non-selectivity of the child is seen in Table 2 where, with the exception of the con-

TABLE 2

Children and Drugs – 1977

	No. of enquiries	*Per cent enquiries*	*No. of enquiries/ 100,000 Scripts*	*
Barbiturates	4	(1)	4	(5)
Other Sleepers	13	(3)	4	(3)
Benzodiazepines	17	(4)	3	(4)
Other Tranquillisers	13	(3)	8	(9)
Antidepressants	20	(5)	12	(11)
MAOI Inhibitors	–	(–)	–	(–)
Oral Contraceptives	27	(7)	26	(17)
Iron Preparations	10	(2)	3)	
Analgesic and Antipyretics	37	(10)	5)	(3)
Others	271	(66)	3)	
TOTAL	412	(100)	3	(4)

* 1976 figures in brackets.

traceptive pill (whose "child-proof" pack is still not "child-proof"), the number of enquiries per 100,000 prescriptions is approximately the same in all drug groups.

Most enquiries for adults are probably for deliberate rather than accidental poisonings and show a pattern much different from that of the children (Table 3). In some cases the motivation of the adult may not be far removed from that of

TABLE 3

Adults and Drugs – 1977

	No. of enquiries	*Per cent enquiries*	*No. of enquiries/ 100,000 Scripts*	*
Barbiturates	23	(4)	22	(26)
Other Sleepers	49	(8)	14	(18)
Benzodiazepines	75	(12)	12	(10)
Other Tranquillisers	28	(5)	18	(28)
Antidepressants	92	(15)	57	(23)
MAOI Inhibitors	1	(–)	30	(98)
Oral Contraceptives	3	(–)	3)	(1)
Iron Preparations	12	(2)	4)	
Analgesic and Antipyretics	110	(18)	14)	(2)
Others	208	(35)	2)	
TOTAL	601	(100)	5	(4)

* 1976 figures in brackets.

the child, i.e., curiosity and experimentation, but many other complicating factors must also be present. The adults will be much more selective and they will tend to avoid substances which they know to be harmless and will choose a drug depending on its availability and whether they think it can do effective harm. This is borne out by the figures which show that more enquiries per 100,000 prescriptions are made for the psychotropic groups of drugs when compared with all the other groups. Within this group there were 57 enquiries per 100,000 prescriptions for antidepressants and this is an alarmingly high figure. As there is little evidence that the tricyclic anti-depressants are of any benefit in so-called symptomatic, "reactive" or secondary depression (King *et al* 1977) and as there appears to be an increasing number of self-poisoning attempts using these drugs, this may pinpoint a need to look more closely at the indications for prescribing them. Of the adults about whom enquiries were made 20 per cent took two or more drugs. The benzodiazepines were used in one-third of these drug combinations and the antidepressants in one-fifth.

The reporting system used by the Poisons Service, like most systems, has many limitations not least of which is the lack of some detailed information. When further information was required a follow-up form was sent to the casualty department or to the doctor concerned but since the response rate was so low (25 per cent) and the information received added little to the original, it was was decided to stop this procedure. Most, but by no means all, of the enquiries indicate the sex of the person, whether an adult or child, and the names of the

harmful substances about which the enquiry is being made. Many other details are unknown, for example, how the substance was acquired, how much was taken, why it was taken, whether this type of incident has happened before, whether the patient was treated in casualty or admitted to hospital and the final outcome of the poisoning. Of course, some of these questions would be very difficult, if not impossible, to answer but more information, if it were readily available, may help to pinpoint the people most at risk and this kind of knowledge may lead to a better understanding of the problems and so indicate a more effective way of dealing with them.

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BOOK REVIEWS

GYNECOLOGIC CYTOPATHOLOGY. By Marie L. Schneider and H-J, Staemmler. Pp. xii+187; figs 154; tables 6. £24.50). Eastbourne: Holt-Saunders, 1978.

THIS is an English edition of an atlas first published in Germany and the very readable style of the text is a tribute to both the translator and the authors. The book deals with the diagnosis of the important lesions in gynaecological cytology and with the cellular changes which give rise to diagnostic confusion. Following a chapter on basic cytology there are others dealing with inflammatory and reparative changes in the cervix, as well as dysplasias and malignant lesions. The cytology of endometrial lesions is also covered and there is a section on the rarer gynaecological malignancies.

Each chapter begins with a concise account of the salient cytological features with emphasis on differential diagnosis. This is followed by a series of photomicrographs each of which is accompanied by a schematic drawing which emphasises its main features and also by a legend on the facing page. In all, there are 154 photomicrographs which are generally of a high quality and of good size.

This atlas can be strongly recommended for trainees in Cytopathology. It is concise and clear in its presentation and when used in association with a general text-book it should be readily understood by a beginner in the subject. The only drawback of the book is its price which reflects the high cost of colour reproduction. This is likely to restrict its use to departmental libraries where it should prove a real asset.

J.H.R.

REGIONAL ANATOMY – MULTIPLE CHOICE QUESTIONS FOR SELF-ASSESSMENT AND IMPROVEMENT. By T. R. Murphy. (Pp. 158. £3.50). London: Lloyd-Luke (Medical Books) Ltd., 1978.

THIS useful book has multiple choice questions on the topographical anatomy of the head and neck and the abdomen (each with 80 questions). Five questions with 5 parts each are written on a left hand page and there is a response grid for convenient marking on the corresponding right hand page. A good 2nd M.B. or Primary F.R.C.S. standard is required to answer correctly.

Training in the technique is essential for success in multiple choice examinations. Complete understanding of the question and concentration are necessary requirements as well as a sound knowledge of the subject. This book provides this training and is highly recommended as especially suitable for those doctors about to take the Primary F.R.C.S. examination. Short sections of questions on neuroanatomy and clinical embryology would enhance the book's usefulness.

T.J.H.

A SHORT TEXTBOOK OF MEDICAL MICROBIOLOGY. By D. C. Turk and I. A. Porter. Fourth Edition. (Paper £3.45, board £6.45). London: Hodder & Stoughton, 1978.

THIS edition is an improvement on its predecessors which have obviously survived in the popularity table of small texts on microbiology. However, the improved type face has not been accompanied by elimination of irritating typographical errors; proof-reading has been

BOOK REVIEWS

GYNECOLOGIC CYTOPATHOLOGY. By Marie L. Schneider and H-J, Staemmler. Pp. xii+187; figs 154; tables 6. £24.50). Eastbourne: Holt-Saunders, 1978.

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REGIONAL ANATOMY – MULTIPLE CHOICE QUESTIONS FOR SELF-ASSESSMENT AND IMPROVEMENT. By T. R. Murphy. (Pp. 158. £3.50). London: Lloyd-Luke (Medical Books) Ltd., 1978.

THIS useful book has multiple choice questions on the topographical anatomy of the head and neck and the abdomen (each with 80 questions). Five questions with 5 parts each are written on a left hand page and there is a response grid for convenient marking on the corresponding right hand page. A good 2nd M.B. or Primary F.R.C.S. standard is required to answer correctly.

Training in the technique is essential for success in multiple choice examinations. Complete understanding of the question and concentration are necessary requirements as well as a sound knowledge of the subject. This book provides this training and is highly recommended as especially suitable for those doctors about to take the Primary F.R.C.S. examination. Short sections of questions on neuroanatomy and clinical embryology would enhance the book's usefulness.

T.J.H.

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THIS edition is an improvement on its predecessors which have obviously survived in the popularity table of small texts on microbiology. However, the improved type face has not been accompanied by elimination of irritating typographical errors; proof-reading has been

BOOK REVIEWS

GYNECOLOGIC CYTOPATHOLOGY. By Marie L. Schneider and H-J, Staemmler. Pp. xii+187; figs 154; tables 6. £24.50). Eastbourne: Holt-Saunders, 1978.

THIS is an English edition of an atlas first published in Germany and the very readable style of the text is a tribute to both the translator and the authors. The book deals with the diagnosis of the important lesions in gynaecological cytology and with the cellular changes which give rise to diagnostic confusion. Following a chapter on basic cytology there are others dealing with inflammatory and reparative changes in the cervix, as well as dysplasias and malignant lesions. The cytology of endometrial lesions is also covered and there is a section on the rarer gynaecological malignancies.

Each chapter begins with a concise account of the salient cytological features with emphasis on differential diagnosis. This is followed by a series of photomicrographs each of which is accompanied by a schematic drawing which emphasises its main features and also by a legend on the facing page. In all, there are 154 photomicrographs which are generally of a high quality and of good size.

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On p.47 the brief paragraph on 'Droplets' frightens the reviewer — it is non-informed and tells the reader nothing of significance of large droplets compared with droplet nuclei; this entire chapter (of four pages) must be re-written. This volume cannot be recommended to my students.

R.R.G.

PATIENTS, PRACTITIONERS AND MEDICAL CARE. ASPECTS OF MEDICAL SOCIOLOGY. Second Edition. (Pp. xiv+185. £3.25). London: William Heinemann Medical Books, 1978.

THIS book is written in a practical style, is short and free of 'sociological' jargon. The author, a medical sociologist, describes the social setting of medicine. His aim is to indicate something of the sociologist's role in predicting illness behaviour and to define his relationships with other workers in the field. The family doctor may find it more interesting and relevant to his everyday work than the hospital clinician, because of the heavy social and behavioural content.

Social action and illness behaviour in different clinical situations are discussed. The author defines man as a 'social' as well as a 'biological' animal, and stresses the importance of understanding his social and cultural background. The chapter of greatest value is that concerned with symptom perception by different socio-economic groups and the process of becoming ill, which includes a description of 'sick-role'.

The chapter on the relationship of doctor and patient presents numerous deficiencies in communication and has wide implications for medical education. Doctors are apparently inept at handling uncertainty and they adopt varying strategies. Some see illness in narrow scientific and procedural terms, other see emottional and social issues as the very essence of medical care.

The 'Hospital' chapter is complex and full of 'organisational theories and goals' of some iinterest to a medical administrator, but leess so to a clinician. It does however show the growing complexities of interpersonal relationships between different interdependent social groups in large hospitals.

It is evident that the author has practical experience of applying sociological concepts to help solve clinical problems. Hence among the books available on medical sociology this second edition offers good value for money. It is very readable and to the point and should be read with interest by medical students, and in particular primary care physicians and other health workers.

W.G.

NEUROPHYSIOLOGY OF POSTURAL MECHANISMS. By T. D. M. Roberts, B.SC., PH.D., F.R.S.E. Second Edition. (Pp. 415; figs. 173. £30.00). London-Boston: Butterworths, 1978.

THE physiology of the nervous system is very complex but additional information is being provided regularly and we can expect a better understanding to come with time. At the moment the physiology of many simple reflex systems has been quite fully elucidated and can be comprehended without much difficulty. At the other extreme there is the cortical activity concerned with voluntary activity, appreciation of sensation, etc., which can not be

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THIS book, twenty-first in the series of Major Problems in Clinical Surgery, has been written by two American surgeons. It details the theories of causation, the pathology and disordered physiology of pulmonary complications following majoor trauma and surgical operations. Eight different reasons for respiratory failure are considered and it is emphasised that the physician should not arbitrarily assume that a trauma patient is suffering from 'shock lung' but should attempt to determine the specific cause of the respiratory failure.

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This book is a valuable contribution and should be read by all concerned with the management of patients following major trauma and surgery. It will be of particular interest to those working in intensive care units. Each chapter has an extensive list of references, mainly from American literature, which will make it very useful to the research worker. The price of £12.50 represents good value.

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The book is divided into three sections. The first, consisting of nine chapters, deals with the physiology of the endocrine regulation of the reproductive system. Part two, the largest section, with twelve chapters covers the pathophysiology of the reproductive process. In part three the endocrinology of pregnancy is analysed in two chapters.

I was particularly impressed by the layout, the lavish provision of figures, diagrams and tables, and the wealth of information available for the management of clinical problems. The book is up-to-date, wide-ranging and thoroughly practical. Both distinguished authors have contributed extensively to the text as well as calling in the services of a number of recognized experts in their respective fields.

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D.A.D.M.

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The authors depart from the traditional presentation of hard facts and refer frequently throughout the book to the potential and real emotional and psychological problems of the pregnant mother and her family. In the first chapter the authors point out that in many instances there may not be a family and that poverty, poor health and inadequate nutrition are commonplace. They add that even when a family does exist not all pregnancies are wanted. However, having stated this, the discussion of the emotions and attitudes of mothers in the book reflects those of the intelligent person of adequate means having her first child. The emphasis placed on talking to the mother in this book is brought out in a chapter in which the assessment of the "feelings" of the mother about her pregnancy is discussed immediately following an account of the assessment of the pelvis by vaginal examination. The stress on education of the mother and on understanding her problems during pregnancy is interesting and is rarely given as much attention in British books.

The chapters on anatomy and physiology are good and many of the illustrations are taken from established American post-graduate texts, indeed the basic information contained in this book is sound and up to date but at times attains post-graduate level. On occasions the American flavour of the book is strong, such as the suggestion for opening questions when discussing contraception.

First question: "I am glad to see you this morning, how can I help you today?"

Second Question: "Do you know how a woman gets pregnant?"

Finally the terminology is American and this is important when a topic such as perinatal mortality is discussed – the definition given in this book is deaths after 20 weeks gestation and up to 28 days after the birth. The comment is made that this rate is higher than in the rest of the industralised world – if this is the definition used it is not surprising!

The book would be of interest to midwives who have a teaching capacity and serves as a comment on the developing role of the midwife in the United States.

J.W.K.R.

OBSTETRICS AND GYNAECOLOGY. (Coincise Medical Textbooks). By R. W. Taylor and M. G. Brush. (Pp 220; figs. 27. £2.95). London: Bailliere Tindal. 1978.

THIS is the first edition of a 213 page textbook written by Professor Taylor of St. Thomas' Hospital Medical School and Dr. Brush, a senior lecturer in biochemistry at the same institution. The authors claim to have written for the medical student "a concise comprehensive book which will give him an overall view of the subjects". Indeed the text is concise and inevitably condensed., thus important topics such as anemia are deal with in less than two pages. The vaginal discharges due to trichomonas and monilia are discussed in ten lines and a description of the nature of the discharge is not included.

The chapter on menstrual abnormalities is brief and not particularly well classified. The care of the normal and abnormal baby receives scant attention and is dealt with in six pages. It is surprising in a book so recently published that the discussion of maternal mortality and its prevention receives more attention than perinatal mortality. One chapter has an unfortunate title – The Unhealthy Mother – in which topics such as rhesus isoimmunisation are discussed.

The diagrams included in the book are good and there is a welcome chapter on normal and abnormal sexual relationships, a subject not usually included in such books. However a book presenting such condensed information requires a good classification of each topic and a better layout with sub-headings. The student might find this book useful for revision but it would not be his best introduction to the subject.

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The authors depart from the traditional presentation of hard facts and refer frequently throughout the book to the potential and real emotional and psychological problems of the pregnant mother and her family. In the first chapter the authors point out that in many instances there may not be a family and that poverty, poor health and inadequate nutrition are commonplace. They add that even when a family does exist not all pregnancies are wanted. However, having stated this, the discussion of the emotions and attitudes of mothers in the book reflects those of the intelligent person of adequate means having her first child. The emphasis placed on talking to the mother in this book is brought out in a chapter in which the assessment of the "feelings" of the mother about her pregnancy is discussed immediately following an account of the assessment of the pelvis by vaginal examination. The stress on education of the mother and on understanding her problems during pregnancy is interesting and is rarely given as much attention in British books.

The chapters on anatomy and physiology are good and many of the illustrations are taken from established American post-graduate texts, indeed the basic information contained in this book is sound and up to date but at times attains post-graduate level. On occasions the American flavour of the book is strong, such as the suggestion for opening questions when discussing contraception.

First question: "I am glad to see you this morning, how can I help you today?"

Second Question: "Do you know how a woman gets pregnant?"

Finally the terminology is American and this is important when a topic such as perinatal mortality is discussed – the definition given in this book is deaths after 20 weeks gestation and up to 28 days after the birth. The comment is made that this rate is higher than in the rest of the industralised world – if this is the definition used it is not surprising!

The book would be of interest to midwives who have a teaching capacity and serves as a comment on the developing role of the midwife in the United States.

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RADIOGRAPHIC POSITIONING AND RELATED ANATOMY. By Isadore Meschan. (£14.95.) Philadelphia, London, Toronto: Saunders and Eastbourne: Holt-Saunders. 1978.

THIS is yet another excellent book by Professor Meschan. Although primarily for the student radiographer, it is possibly the best reference book for the trainee radiologist or doctor, working in an accident and emergency department, to learn radiological anatomy and to have at hand a book, of reasonable size, which is easily used for reference should he have any doubt regarding either the quality or the diagnosis of a film.

The content is comprehensive, including all the major systems and a chapter on computed tomography. The quality of the line diagrams is exceptionally good and, if we must enter a minor caveat, it would be that the illustrations of the X-rays are not always of the same high standard and are, in some cases, too small.The short paragraphs on each page referring to practical points of interest have the merit of being complete and accurate and succinct.

There are many larger volumes on this subject, including one by Professor Meschan himself, from which many of the illustrations are drawn, but this small book represents exceedingly good value for money, and it would be entirely adequate for most practical purposes. It can be strongly recommended as being interesting and enjoyable.

E.M.McI.

FIRST YEAR PHYSICS FOR RADIOGRAPHERS. By Hay and Hughes, Second Edition. (Pp 271; figs. 109. £3.95). London: Bailliere Tindall, 197 .

THIS small book can be recommended for first-year trainees in radiology as an easily read, but necessarily superficial, course in physics. Paragraphs are well laid out, diagrams are simple to understand and clearly explained, and there is a good cross-reference system. Aspects appear to be governed by a "need to know" philosophy, and the actual technical working of the apparatus is not explained although its purpose is outlined.

One could strongly recommend this book for revision prior to Primary Fellowship, but it would not replace the more detailed textbooks available.

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PRICE'S TEXTBOOK OF THE PRACTICE OF MEDICINE. Edited by Sir Bodley Scott (Pp 1495. £25.00). Oxford: Oxford University Press. 1978.

THE twelfth edition of this classic textbook has more than twice as many contributors as the last – 79 as against 34. Fortunately, updating has been achieved without quite doubling the size of the book but, nevertheless, this now runs to almost 1500 pages. With so many contributors, it is inevitable that the material is presented a little unevenly and, because of the length of time such a tome takes to be produced and printed, a few of the sections tend to be already out of date.

Nevertheless, as originally indicated by Dr. Frederick Price in the first edition of this textbook, the intention is to present a comprehensive survey of modern medicine. This edition certainly reflects once again contemporary practice in the United Kingdom and continues to provide practitioners and students of medicine with a useful work of reference. Considering the mass of information contained in the book, the price of £25.00 is very reasonable.

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VIRAL HEPATITIS. By Saul Krugman and David J. Gocke. Volume XV in the series Major Problems in Internal Medicine. (Pp xiii+147; illustrated. £12.25). Philadelphia, London, Toronto: Saunders. 1978.

THIS monograph summarises current knowledge of types A and B viral hepatitis and also makes reference to the frequent association of non-A, non-B hepatitis with blood transfusion. Hepatitis due to cytomegalovirus, EB virus, coxsackie virus and yellow fever virus is not considered.

The first three chapters are concerned with historical, aetiological, pathogenetic and epidemiological aspects of the subject. Differences in the characteristics and transmission of HAV and HBV are discussed and HAAg, Anti-HAV, HBsAg, HBcAg, HBeAg, Anti-HBC and Anti-HBs are described.

In the chapter on acute virus hepatitis figures are effectively used to illustrate the time sequence of the principal immunological, biochemical and clinical events in the course of the illness though in one or two instances, e.g. Fig. 3-4, the valuable information contained therein could have been made more readily accessible by additional simple annotation. Fulminent hepatitis receives careful consideration and the very full discussion of possible mechanisms and precipitating causes of hepatic encephalopathy and its management is a welcome bonus.

The chapters on chronic hepatitis, the hepatitis carrier and post-transfusion hepatitis are followed by an absorbing discussion on hepatoma associated with hepatitis B infection and extrahepatic manifestations of hepatitis virus infections, in particular the serum sickness-like syndrome of acute hepatitis and polyarteritis nodosa and glomerulonephritis associated with hepatic B infection.

In the final chapter on the prevention of viral hepatitis the importance of general measures designed to interrupt the chain of transmission of the virus is emphasised. The place of passive immunisation against types A and B hepatitis with immune serum globulin and hepatitis B immune globulin is discussed and hope is expressed that in the near future active immunisation against type B hepatitis will be possible.

This carefully written, well-illustrated, expensive monograph contains much important information including 437 references. It will have particular relevance for those with a specialty interest in viral hepatitis.

T.F.

THE CLINICAL RECOGNITION OF CONGENITAL HEART DISEASE. By J. K. Perloff. (Pp xv+781; illustrated. £29.75). Philadelphia, London, Toronto: Saunders and Eastbourne: Holt-Saunders. 1978.

THE second edition of Dr. Perloff's book – The Clinical Recognition of Congenital Heart Disease, is highly to be commended. As its title indicates the emphasis is on the clinical manifestations rather than on invasive laboratory procedures. Within the confines of its terms of reference the book presents a comprehensive survey of congenital heart disease.

The clinical descriptions of history, physical signs, phonocardiographic, electrocardiographic and radiological appearances are unsurpassed and superbly illustrated. In an age of technological excellence this book not only instructs but presents the reader with a timely reminder of the wealth of relevant information which is still readily available without immediate recourse to sophisticated invasive diagnostic procedures.

In this new edition the author has taken cognisance of recent developments in non invasive diagnostic techniques, particularly M mode and two dimensional echocardiography. Most chapters include a description of the echocardiographic appearances, although illustrative echograms are sadly lacking.

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P.M.

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THIS textbook is well written with good illustrations particularly the coloured photographs. The authors, I feel, have succeeded in making this book a worthwhile companion for the postgraduate student. Although it is useful to the undergraduate also, it is generally considered to be too advanced for him.

The text covers most aspects of obstetrics and neonatology and it is unfortunate that it does not include gynaecology. The paper is of high grade and the binding is sturdy and attractive.

Like any other medical book there are some parts which can be regarded as controversial. Although it has over 500 pages one can read this book fairly quickly because of the good quality print.

Overall I consider this book to be of great value to the postgraduate student and well worth having in the teaching hospitals.

H.L.

GENITOURINARY CANCER. By D. D. Skinner and Jean B. de Kernion. (Pp xv+567; illustrated. £22.75). Eastbourne: Holt-Saunders. 1978.

IN introducing a new textbook in any aspect of medicine today, a fresh stimulating approach to the particular subject matter is often difficult to conjure up. The authors have succeeded in formulating an authoritative text from contributions of established experts in leading North American Urological centres.

Urology, just as other branches of medicine, has benefited from the veritable expansion of scientific knowledge and technology that has occurred in the past thirty years. The authors have distilled a great depth of the contributors knowledge and experience to present an easily read, single volume which deals totally with all aspects of genito-urinary cancer.

I think that the ideas expressed concerning current research and future investigations are useful adjuncts in assisting the clinician to appreciate the limitations of present day treatments. The continuing problem of clinically staging transitional cell bladder cancer is taken a step nearer solution by the detailed comparison of the Jewet classification with the European TNS notation.

The chapter on the pathobiology of transitional cell cancer presents an attractive concept for the depths of its central idea.

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PEDIATRIC UROLOGIC SURGERY. By Eckstein, Hohenfellner and Williams. (Pp xii+527; Illustrated. £66.25). Eastbourne: Holt-Saunders. 1978.

THIS large new book, Surgical Paediatric Urology, by Eckstein, Hohenfellner and Williams, has been assembled by its three editors as a comprehensive guide in this relatively new sub speciality of surgery. Very many of the varied disorders of the urinary tract in children are carefully documented by a series of individual authors, each one dealing with a subject in which he has had considerable experience.

In addition to being principally a textbook of operative technique, there is in each chapter a very useful opportunity presented by each contributor to discuss the diagnosis. Whilst undoubtedly operative technique is best seen in the living situation, the volume contains an excellent series of good illustrations which are always more easily understood than pages of dry words.

The volume is an extremely useful reference text in that the most important European and British authors are brought together in the subject in one volume.

Pre-fellowship candidates could usefully glance through the volume but certainly the detail is far in excess of what they would require, the information as clearly indicated in the preface is largely for the specialised centre.

J.A.K.

PEDIATRICS. By John Apley. (Pp 453; figs. 38. £4.95). London: Bailliere Tindall. 1978.

JOHN APLEY'S Paediatrics is written in a "chatty" and unconventional style. This book sets out to emphasise the importance of a sound clinical approach to the subject rather than to provide a mass of factual data. Though the first chapters are particularly high in verbiage and low in information once the author starts to deal with the particular systems the book comes to life. When reading these chapters one feels one is at the bedside being taught by a particularly talented clinical teacher. The ideas expressed and information given are probably as up to date as any of the short textbooks.

It was good to see a subject such as mental handicap handled humanely without lapsing into the usual "medical pornography" which revels in lurid details of obscure syndromes. Infant feeding is a subject which few medical students every fully comprehend yet Apley's chapter on this subject is a "gem" which should solve the mysteries for many. With medical students in mind, I was disappointed to see little reference to those topics which, though rare in real life, are surprisingly common in the mind of the medical examiner, e.g., Hirschsprung's disease. I fear that this will devalue the book for the student who is more concerned with gaining sufficient factual information to pass finals than in learning the art of good clinical paediatrics

My main criticism of this book would be its illustrations which are few in number and generally of poor quality. I also believe that the same message could have been imparted with less philosophy and more economy of words.

I would certainly recommend any one working with children to read this enjoyable book from cover to cover. Unfortunately I fear this text will not be the number one choice of students or junior doctors as it was written with higher goals in mind than to satisfy the present demands of the examination hall.

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PATHOLOGY OF PERIPHERAL NERVE. By A. K. Asbury and P. C. Johnson. (Pp 311; illustrated. £15.00). Volume 9 in series. Major Problems in Pathology. Philadelphia, London, Toronto: W. B. Saunders. 1978.

As with so many studies requiring close clinicopathological correlation and specialised techniques, many of the major contributions to peripheral nevre pathology have been made by clinicians rather than pathologists. As a result, the general pathologist has tended to ignore many of the recent advances in peripheral nerve pathology and trainees in pathology often fail to appreciate that with relatively simple techniques, much information can be gained from the histological study of peripheral nerves.

Pathology of Peripheral Nerve is written with the general pathologist in mind and most of the histological illustrations are of paraffin-bedded material, conventionally stained. The authors devote a chapter to the histology of normal peripheral nerve and give the special methods required for its study. The chapter on basic pathological mechanisms is written with great clarity and sets the background for the further chapters on the various forms of neuropathy. A fair balance between the common and the rare is maintained and recently recognised entities, such as giant axonal neuropathy, are mentioned and appropriate references cited. Among the most useful chapters is that giving aetiological classifications of peripheral nerve disease and that dealing with laboratory techniques.

This volume is in competition with several other monographs on the same subject all of which have appeared relatively recently. Asbury and Johnson however deal with this specialised subject in a particularly clear and concise style and this book must be strongly recommended to all general histopathologists, to neuropathologists and as a reference book in laboratories. It is also valuable reading for neurologists, neurosurgeons and neurophysiologists.

I.V.A.

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THIS small text presents a concise account of those drugs used in ophthalmic practice, and describes the various ocular side effects of systematically administered preparations. The book is well written and divided into sections on basic pharmacology, drugs used in the eye and drug actions and interactions. A useful glossary is provided for quick reference.

Myotics, cycloplegics, mydriatics, local anaesthetics, staining agents, anti-microbial compound and anti-inflammatory agents are discussed in some detail. Several figures and useful tables, summarising drug actions are presented. Several important groups of ophthalmic drugs are omitted, e.g. anti fungal and anti-parasitical preparations.

The value of this text unfortunately is reduced by a number of incorrect medical statements, particularly relating to the effects of parasympathomimetic drugs on accomodation, the relationship of atropine to the formation of anterior synechia, the use of sulphonamides to treat scleritis and episcleritis and flourescein antiography.

The pharmacology of most ocular drugs however, is succinctly and clearly presented and I believe there is much of value in this text for the practising ophthalmic optician and medical student.

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SYMPTOMS, SIGNS AND SYNDROMES. By B. Champney, S.R.N., R.N.T. and F. G. Smiddy, M.D., Ch.M., F.R.C.S. (Pp 196. £1.95). London: Bailliere Tindall. 1979.

IT is suggested by the authors that nursing and other ancillary staff with their close and enduring contact with patients have an invaluable opportunity to observe the changing

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J.E.M.

THE CERVICAL SPINE IN TRAUMA. By A. J. Gerlock, S. G. Kirchner, R. M. Heller and J. J. Kaye. (£6.25). Philadelpiha, London, Toronto: Saunders and Eastbourne: Holt-Saunders. 1978.

THIS monograph, the eleventh in the Advanced Exercises in Diagnotic Radiology, has been compiled by a team of radiologists from the Vanderbilt University Hospital, Nashville, Tennessee, to help casualty doctors interpret the x-ray films of the cervical spine of an acutely injured patient.

The anatomy of the cervical spine is described in detail and is illustrated well by means of radiographic reproductions and line drawings. These chapters are followed by a series of 30 test cases, in each of which the reader is invited to inspect a reproduction of a radiograph of the cervical spine, answer questions relating to the abnormality thereon and make a diagnosis. A line drawing of each abnormality and answers on it are available on the following pages. A good range of post – traumatic derangements of the cervical spine is covered and most readers will enjoy the challenge of the test cases, in some of which the questions are arranged as a multiple choice.

This addition to the Advanced Exercises in Diagnostic Radiology should be of value to students and junior doctors dealing with injured patients, and to trainee radiologists.

R.S.C.

HEART DISEASE IN INFANCY AND CHILDHOOD. By John D. Keith, Richard D. Rowe and Peter Vlad. Third Edition. (Pp 1083; figs. 478. £36.00). London: Bailliere Tindall. 1978.

IT is twenty years since the first edition of this book appeared and became the standard text on the subject. In few fields have the past twenty years seen more rapid advances than in the diagnosis and treatment of heart disease in childhood and especially in infancy. Recognising this the authors have virtually re-written the book, a huge task made possible largely by the remarkably efficient method of data gathering, storage and analysis employed at the Hospital for Sick Children, Toronto. The result is a book which distils the wisdom and experience of workers whose personal knowledge of their subject is without equal.

All aspects of the subject are covered. The most up to date methods are succinctly described and their value assessed against a background of their historical development. This is nowhere better illustrated than in the chapter on cardiac catheterization where Professor Rowe considers the question of whether non-invasive techniques may eventually supplant the invasive techniques in the diagnosis of heart disease. The value of such new techniques as echocardiography, nuclear techniques and exercise testing is stressed and many helpful illustrative echocardiographic tracings are published alongside the high quality selective angiographic pictures.

As in any text book some chapters are outstanding. That on ventricular septal defect remains the definitive text, based as it is on Professor Keith's personal observations in many thousands of cases followed over many years. The chapter on transposition of the great arteries by Professor Langford Kidd is also outstanding. Among the great strength of this book is the way is deals with urgent practical subjects such as the management of

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distressed newborn and cerebral complications in congenital heart disease. It is typical of the forward attitudes of the authors that a section on atherosclerosis in childhood should be included.

This is a large book but the division of the material into four major units, each composed of relatively short well illustrated chapters, makes it a pleasure to read as a text book and simple to consult as a work of reference. Each chapter has a large and remarkably up to date biblography. All in all the principle authors and their co-contributors have ensured that this book will continue for years to come to be regarded as the 'bible' of paediatric cardiology.

M.E.S.