VOLUME XXXVIII SUMMER 1969

THE ULSTER MEDICAL JOURNAL

PUBLISHED BY
THE ULSTER MEDICAL SOCIETY

The Ulster Medical Journal

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1969

CONTENTS

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

THE ULSTER MEDICAL JOURNAL

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THE ULSTER MEDICAL SOCIETY

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.....19.....

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CONTENTS

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THE
ULSTER MEDICAL JOURNAL

PUBLISHED ON BEHALF OF THE ULSTER MEDICAL SOCIETY

Vol. XXXVIII SUMMER 1969 No. 2

THE FOUNDATION AND EARLY DEVELOPMENT OF THE ROYAL BELFAST HOSPITAL FOR SICK CHILDREN

By H. G. CALWELL, B.A., M.D., D.T.M.&H.

THE ROBERT CAMPBELL MEMORIAL ORATION
delivered to the Ulster Medical Society, 16th January, 1969

I AM deeply sensible of the great honour the executive committee and trustees of the Robert Campbell Memorial Fund have done me by the award of the Memorial Prize and Medal. Each recipient has the duty of delivering the Robert Campbell Memorial Oration before the Ulster Medical Society, of which Robert Campbell was President in the session 1918–19. It gives me especial pleasure that the honour has fallen to me during the presidency of my old schoolfellow and fellow-student, Dr. R. W. M. Strain.

The first four orators were close personal friends and colleagues of Robert Campbell. Their successors have included a few who were his students and many who knew him only by reputation. Although I must place myself in the last category seeing that Robert Campbell had died four years before I became a medical student yet I can claim that the name Campbell was a household word to me in my youth. Members of the Campbell family and of my own family had been connected in friendship since the time of the installation of the Reverend Robert Campbell in Templepatrick Presbyterian Church in 1796. The man we commemorate was his grand nephew. To me the name connotes a living tradition which embraces a span of more than one hundred and seventy years.

Robert Campbell served the Royal Belfast Hospital for Sick Children for almost 23 years when it was in Queen Street. He was appointed honorary assistant attending surgeon in September 1897 when John S. Morrow was promoted to be full surgeon, and when Morrow resigned in October 1898 Campbell became full surgeon. The junior vacancy was filled by Andrew Fullerton.

The year 1898 which saw Campbell's promotion also saw the appointment as matron of the hospital of Miss Amy Isobel McTaggart. She resigned in 1906 to

marry Robert Campbell and was succeeded by Miss Constance Rome who held the post for only 18 months before resigning to marry Thomas Sinclair Kirk, Campbell's senior surgical colleague in the Children's Hospital.

Robert Campbell's best known work in the field of children's surgery was his pioneering of the operative treatment of inguinal hernia. He did not recognize any lower age limit which by itself ruled out operation. The change in practice which followed his appointment is reflected clearly in the hospital returns. In 1899 only 8 children were operated upon for inguinal hernia – probably because of acute complications in every case – but in 1900 there were 15 such operations, only 4 of which were done because of complications, and the annual total rose steadily so that in 1907 there were 108 operations for hernia.

Campbell extended the surgery of childhood still further by transferring a large share of the operative work from the wards to the out-patient department. Children suffering from hernia and many other conditions who had previously been admitted to the hospital for operation were now operated on as out-patients, especially young children who could be carried home by their mothers shortly after operation. Fullerton's list of out-patient operations under the new dispensation would astonish even the boldest surgeon to-day.

The effect of the departure from traditional practice which Campbell had introduced is well illustrated in the hospital returns. In 1910 the number of out-patients with inguinal hernia was 107 and of in-patients 93; in 1919 the figures were 195 and 12 respectively. This was an increase of 82 per cent of out-patients whereas the number of in-patients with inguinal hernia fell to only 13 per cent of the 1910 figure. This represented an enormous saving in beds for this condition alone.

At the end of 1912 the Board of Management expressed concern about the "severe" operations being done in the out-patient department. They asked the medical staff to report on the matter. In due course Andrew Fullerton, although a junior surgeon, appeared before the Board as the spokesman of the staff and succeeded in convincing the members that the practice of operating on out-patients was both safe for the children and advantageous to the hospital's economy.

During the Great War Robert Campbell shouldered a heavy burden of extra work in the wards and the extern owing to the absence with the Forces of Andrew Fullerton and P. T. Crymble the assistant surgeons. He died in 1920 full of honour if not of years.

Having thus briefly placed Robert Campbell in the context of the Children's Hospital I shall now develop the theme of my commemoration of him, which is the foundation and early development of that hospital of which he was an ornament and in which his greatest work was done.

We who live in a welfare state look back to an era of philanthropy when a few pioneers laid the foundations of much that we take for granted. There was such an era in Belfast about a century ago when the population of the town was some 175,000. Between 1867 and 1872 no fewer than seven new hospitals were established in the town and an eighth a few miles outside it. Moreover the bed complement of the General Hospital in Frederick Street has been almost doubled in 1865. Two of the new hospitals were for children – the Belfast Hospital for Sick Children and

the Ulster Hospital for Children, both of which were established and opened in 1873. This amounts to a staggering sum of voluntary effort which cannot be praised too highly, and should never be forgotten.

The need for better medical treatment of sick children, especially those of the poor, had long been recognized; nevertheless there was much opposition to the provision of children's hospitals. A main objection was that the right place for the sick child was his home and the right nurse his mother. Another was that hospitals already existed which catered for patients of all ages.

Children were indeed being admitted to the wards of the General Hospital at the time. In the 12 months previous to the opening of the Children's Hospital 175 children under the age of 10 years were admitted to the General Hospital (about 7 per cent of the total admissions), and thirty of these had been accompanied by their mothers who stayed in hospital with them – not because the managers of the hospital in 1873 held enlightened views of the psychological needs of children in hospital but because of lack of suitable nurses and difficulty in feeding young children separated from their mothers. There was one occasion when a burnt child was denied admission because his mother, who had a large family of young children, could not remain in the hospital. The child died at home, and his death was the subject of a coroner's inquest. This incident was brought to the attention of the public as an argument for the need for a children's hospital.

Children were also admitted to the Workhouse Hospital and the Fever Hospital (now Gardner Robb House), but as lately as 1892 the Medical Officer of Health in Belfast in discussing child mortality stated that the "respectable poor" had a prejudice against the workhouse hospitals.

I have not been able to discover the infantile mortality rate in Belfast in the 1870's. The earliest report I have seen is for 1891 when it was 173 per 1,000 live births for the whole town and 227 for the Dock Dispensary District. In 1884 so many children were dying that the cororner decided to hold an inquest in every case where a child had died whose life was insured and who had not been attended by a doctor in the last illness. He found that children were being allowed to die of neglect and returned a number of parents for trial. His action is said to have resulted in the reduction by one half in the deaths of insured children within a few years.

When I began my enquiry into the question of who the actual founders of the Children's Hospital were my attention was drawn to a memorial window in the First Presbyterian Church, Rosemary Street, Belfast, which commemorates Samuel Martin of Killyleagh, Co. Down, and describes him as "Founder of the Sick Children's Hospital, Belfast." The hospital referred to is however not the Belfast Hospital for Sick Children but the Throne Martin Hospital which Martin founded in 1872 at Whitewell near Belfast for the treatment of children with spinal disease. It was opened in 1874.

The leading figure in the foundation of the Children's Hospital was Herbert Darbishire, a member of a Belfast linen firm. When he died in 1908 the Board of Management recorded "their deep sense of loss at the death of Mr. Herbert Darbishire, who was perhaps more than anyone responsible for the foundation of the hospital in 1873, when Dr. Smyth's and Dr. Fagan's dispensary in King Street was taken over." Further evidence is found in an article in the Weekly Irish Times of

25th November 1911 in which an anonymous writer describes him as the "leading spirit" in the foundation of the hospital.

The medical founding fathers were Dr. John Fagan and Dr. Brice Smyth. It was in their premises in King Street that the hospital began its life, and it was on the foundation they had laid, however superficial, that it was built.

It was not entirely a man's project. In 1895 Fagan drew attention to the part played by women. "To the ladies of Belfast," he said, "we owe the establishment of this hospital. . . . Its supporters at the beginning were struggling against great obstacles, but the ladies took the matter up, and from that moment the hospital was a success."

The writer in the Weekly Irish Times introduces a mysterious note when he refers to an incident in the very early life of the hospital. He states that the committee of the Ulster Hospital was largely responsible for the establishment of the Belfast Hospital for Sick Children. He gives no evidence for this nor does Marshall, the historian of the Ulster Hospital, mention any such connection between the two hospitals. I shall therefore examine it further.

In a newspaper report (14th August 1873) of a meeting of the committee of the Ulster Hospital there is the statement that a member of that committee was charged with having withdrawn his support from the Ulster Hospital and assisted a relative to start the hospital. Neither of these individuals is identified.

The allegation was immediately denied by the committee of the Children's Hospital in two letters. They stated that the insinuation was groundless and "an unmerited aspersion on one of the most respected, upright and liberal-minded of their fellow-citizens." I have been unable to find the reply of the committee of the Ulster Hospital.

This incident must have been the basis for the statement in the Weekly Irish Times nearly forty years later that the committee of the Ulster Hospital had played a large part in the establishment of the Children's Hospital. Whatever its truth – and there is no evidence extant to support it other than I have mentioned – the report indicates that relations between the two hospitals were already strained when they were only a few months old.

The inaugural meeting at which it was decided to establish the Belfast Hospital for Sick Children was held in 25 King Street on 15th May 1873. The Mayor of Belfast, Alderman James Alexander Henderson, proprietor of the Belfast News Letter (Fig. 1) presided, and there were present fifteen other gentlemen. The linen trade, law, medicine, shipping and other commercial activities were represented. Protestant and Roman Catholic joined hands in the cause of helping sick children. It is, to me, a remarkable fact that the attendance did not include any clergyman. It is not conceivable that members of a profession so intimately aware of the poverty and distress in Belfast at the time would have withheld their support if called upon. I can only conclude that the organizers of the meeting had not invited any clergyman to attend.

It was resolved that "an institution for the treatment of sick children of the poor . . . be established forthwith" and that it should be called "the Belfast Hospital for Sick Children." Its objects were defined – "first to provide medical treatment for the sick children of the poor; second to diffuse . . . a knowledge of the proper management of young children in health and sickness; and third to promote the

FIG. 1. *Alderman J. A. Henderson*

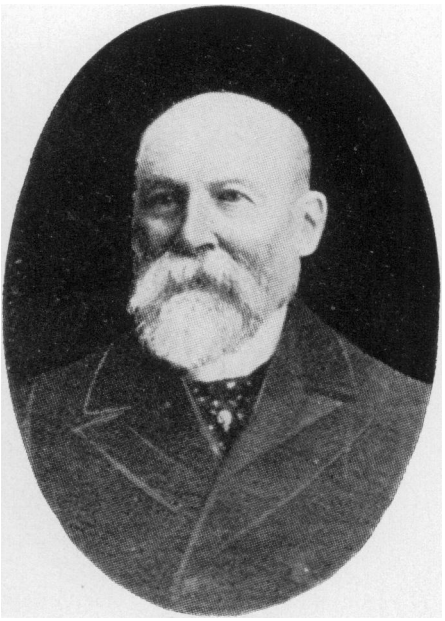

FIG. 2. *William Robertson*

advancement of medical science with references to the diseases of infancy and childhood." This was in 1873, and I do not think these objects of a children's hospital would require amendment in 1969. It was also decided that the new hospital should take as its model the Great Ormond Street Hospital for Sick Children (which had been founded in London in 1852). Dr. Samuel Browne mentioned that he was "very happy to be able to carry out the views of his young friends, Dr. Smyth and Dr. Fagan."

The meeting then proceeded to appoint a provisional committee of management, the first chairman of which was William Robertson (Fig. 2) who was to serve in that capacity until 1883 and again from 1890 to 1896. He was one of the founders of the firm of Robertson, Ledlie and Ferguson, whose address, "The Bank Buildings", is still a household word in Belfast. The first honorary secretary was Herbert Darbishire and the first honorary treasurer Robert S. Craig of the Bank of Ireland in Donegall Place.

The first members of the honorary medical staff were also appointed at the inaugural meeting. They were : Dr. James W. T. Smith consulting physician (Fig. 3), Dr. Samuel Browne consulting surgeon (Fig. 4), Dr. John Fagan (Fig. 5) and Dr. Brice Smyth (Fig. 6) attending medical officers. Dr. Reuben Bolton was appointed apothecary at the yearly salary of £25.

Darbishire was to recall the inaugural meeting in a speech in 1880 when he referred to "the day nearly seven years ago, when a few gentlemen of intelligence and earnestness met in a small dusty room in King Street. The speeches were short, but there was the right ring in what was said; it meant work; it meant success."

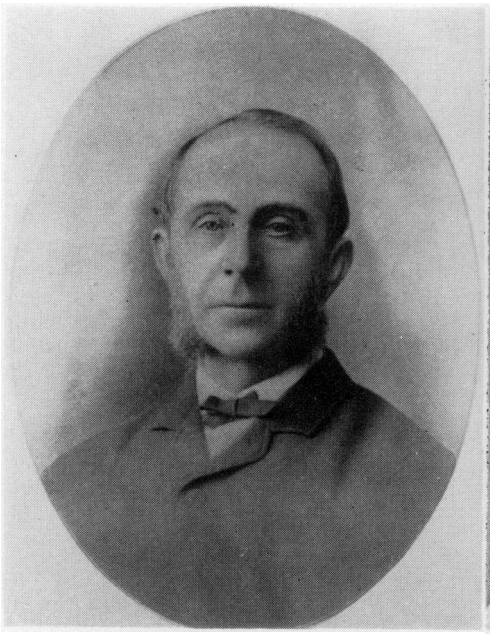

FIG. 3. *J. W. T. Smith*

FIG. 4. *Samuel Browne*

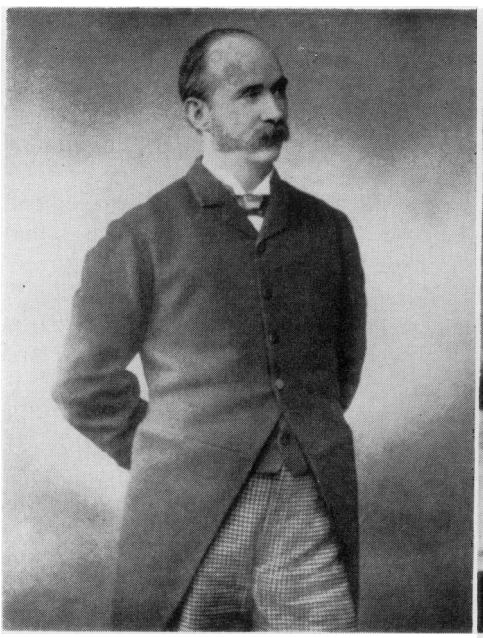

FIG. 5. *John Fagan*

FIG. 6. *Brice Smyth*

I cannot think of a better example of Victorian self-confidence – indeed, self-satisfaction. Darbishire saw the founders of the Children's Hospital as intelligent, earnest, not garrulous but talking good sense, hard working and successful.

The first action of the provisional committee was to instruct Darbishire and the two attending medical officers to prepare a circular setting out the objects of the hospital and to have 1,000 copies printed and distributed widely in the town and neighbourhood. The circular, a copy of which has been preserved, gives details of the committee of management, of the ladies' committee and of the medical staff. It also presents at length the thoughts of a layman and two medical men on the needs of sick children in Belfast in 1873 and how they proposed to meet them.

The circular is headed "Belfast Hospital for the Sick Children of Ulster." This is the only occasion as far as I know when the word "Ulster" was included in the title. It shows that the founders did not intend to limit their bounty to the town of Belfast; indeed the circular elsewhere specifically mentions the sick children "of this Province."

The document is much too long to reproduce in full, but not to quote part of it would detract greatly from the picture I am trying to paint:

"The want of such an institution . . . having been long felt . . . a number of philanthropic gentlemen . . . met together . . . for . . . providing some means of alleviating the sufferings of a class that has been heretofore much neglected – the sick children of the poor.

"In . . . all the principal towns of this kingdom there exist hospitals for sick children; shall Belfast, with its unrivalled wealth and prosperity, be backward in such humane work?

"The appalling fact, that of the number of children born yearly one-half died before they reach the age of ten years, must astonish those who have not given the matter any consideration, and show that a few beds in a general hospital can do little. . . .

"The sick child of a poor family is inevitably neglected in its home, . . . and nobody, not even the overworked mother, has leisure to attend to it. Perhaps timely medical aid, nourishment and cleanliness would make it well. But these are difficult to be found, and the child is hustled into a corner, where it pines and wastes to death, or is laid hold of for life by some incurable and painful disease.

"It is proposed that this new hospital be established on the same principle as the Children's Hospital in Great Ormond Street, London, which in its infancy had to contend with difficulties as great as those we may expect to meet. . . .

"This hospital is not intended to be a special hospital . . . the wards will be devoted to the treatment of all diseases affecting little sufferers under ten years of age.

"All deserving patients will be prescribed for and get medicines gratuitously. . ."

The reference to "deserving" patients reflects concern lest the charity of the hospital should be abused by parents who could afford private treatment. Such concern was frequently expressed both by hospital management committees and private doctors in the days of voluntary hospitals. Doctors sometimes thought they were experiencing unfair competition from hospital out-patient departments. On two occasions at least, in 1881 and 1890, the Ulster Medical Society drew the attention of the Board of the Children's Hospital to the "alarming increase" in the

numbers attending hospital out-patient departments in Belfast and asking that a wage limit be fixed above which patients would be excluded. After an exchange of views the Society expressed satisfaction with the way the extern in the Children's Hospital was being run in the matter of separating "deserving" patients from the others. The honorary secretary of the Ulster Medical Society in 1890 was Dr. John McCaw who was also an honorary attending physician in the Children's Hospital.

In reply to criticism about the appointment of the first members of the medical staff at the inaugural meeting instead of at a later formal meeting of the provisional management committee (presumably after public advertisement) Darbishire replied that it would have been fruitless to seek public support for the new hospital unless it could be shown to command the services of doctors who had already won public confidence. Let us therefore look more closely at the four men who were the first members of the honorary medical staff of the Belfast Hospital for Sick Children.

FIG. 7. *College Square East. Samuel Browne's house is second from right*

They were all close neighbours in what was once the medical centre of Belfast. Browne, the consulting surgeon, lived in 19 College Square East (Fig. 7), James W. T. Smith, the consulting physician in 3 Glengall Place (now the site of the Grand Opera House), John Fagan, one of the honorary attending medical officers, in 1 Glengall Place, and Brice Smyth, the other attending medical officer, lived in 13 College Square East.

Samuel Browne was the son of the Reverend Solomon Browne of Castledawson. His first qualification was that of L.K.Q.C.P.I. which he must have obtained by 1830, for he entered the Royal Navy in that year as an Assistant Surgeon, just two months after the death of George IV. He served afloat on the West Indies, North America and Mediterranean Stations and in the Atlantic and the North Sea in ships ranging from H.M.S. Prince Regent of 120 guns to H.M.S. Fairy, a survey vessel. He was promoted Surgeon in 1839 but on leaving H.M.S. Barham in that year he never held another naval appointment although he remained on the active list until his retirement from the Royal Navy in 1868.

On returning to Belfast from the wooden square-rigged ships of the young Queen Victoria, Browne obtained an appointment in the Belfast General Dispensary – a charitable institution for "the care of children and of the eye." His next activity

was the establishment in 1844 of the Belfast Ophthalmic Institution and Children's Dispensary in Mill Street which he conducted along with Dr. A. G. Malcolm. Browne lectured on ophthalmic medicine and surgery in the Ophthalmic Institution. It became the Belfast Ophthalmic Hospital in Great Victoria Street in 1867.

Browne obtained the diploma of M.R.C.S.Eng. in 1851 and of M.K.Q.C.P.I. in 1881. At the time of the establishment of the Children's Hospital he was a consulting surgeon in the General Hospital and in the Samaritan Hospital and attending surgeon in the Ophthalmic Hospital. He was also Superintendent Medical Officer of Health and Surgeon to the Belfast Sailors' Home. He had been Mayor of Belfast in 1870, and his portrait hangs in the City Hall. It was presented to him by "some of his pupils in the Belfast Royal Hospital, of which Institution he was Surgeon for 25 years", as the plaque which was at one time attached to the portrait recorded.

James W. T. Smith was born in Belfast in 1830. He was a student in Queen's College and obtained the diploma of L.R.C.S.I. in 1848 (when aged only 18) of M.R.C.S.Eng. in 1850, and graduated M.D. in the Queen's University in Ireland in 1853. The M.D. was the primary medical degree in those days and for many years to come. His first appointment was to a poor-law dispensary in Belfast. He later became a visiting physician in the General Hospital and consulting physician in the Lying-in Hospital in Clifton Street. He was President of the Ulster Medical Society in the session 1869–70 and of the Northern Ireland Branch of the British Medical Association.

Smith died in 1890 while still actively engaged in what was described as the most extensive private and consulting practice in Ulster. He was said to have been a very popular clinical teacher around whom students flocked in the ward. R. H. Hunter has written of him: "He crowded into his life an amount of work seldom ever achieved by the longest lived member of our profession. . . . In diagnosis he was absolutely unrivalled. At the bedside in the hospital it was not enough to say that he shone in diagnosis; he was often sparkling and really lustrous."

John Fagan was born in Westmeath in 1843 and received his medical education in the Catholic University in Dublin. He obtained the diploma of L.R.C.S.I. in 1865, of L.R.C.P.I. in 1866 and of F.R.C.S.I. in 1874. He studied in London, Paris and Vienna as well as Dublin. He was appointed an attending surgeon in the General Hospital in Frederick Street in 1872. He resigned from the staff of the Children's Hospital in 1892 and became honorary consulting surgeon. He was President of the Ulster Medical Society twice – in 1884–85 and again in 1885–86.

In 1931 the Board of the Children's Hospital erected a tablet to Fagan's memory. It is in the corridor near the door of the Barbour (surgical) ward. The inscription reads :

In Grateful Memory of Sir John Fagan, M.D., F.R.C.S.I.
one of the two Founders of this Hospital
Always its supporter and friend, and Teacher in the
Belfast Medical School. Surgeon to the Hospital
from 1873 to 1897. Consulting Surgeon until his
death on 17th March 1930.

The date 1897 is in error. It was in 1892 that Fagan resigned from the medical staff of the Children's Hospital.

Brice Smyth was born in Banbridge in 1838 and received his medical education in Dublin where he attended Trinity College and graduated M.B., M.Ch. of Dublin University. At the time of his appointment to the staff of the Children's Hospital he was a visiting medical officer in the Belfast Union Infirmary and an attending physician in the Lying-in Hospital. To avoid confusion it is necessary to mention that in those days the "physician" in the Lying-in Hospital was in fact the obstetrician. The term "physician" was also applied to those practising gynaecology.

Brice Smyth resigned from the post of attending physician in the Children's Hospital (then in Queen Street) and was appointed consulting physician. He held this post until his death in 1922. He too is commemorated by a mural tablet which the Board originally erected in the medical ward in Queen Street. It is now in the corridor of the Falls Road hospital near the door of the Musgrave (Medical) ward. It reads :

To the Memory of Brice Smyth,
B.A., M.B., M.Ch., T.C.D.
Joint-Founder and life-long friend
of this Hospital
Physician and Teacher here until 1883
Consulting Physician until his death in 1922

These then are the four men who formed the first medical staff of the Children's Hospital and created the tradition which their successors have followed and built upon for almost a century now.

The first rules of the hospital were drawn up by a solicitor and the attending medical officers. As far as strictly medical matters are concerned the most important rule was No. 3 :

> "Children between the ages of 2 and 10 years *only*, suffering from non-contagious diseases shall be admissible as in-patients; and children from birth to twelve years shall be prescribed for as out-patients."

The exclusion of infants indicates the fear there was of infection within the hospital and the difficulty of feeding babies artificially in those days. It was even found necessary in 1878 to raise the lower age limit for in-patients to three years; the upper limit was raised to twelve years at the same time.

For many years the Board of Management was composed entirely of men. There was it is true a Ladies' Managing Committee but this was entirely subordinate and was not represented on the Board. In 1897 Professor John Byers claimed that the Children's Hospital had been the pioneer institution in Belfast in giving women a place in the directorate but it was not until 1904 that the rules of the hospital were changed to allow six nominees of the Ladies' Committee to serve on the Board. Even then the gentlemen exercised extreme caution by stipulating that the six ladies should retire annually and only four of them should be eligible for re-election.

In spite of their exclusion from the Board for the first 27 years of the hospital's life, the ladies had much responsibility. The Ladies' Managing Committee had the task of collecting funds . . . "and of providing articles of household use . . . or of clothing for its poor inmates." In addition they were to appoint from among themselves lady visitors . . . to visit the hospital, to examine into the efficiency of the arrangements and to report their observations and suggestions in writing for the consideration of the Board.

The premises in which the hospital began its life, 25 King Street, (Fig. 8) belonged to Samuel Gibson, grocer and druggist. As lately as 1967 it was possible to read his name and trade faintly visible on the front of the building, but the lettering is now obscured by paint. To-day the building houses a variety of tenants; it still has a hospital connection for it is the home of a football pool which devotes its profits to a voluntary hospital. This plan of "augmentation of the Funds of the Institution" (as one of the ladies' tasks was described) never, I am sure, occurred to them in the course of their deliberations in the same premises in 1873.

The lease of 25 King Street was only for three years. The annual rent was £70 plus taxes, but it was part of the agreement with Samuel Gibson that he would refund £5 from the first payment and £2 from each annual payment thereafter as donations to the funds of the hospital.

At this stage of preparation a member of the Ladies' Committee secured the interest of an Edinburgh lady, Mrs. Hay, the ex-matron of the Edinburgh Hospital for Sick Children. She had been trained in Great Ormond Street hospital and had been matron of the Edinburgh hospital from its opening until 1869. Her advice based on actual experience in an established children's hospital and in starting a new children's hospital was of the greatest value to the Belfast hospital as there was no other children's hospital at hand from which suggestions and ideas could be obtained.

Although the Belfast Hospital for Sick Children was born complete with medical staff it had yet to find a matron. Mrs. Hay introduced and recommended Miss Lennox (Fig. 9), a Sister in the Royal Victoria Hospital, Netley, once a famous

FIG. 8. *Original home of the hospital, 25 King Street*

FIG. 9. *Miss Lennox*

British military hospital. Miss Lennox had been a pupil in Miss Florence Nightingale's Training School. The ladies approved of her, and on 14th September 1873 the Board appointed her to be the first matron of the hospital. She was to serve until 1891.

Mrs. Hay visited Belfast twice – once to supervise the arrangements for turning the premises into a hospital and to draw up the rules for its internal administration and a second time to be present at the admission of the first in-patients: Before she returned to Edinburgh the Board thanked her for her services and presented her with a "handsome silk dress", nor did they omit to thank Mr. and Mrs. James Combe whose guest she had been at Ormiston during both visits.

The hospital was opened for out-patients on 2nd June 1873 without formality, and on 4th August the first in-patients were received. At first there was only one ward which accommodated nine patients but two months later another, also accommodating nine, was opened.

The admission of patients was left to the discretion of the medical staff but the Board declared itself opposed to the admission of "tedious or incurable cases". There was however no insistence on strict compliance with the rules of the hospital about the admission of under-age children.

During the seven months ending 31st December, 1873, 1,617 new patients attended the extern department embracing 3,345 consultations. The commonest conditions were diarrhoea, bronchitis, "febricula", and tuberculosis in its manifold forms – lupus, phthisis, tabes mesenterica, struma and hip and spinal disease. Tuberculosis was the greatest cause of morbidity, accounting for eighteen per cent of the total number of new patients. Syphilis was diagnosed in twenty-eight children and rickets in only two.

The number of in-patients in the same period was 110 of whom fourteen suffered from bronchitis, thirteen from tuberculosis, six had wounds and two had fractures. There is no mention of burns or scalds.

I have not found any account of the atmosphere of the hospital other than passing references by speakers at annual meetings of the friends and supporters. One such was "most favourably impressed with the state and management of the charity. The officers were all at their posts; the apartments were perfectly clean, well ventilated and comfortable; the whole appearance of the children bespoke the care and kindness with which they had been treated, and the smile of welcome which passed over their pale and languid features showed that they had been accustomed to see in every visitor's face the countenance of a friend."

The first President of the hospital was the Reverend William, first Baron O'Neill (Fig. 10) of Shane's Castle, Antrim. Lord O'Neill held the office until his death in 1883, and members of the O'Neill family continued to hold the presidency throughout the whole life of the hospital as a voluntary institution – a total period of seventy-five years.

The "politics" of philanthropy – to coin a term – in the 1870s in Belfast form a most interesting study. The General Hospital had for generations been the recipient of the charitable public's bounty without competition from other hospitals. Suddenly there arose many new claimants to a share, and the managers of the General Hos-

pital were naturally on guard against the depletion of their income by subscribers transferring their loyalty from the old to one or other of the new charities.

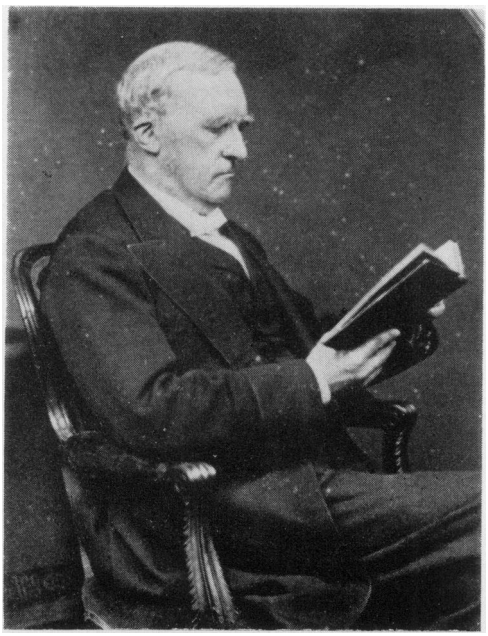

FIG. 10. *Lord O'Neill*

There was one occasion when it was reported that a woman who had always supported the General Hospital refused to do so any longer because, as she said, they did not admit children. The honorary secretary of the General Hospital stated that in the 36 years he had been connected with it no child had ever been refused admission. He continued: "It is all very well for people to build hospitals and collect subscriptions . . . but let them not send forth to the world what was the reverse of the truth . . ."

Similar uneasiness caused the Moderator of the General Assembly to draw attention in 1874 to "the multiplication of special hospitals which have grown to be a serious thing in the community . . . these hospitals have been founded for medical speculation and some for social needs . . ."

Although there were now two children's hospitals in Belfast, the Ulster Hospital for Children having been opened in Chichester Street on an unknown date but probably about the same time as the Children's Hospital, I do not find any diminution in the number of children being admitted to the General Hospital. The trend was in the other direction, and in 1887–88 the total number admitted in twelve months reached a peak of 203 compared with 119 in the twelve months before the opening of the Ulster Hospital for Children and the Belfast Hospital for Sick Children.

Within a year the total number of new out-patients in one month was about 500 embracing almost 1,000 attendances. Some members of the Board had doubts about some of the children being "the sick children of the poor." However, there was no attempt to define poverty in this context, and, as the doctors were not complaining and the majority of the children were of the class for which the hospital was intended, the Board decided not to make any change.

In the last complete year in King Street (1878) there were 6,553 new out-patients and 217 in-patients. Fagan and Brice Smyth unaided had shared the whole of the routine clinical work and much of the administration since the beginning. The burden was now proving too much, and the Board decided to appoint a junior attending physician and a junior attending surgeon who would be responsible for the out-patient work. The senior men would be responsible for the work in the wards. This was the first occasion on which applications for posts on the honorary medical staff were sought by public advertisement.

There were three candidates for the post of junior physician. John W. Byers, M.D., M.A., Q.U.I., was elected (Fig. 11). The only candidate for the surgical post was William G. Mackenzie, L.R.C.P.&S.Ed. (Fig. 12) who was elected. Both began work in the hospital early in 1879. It is worth noting that Byers achieved the status

FIG. 11. *J. W. Byers*

FIG. 12. *W. G. MacKenzie*

of honorary physician, albeit junior, at that stage of his career at which a young doctor to-day would still be a pre-registration house officer.

Let us look at the details of the work that Fagan and Brice Smyth did in the King Street hospital.

Year	*New out-patients*	*In-patients*	*Operations*	*Deaths*
1873	1,617	101	—	2
1874	5,408	311	"several"	7
1875	7,429	308	12	8
1876	6,743	262	13	—
1877	6,363	277	10	4
1878	6,553	217	10	1
Total	34,113	1,482		

Of the total of 217 children admitted in 1878, 128 required medical and 89 surgical treatment. The physician's burden was greater than the surgeon's but I do not think there can be any doubt that Fagan continued to do a good deal of surgery of children in Frederick Street. Operations in the King Street hospital were still few. The reports used the term "capital" which is unfamiliar to us to-day who

use the term "major" instead. In 1876 13 such operations included excision of knee, elbow and wrist joints, amputation through thigh, leg and foot, lithotomy, incisions into joints and various operations on diseased bone.

The table shows that only 22 children died in the King Street hospital from its opening until the end of 1878. Most of these children were reported to have been moribund on admission. There can be no doubt, however, that children suffering from incurable conditions, for example, tuberculosis meningitis, must sometimes have been taken home to die. A letter to the press gave the impression that in the writer's view the small number of deaths in the hospital was due to the practice of refusing admission to children who were seriously ill and likely to die. This was rebutted strongly at an annual meeting when it was stated categorically that the doors of the hospital had not been closed against any "even the most serious and dangerous cases." The speaker attributed the smallness of the number of deaths to the skill of the doctors.

Better out-patient accommodation was provided before the end of 1874, and certain surgical instruments required for "capital cases" were supplied. The original equipment had cost £23.16.0 when the wards were opened in 1873. The Board now granted £30 for instruments and before the end of 1875 an additional 18 guineas for the purchase of instruments "specially adapted for a children's hospital."

In 1876 Fagan was again asking for money, this time to purchase the instruments necessary for operating on a child with a stone in the bladder. He was granted £5 and in due course performed the operation. It is sad to relate that the child died the next day. This was the first post-operative death in the history of the hospital.

Time does not permit me to deal with the subject of finance in detail. Here is the monthly account of household expenditure in October 1873, the first months in which all eighteen beds were in use :

Miss Lennox :	
Milk	£4 1 1
Washing	1 9 5
Coffin	6 0
Groceries	2 9 10
Meat	5 10 4
Coal	3 0 0
Bakery	3 17 0
Hardware	15 2
China	3 15 11
Flannel	1 4 5
Water	2 19 11
Total	£29 9 1

This expenditure amounts to less than £1 per day for the 18 children and the household which included the matron, two nurses and some domestic servants. It is a very low figure by any standard and is partly explained by the fact that the hospital was receiving many gifts in kind such as fruit, vegetables, jam, clothing, toys and books.

The income in 1873 was £1,155 and the expenditure £642, leaving a credit balance of £513. In 1878 the income was only £807 but the expenditure was only

£656 so that by the end of the year there was an accumulated credit balance of nearly £1,000. The household expenditure in 1878 was only 25/- for each in-patient, the cost of each bed was only 5/3 per week, and the cost of drugs for each new out-patient was 2.2 pence. It was an economical establishment indeed.

Before I end my account of the King Street period I must refer briefly to the various attempts that were made to amalgamate the Belfast Hospital for Sick Children and the Ulster Hospital for Children.

Even before the opening in June 1873 Darbishire was visited by a deputation which sought to explore the possibility of co-operation between the Children's Hospital and a dispensary and hospital for the treatment of women and children that was in process of being established (and would become the Ulster Hospital for Children). A discussion of the matter in the provisional committee of the Children's Hospital only led to the reply that their organisation was complete and they could not see their way to make any addition to the present medical staff.

Negotiations were resumed two months later. Agreement was reached to close the hospital in Chichester Street (the Ulster) and incorporate its working elements with those of the King Street hospital unless it should be decided later that the Chichester Street premises were the more suitable for carrying on a united hospital. The committee of the Ulster Hospital would not agree however that any member of its medical staff be omitted from the staff of the united hospital, and the "Belfast" committee would only receive the consulting physician and surgeon and one of the two attending medical officers. When they discovered that these last mentioned were both poor-law dispensary doctors who were in duty bound to attend their dispensaries every morning and could not therefore be present also in the hospital extern at the time prescribed by the rules of the hospital the "Belfast" committee would not pursue the negotiations further and they were broken off. Both hospitals kept the public informed of their respective cases by letters to the newspapers. The Children's Hospital even went the length of having 1,000 pamphlets printed and distributed giving an account of the matter.

The next mention of amalgamation, at least in public, was in June 1878 when two members of the Board of the Children's Hospital, Sir John Preston (Fig. 13) and the Hon. Robert T. O'Neill (Fig. 14) (son of Lord O'Neill) intimated to the Board their desire that the two hospitals should be amalgamated. Soundings were made which revealed that one serious obstacle to amalgamation was the absence of any rule in the Children's Hospital by which clergymen had the right to enter the wards and minister to children. Anticipating this difficulty the Board adopted such a rule, although, as was said, the need for it had never been experienced and clergymen were free to minister to the children since the opening of the hospital.

The negotiations began. The "Belfast" delegation was composd entirely of laymen, and the "Ulster" included three clergymen. "Religion" was the dominant theme of the discussions. The first rule of the Ulster Hospital was "The Word of God shall be free in the hospital." The "Belfast" representatives were afraid that this rule would allow indiscriminate preaching and praying in the wards by all and sundry; the "Ulster" representatives would not move from it. Both sides consulted their committees and met again a few days later to resume discussion. There was no progress. The Board of the Children's Hospital refused to depart from their own practice as they feared that the new principle would destroy the

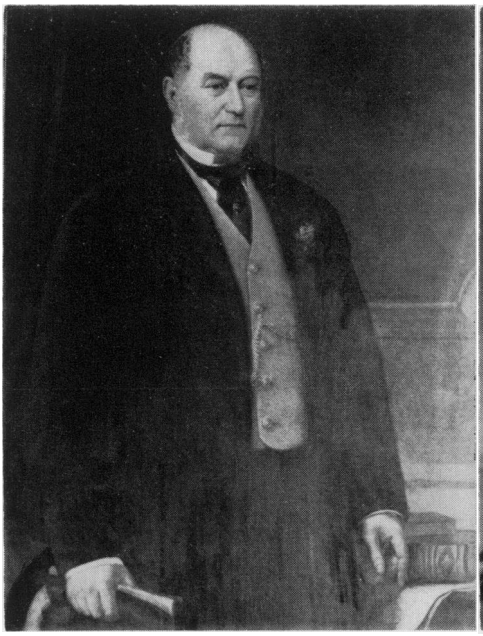

FIG. 13. *Sir John Preston*

FIG. 14. *Hon. R. T. O'Neill*

unsectarian nature of the hospital and practically close its doors against many of the children for whose benefit it was founded. The Board of the Ulster Hospital resolved that they could not acquiesce in any plan for amalgamation save on the basis of the first and fundamental rule. And so two groups of men whose chief aim was to alleviate the bodily ills of the poor children of Belfast parted company and went their separate ways.

Let Lord O'Neill have the last word in a letter he wrote to Darbishire: "As the hospital is not an educational institution, but one whose primary object is bodily cure, I am quite of my son Robert's opinion that it would not be desirable to adopt any course or prescribe any rule which would have the effect of depriving Roman Catholic children in Belfast of its benefits." The Reverend William had got to the heart of the matter. Proselytism was still feared in Ireland.

R. H. Hunter writes of the controversy: "The dispute seems, on the surface, one that should have been amicably settled, but . . . its origin made this impossible. . . . The Belfast Hospital had been founded and was controlled by . . . Dr. Brice Smyth and Dr. John Fagan, the former a Unitarian and the latter a Roman Catholic. The Ulster Hospital, on the other hand was founded and controlled by Presbyterian interests, and the dispute was really a clash between opposing religious faiths."

We have now reached the end of the King Street story. Whilst the many activities I have described were going on the new building in Queen Street was being planned and erected. The hospital left its cramped birthplace for its new home on 24th April, 1879, and it was into that inheritance that Robert Campbell would enter in 1897. The foundation on which he was to build a broader and taller surgical edifice

had been laid by the men and women who established and developed the King Street hospital.

In the first Robert Campbell Memorial Oration in 1922 the late Professor Thomas Sinclair ended with these words: "In taking leave of our departed friend at this stage, it occurs to me that if anyone requires an incentive to, or aid, in cherishing the memory of Robert Campbell, he could not do better than reflect upon the motto . . . of the . . . clan of Campbell, and engrave upon his memory the legend 'Dinna Forget'."

I follow this admonition and repeat his words, "Dinna forget." Hold in memory Mrs. Hay and Miss Lennox, the O'Neills, Herbert Darbishire, William Robertson, Samuel Browne, James Smith, John Fagan, Brice Smyth and the many other men and women who created and nurtured the Royal Belfast Hospital for Sick Children.

Acknowledgements

I am indebted to the authorities concerned for access to the records and reports of the Royal Belfast Hospital for Sick Children. I am also indebted to the Town Clerk of Belfast for permission to photograph portraits in the City Hall and to the following for the loan of photographs and portraits: Mrs. K. D. Campbell, Captain O. W. J. Henderson, Miss M. H. Hudson, Mr. John O'N. McClintock, Professor C. H. G. Macafee, Mrs. F. A. McMullan, Lord O'Neill, Messrs. Robertson, Ledlie and Ferguson, the Ulster Medical Society and the Ulster Museum (Magowan Collection) for Fig. 7.

A FOLLOW-UP STUDY OF ONE HUNDRED CASES OF STERILIZATION BY TUBAL LIGATION

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IN THE Royal Maternity Hospital and the Gynaecological Department of the Royal Victoria Hospital, Belfast, as at other hospitals, the operation of tubal ligation is being performed more readily and in greater numbers than previously. In 1963 fifteen were done, in 1967, one hundred and twenty-six. It is becoming less a matter of medical necessity and more a matter of personal choice and it was therefore thought that it would be interesting to follow up the women who had had this operation performed. The primary interest has not been in the techniques of operation and their relative efficacy but in patient reaction to the operation, including how well prepared by previous discussion the patient and her husband were, whether any regrets were experienced and whether there were any differences noted afterwards in the circumstances of the woman, the couple or the family.

Methods and Material

The details of past history and operation were extracted from patient records and each patient was written to a year or more after operation and asked to come to hospital for interview. If she did not reply on the card provided she was sent a second appointment and if there was again no reply the local health visitor called on her to try to persuade her to attend. It did not prove possible to see those patients who lived outside Belfast, so the follow-up is limited to the Belfast area. One hundred and thirty patients were written to; 25 did not attend after a second appointment and usually a visit; 5 could not be traced.

The patients were all interviewed by one person according to a standard questionnaire and no physical examination was done as it appeared that the thought of this would deter some women from coming. If they needed or requested examination they were referred to the gynaecological out-patient department.

One hundred patients were interviewed. Their parity ranged from 1 to 7 with an average of 5·6. Their age range was 21 to 45 years with an average of 32·7. The time since operation was 1–2 years in 95, 2–6 years in 4 and 10 years in 1 case.

Many patients had more than one reason which reinforced the decision to sterlize. Sixty-one had some medical reason, e.g. heart condition, rhesus incompatibility, recurrent toxaemia or hypertension; 41 were grand multiparae; 14 had had repeat Caesarian sections; 25 had had a failure of contraception. This last includes distaste for, or unpleasant side effects due to, method as well as unplanned pregnancies. Seven patients had some psychological reason. Fifty-five patients had deferred or interval operations and of these 21 were by the abdominal and 34 by the vaginal route. Twenty-nine patients had an abdominal operation in the puerperium and 16 had their tubes ligated at abdominal delivery, including 4 at hysterotomy. The Pomeroy type of operation was almost always used. Sixteen patients had post operative complications which were as follows:

4 wound infections or breakdown (3 interval abdominal and 1 hysterotomy)
4 deep vein thromboses (2 puerperal and 2 Caesarian sections)
1 chest infection (interval abdominal)
6 urinary tract infections (5 vaginal and 1 interval abdominal)
1 pelvic inflammatory disease (vaginal).

These figures are not large enough for definite conclusions, but it would appear that the more serious complications occur in the abdominal operations and puerperally.

Results of Interview

The operation was suggested by a doctor in 87 cases (16 general practitioners, 14 family planning clinic doctors, 57 hospital doctors). Only 13 patients initiated the idea of sterilization themselves. Twenty-seven husbands were interviewed by a doctor, which seems very few when the joint concern of fertility is being considered. The husband did, of course, sign consent in all cases, but often only as a formality when his wife was admitted to hospital and in 63 cases only nursing staff interviewed him.

In the latter half of the study it was specifically asked if patients thought they had had sufficient explanation and discussion. It was also asked if they had used contraceptives. Thirty-five out of 55 asked were satisfied with the explanations, though in fact many of these seem to have had only a sketchy account but did not want to know more. Twenty felt they were not told enough. Of 44 asked about contraception 11 had never used any method, 23 had only tried one method, 9 had tried 2 methods and only one had tried 3 or more.

All patients were asked if they were pleased that they had had the operation and the great majority were unreservedly so. Many spoke in glowing terms of the difference it had made to their individual and family lives. Altogether 93 said they were pleased and of these 4 (all done puerperally) had had some initial regrets and doubts, but none by the time they were interviewed; a further 7 of the 93 still occasionally had fleeting regrets but were really pleased on the whole. Four definitely regretted the operation and the details of these are as follows:

Case 1. Age 33. Para. 3+1. Under psychiatric treatment. Tubal ligation and hysterotomy. Her regrets were tied up with guilt feelings about the abortion although at the time she wanted both operations. She requested referral to the gynaecologist to discuss a possible reconstruction operation.

Case 24. Age. 28. Para 7. Interval operation. She blamed the operation for menorrhagia and complained of loss of femininity. She had an unstable marriage and her husband had been in and out of mental hospitals before and since the operation.

Case 61. Age 31. Para 4+2. Rhesus negative. Puerperal operation. At interview her strong maternal feelings and equating of fertility and femininity emerged. Her sex relations had deteriorated and she felt intercourse was wrong if there was no chance of pregnancy following. She had had very little time for reflection over her decision.

Case 73. Age 24. Para. 4. Interval. Two severe post-partum haemorrhages. This patient was deaf and of low I.Q. and did not fully understand the implications of the operation and now wanted another child. Her sex relations had also deteriorated for similar reasons to Case 61.

In addition to these 4 there were 3 who were ambivalent in their reaction to the operation and one of these became pregnant after she had been interviewed.

Case 17. Age 27. Para. 2. Mitral stenosis and bronchiectasis. Interval. She regrets her inability to have further children. It is not a very happy marriage and there seems little communication between her and her husband.

Case 25. Age. 31. Para. 7. Interval. No additional medical reasons. She had some feelings of guilt and loss of femininity. She had had insufficient explanation: she was surprised to continue menstruating and was actually very pleased that she did.

Case 18. Age 27. Para. 4+1. She had originally wanted another child but had not conceived and after this decided against pregnancy and took oral contraceptives for a time. Her family doctor sent her to gynaecological out-patients with some minor complaint and tubal ligation was suggested to her and she agreed. When she was seen about a year after the operation she was partially regretting it and gazing enviously into other people's prams. Soon after this she became pregnant – to her slight, and her husband's considerable, annoyance and he threatened to sue the surgeon concerned. She is now delivered and on oral contraceptives and awaiting hysterectomy.

Patients were also asked if any differences were noted in personal and family health and in sex relations. These were, of course, subjective observations. In personal health, 36 felt better, 7 felt worse and 57 noted no change – of the 7 who felt worse, 2 were of the 4 who regretted the operation, 3 had had some mild depressive illness since, 1 had Hodgkins disease and had deteriorated and 1 had some menstrual disturbance. Many of those who thought their health improved spoke of improved "nerves" and some had stopped taking tranquillisers and had not needed to visit their family doctors since.

It is not easy to assess family situation but 20 patients thought it had improved and some volunteered how much more patience they had with their children and others said they had been able to start part-time work so that family finances improved and children could stay on at school beyond leaving age. None thought the family situation any worse.

In sex relations, 40 thought them improved, 16 worse and 44 said there was no change, which means they might be equally bad or good. Those who spoke of improved relations gave reasons such as removal of anxiety over pregnancy and relief at no further need of contraceptives. It is difficult to give accurate reasons for deterioration, though several women expressed something like the one who said she had "lost the excitement of getting away with it every month".

Finally, patients were questioned about any changes in menstruation as to frequency, regularity, pain or loss. More than 70 had no change in the first three; loss was increased in 33 and decreased in 15. The changes, therefore, are not great and correspond to other follow-up series (Adam; Sacks and Delacroix).

Discussion

When this follow-up study was begun there was not much literature on the emotional aspects of this subject, and what existed was not strictly comparable. There is a large U.S. literature comparing techniques and results, though Adams (1964) included a questionnaire on reactions and Barnes and Zuspan (1958) record the results of interviews carried out by a social worker.

Ekblad (1961–62) in Sweden produced a very careful follow-up study of 225 women who had been sterilized, but 85 per cent of these had had the operation at the same time as a therapeutic abortion, sometimes as a condition of abortion – so that the situation is not comparable. Even so, he found that 78 per cent were wholly satisfied and only 7 per cent had serious regrets.

More recently Lu and Chun (1967) in Hong Kong published a follow-up of 1,055 puerperal tubal ligations. Black and Sclare (1968) have reported a gynaecological and psychological assessment of 168 patients 1–5 years after operation in Glasgow,

where the situation is very similar to Belfast and Thompson and Baird (1968) have published their follow-up findings in Aberdeen. The overall result of these studies is the great effectiveness and acceptability of the operation. Most authors consider that on the whole it is better done in the woman of 30+, para 3+, and that the unstable person or marriage is probably not improved.

This series too shows that for the great majority of women operated on, tubal ligation is of great benefit. They mostly have improved or unchanged health, family and marital life and experience no great change in menstrual pattern. What comes out clearly is the need to give considerable time to talking to these patients and, if possible, their husbands too, both to try to assess their possible reactions and make it quite clear what will be done at operation and what to expect afterwards. Although a number of women did not mind the husband being consulted only through them, others felt he should have been involved in discussions and explanations. Time should also be allowed for the couple to make a decision. Several rather "rushed" puerperal operations gave rise to some regrets. Numbers are not sufficient to justify the impression that interval tubal ligations may be less likely to cause regrets, and there are arguments for convenience in doing the operation in the puerperium. Nevertheless, it is a time of emotional instability and if the operation is to be done then it should be discussed carefully during the antenatal period. It is important to warn patients of the tales they may hear about failure rates and especially the recurrent legend that the operation only lasts for seven years. They also need to discuss the subject of sex relations after the operation which most people want to know about but not all enquire about. It seems probable that unstable personalities are not improved by the operation, but there is something to be said for preventing further children being born into these families.

Summary

One hundred patients who had had tubal ligation performed were interviewed to assess their reactions to the operation, mostly up to 2 years afterwards. Ninety-three were pleased they had had the operation, 4 regretted it, and 3 were ambivalent. There was one pregnancy. The general health was improved in 36, unchanged in 57; the family situation improved in 20, unchanged in 80; sex relations were improved in 40, unchanged in 44, worse in 16. In 36 per cent there was insufficient explanation or discussion and only 27 per cent of husbands were interviewed by a doctor.

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LEPROSY—A CLINICAL AND PATHOLOGICAL CHALLENGE

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The A. B. Mitchell Memorial Lecture given in Belfast at the invitation of the Senate of the University of Belfast on 11th May, 1967

I SHOULD first wish to pay tribute to, and honour the memory of, a distinguished surgeon – a man of broad interests, a dogmatic teacher of no mean ability, an administrator with a social conscience. In this spirit, and conscious of the privilege that is mine of being invited to follow in this Lectureship some very eminent medical men, I make bold to suggest for consideration a topic that would have fascinated and intrigued its founder, A. B. Mitchell. From what I can gather, he enjoyed getting his teeth into problems that seemed at first sight too big for him.

The topic before us is: *"Leprosy – a clinical and pathological challenge"*. Before we consider what leprosy is, we should say what it is not, thereby removing some misconceptions and misunderstandings, and demolishing some cherished idols and pseudo-scientific folklore enshrined in medical text books and Bible dictionaries. Leprosy is not a highly contagious infection. It is not an invariably progressive disease, leading inevitably to mutilation and deformity. It is not a disease that is virtually incurable, one in which the fingers and toes drop off. It is not a mysterious condition somehow associated with Divine punishment for wrongdoing or ceremonial uncleanness, or with ritual defilement. It is not a condition invariably associated with poverty or beggary, or with dirt and squalor. It is not a fearful combination of the supposed incurability of cancer, the contagiousness of tuberculosis and the shame of venereal disease.

If leprosy is none of these things, what is it? It is a slightly contagious disease, caused almost certainly by a mycobacterium of low pathogenicity that has weak powers of invasion. It is usually self-limiting and self-healing. It is endemic in cold as well as in hot countries. It is characterized not only by disfiguring hypopigmented skin patches and nodules and by invasion of the mucosa of the upper respiratory tract, but also pre-eminently and most importantly by damage to the peripheral nerves. It is not necessarily associated with dirt, poverty, overcrowding or poor hygiene, although each of these factors may have something to do with its spread, or with its persistence in any one focus. It is, of course, unassociated with venereal transmission, and should bear no connotation of shame.

Clinically and pathologically, leprosy is several conditions, and as such it presents a continuing challenge to those interested in disease and sequelae of disease, in human suffering and in economic loss. It is, firstly, an infection by *Mycobacterium leprae* of the dermis, the mucosa of the upper respiratory tract and the peripheral nerves. It is of insidious onset, and the source of infection is often unknown. The disease itself is characterized by extremely slow progress. Leprosy is

not a very serious disease from the public health standpoint : it does not appear in sudden epidemics, and it carries no high mortality.

Leprosy, however, is not only a mycobacterial infection: it represents, secondly, the summation of a variable cellular response to infection. On the one hand, bacilli may be very scanty, multiplying apparently with great difficulty; the presence of rare bacilli is accompanied by a vigorous cellular reaction. On the other hand, there may be an enormous parasitization of the reticulo-endothelial cells of the dermis, and a bacillary invasion of all the peripheral nerves. It is the host-response to the infection that determines the nature of the clinical disease.

In the third place, leprosy represents the mechanical – rather than the toxic – effects of this response. Tuberculoid leprosy is characterized histopathologically and clinically by a progressive destruction by fibrosis of sweat glands, pigment-forming cells of the basal layer of the epidermis, hair follicles, nerve endings and nerve fibres; at length, when the granuloma involves the reticular layer, the fibrotic constriction of important structures leads to functional ablation. This latter type of destruction occurs, for example, in a superficial nerve immediately subjacent to a minor tuberculoid lesion, and necessarily partakes in the localized fibrosis following a vigorous cellular response to paucibacillary infection; or in the nasal duct involved in a progressive fibrotic process with consequential epiphora and ulceration of the facial skin. Extremely numerous bacilli may be aggregated together in masses of Virchow, lepra or foamy cells, the whole protruding as a lepromatous nodule. Such masses of highly bacilliferous granulomata may be present diffusely in the dermis or in the mucosa of the upper respiratory tract. There are smaller and clinically less important aggregations in the liver, the bone marrow and the spleen.

It is in the peripheral nerves that the fibrosis following degeneration of mycobacteria has its most serious and far-reaching consequences. Enormous numbers of viable and morphologically normal mycobacteria may exist and multiply between the fibres of the peripheral nerves without provoking an inflammatory response, but when these bacilli degenerate and attract an outpouring of lymphocytes with an accompanying oedema, nerve pathways may be temporarily interrupted or permanently destroyed.

In the fourth place, leprosy may be regarded as the peripherally distant results of this temporary or irreversible damage to nerve fibres; these results primarily interest the surgeon – the plastic and orthopaedic surgeon, and the ophthalmic surgeon. Partial pareses and complete paralyses develop in the intrinsic muscles of the hands and feet, and in the facial muscles. Paraesthesiae and areas of numbness that are persistent or localized or recurrent, may precede total sensory anaesthesia. The first modality to be lost is usually that of light touch. Heat and cold soon follow, and then pain. The deep reflexes are usually retained, as are muscle and joint sense and vibration sense in bone. Notwithstanding the very extensive and severe sensory loss, stereognosis is often retained to a surprising degree. Changes may occur in the calibre of blood vessels, in local reflexes on stimuli, in pigment formation and in sweating in the direction of hypo- or hyper-idrosis.

In the fifth place, leprosy may be regarded as demonstrating the phenomena of tissue sensitization, or as the manifestations of an antigen-antibody reaction. In this respect leprosy has many features suggestive of auto-immune disease, and its

neuropathy is reminiscent of the polyneuritis of Guillain-Barré. Other possible examples of hypersensitive phenomena are to be seen pre-eminently in the iris and ciliary body, and in the subcutaneous tissues; in the latter the manifestations may be classed as those of erythema nodosum leprosum, the lesions of which may be discrete and acuminate, or a more diffuse, generalized and coalescent panniculitis. This is accompanied in severe cases by inflammation of the lymph nodes, by polyarthritis going on to effusion into the medium-sized joints, by acute anaemia and gynaecomastia, sometimes associated with orchitis and testicular atrophy. Such systemic symptoms as pyrexia, severe malaise, and pain in nerves, muscle masses and joints, coupled with the presence of C-reactive protein in the serum, cryoproteins, increased gamma-globulin, and (occasionally) LE cells – all suggest some complex disturbance of the body response-system.

Lastly, leprosy may be regarded not only as any or all of the above manifestations of a disease process, but also as an attitude of mind – in the patient and his entourage, in society, in governments and legislative bodies. There are countries where this aspect of leprosy is its most important feature, outweighing in seriousness the controllable contagion caused by *Myco. leprae*. Attitudes, misconceptions and prejudices are often more difficult to change and eradicate than physical entities.

Wherein lies the clinical challenge of leprosy?

Leprosy is overlooked or wrongly diagnosed, with great frequency. The time-lag between the first sign and correct diagnosis is often several years. Since all patients at present under treatment in Great Britain have contracted the disease abroad, leprosy should be considered in the differential diagnosis of any dermatosis or neuropathy in anybody who has travelled out of the country, and especially in contacts of known cases. We should think of leprosy when faced with any obscure dermatosis – or any chronic non-irritating skin condition that either does not resemble one of the commoner categorized dermatoses or fails to respond to usually effective treatment. A peripheral neuritis whose aetiology is not apparent, and especially if accompanied by some kind of skin rash, may be due to leprosy.

The positive signs of diagnosis of leprosy may be summarized as follows: a localized area of skin showing altered pigmentation, impaired tactile sensibility, loss of sweating, disturbance of hair growth, and, of course, the presence of *Myco. leprae*. If the practitioner awaits all these conditions – or the majority – he will fail to diagnose early leprosy and even the advanced disease. The earliest stages may be represented by vague prodromal symptoms of paraesthesiae, evanescent lesions and, very importantly, self-healing lesions.

The second aspect of the clinical challenge of leprosy concerns the differential diagnosis of the disease. This is too vast a subject to discuss fully. Leprosy may be – and very often is – confused with almost any dermatosis, with congenital conditions, with skin infections and neoplasms. One very common neurological sign in leprosy, almost pathognomonic, is frequently overlooked. The peripheral nerve trunks, especially at sites of predilection, where they course superficially or near joints, are enlarged and hard and tender. This sign, confined to one nerve or present in all the main peripheral nerve trunks, is encountered very infrequently in such rarities as: generalized amyloidosis of nerves, and Déjerine Sotta's disease (Thevenard's syndrome, or congenital hypertrophic familial polyneuritis). In cases of congenital indifference to pain, the nerve trunks are clinically normal.

The third aspect of this challenge concerns the acute exacerbation of lepromatous leprosy, characterized by a more or less sudden appearance, and a more or less prolonged persistence, of features of the hypersensitive state. Many fundamental questions concerning pathogenesis and treatment remain unanswered. In the case of acute irido-cyclitis, or sudden widespread and severe polyneuritis, the clinical results are serious and may be permanent.

The fourth aspect of this challenge concerns the nerve damage in leprosy. Why the predilection for peripheral nerves, and the sparing of the central nervous system? Why the damage to certain modalities, or to certain levels of the nerve? The clinical impairment may be mainly motor or mainly sensory, or any combination of the two and to any degree. The affection may be transient or permanent. The auto-sensitization of nerve tissue by products of nerve damage, and the enhancement of a non-specific effect by extracts obtained from other mycobacteria, are two aspects of this problem that may have important bearings on the pathogenesis of auto-immune disease in general.

These considerations have a bearing on the practical problems confronting the surgeon, problems such as acute foot-drop, sudden orbicularis paralysis, other paralyses, deformities, contractures, ulceration of anaesthetic extremities, etc. All these conditions would be preventible if only leprosy were diagnosed early and treated properly. Moreover, at whatever stage active leprosy is encountered in the individual patient, further damage to nerves and the consequences of such damage may be corrected by judicious application of known surgical principles.

An indispensable adjunct to surgery is physiotherapy; in point of fact, the actual surgical intervention may be regarded as an interlude in the prolonged and exacting task of the physiotherapist who not only aims at restoring paresed muscles to useful function and re-educating the patient, e.g., after tendon-transfer operations, but who plays an important role in counselling the patient to care for his anaesthetic extremities.

Another valuable member of the team is the shoemaker, who utilizes locally available materials and locally available skills to produce cheap and durable and acceptable protective footwear. The splint and brace-maker and the prosthetist complete the team as far as physical restoration and rehabilitation are concerned.

The damage done by leprosy, however, must be considered also in relation to its mental, social and even its spiritual aspects. These together constitute a tremendous challenge to those whose objective is the restoration of the individual sufferer to integrity and usefulness as a person in his community.

The Pathological Challenge

The problems in leprosy awaiting solution are of importance not only to the study of leprosy itself and to related mycobacterial infections, but also to general medicine and surgery, to epidemiology, immunology and bacteriology. Their solution depends in turn upon advances in related branches and upon the utilization of modern investigative aids and tools. The cross-fertilization of ideas that produces results could come from research workers now tackling problems in related disciplines (such as tuberculosis or auto-immune disease). In the past, leprologists have unfortunately been isolated and segregated from their fellows. Let us glance briefly at some of these pathological challenges.

Firstly, although the leprosy bacillus was one of the first micro-organisms to be cited as the cause of human disease, it has not yet been cultured *in vitro*.

Secondly, until recently it has been impossible to reproduce in the experimental animal a generalized progressive granulomatous disease.

Thirdly, the fundamental questions of resistance and susceptibility await solution : the exact significance of the Mitsuda test in this connection is still obscure, and potential response to mycobacterial antigen injected intradermally may not also indicate potential resistance if the subject should be challenged by leprosy infection.

In the fourth place, the transmission of leprosy provides another series of pathological problems still unsolved. The sole orthodox nidus of *Myco. leprae* is human tissue, but its existence in fomites or its persistence after being shed outside the human body has not been demonstrated. Viral forms or L-forms may indeed exist, whose importance in the transmission of leprosy is quite unsuspected. The actual inoculation and implantation of the bacillus also provides many unanswered questions. The long silent, or latent, or incubation period of several years awaits elucidation. (A partial explanation, of course, resides in the prolonged generation time of this bacillus, probably a matter of two or three weeks). Why does the leprosy bacillus invade the tissues apparently with ease in some patients and fail to establish itself in others? Is susceptibility genetically determined? Does it depend upon an initial unnoticed inoculation, which results in a tissue hypersensitivity? Is a positive lepromin test associated with infection by related mycobacteria, named or anonymous?

In the fifth place, skin hypersensitivity in leprosy has intriguing parallels with granulomata produced by beryllium, zirconium and silicon, and with antigenic extracts of liver, skin, etc.

Then there is the range of sarcoid phenomena in lymph nodes, skin, eye, bone, etc. Other mycobacterial infections show some resemblances to the chronic granulomata caused by or associated with *Myco. leprae* : tuberculosis, swimming-bath granuloma, Buruli ulcer (*Myco. ulcerans sp.*), Stefansky's infection in rodents, and infection by related mycobacteria in water buffalo, wood-pigeons, salmon, frogs, snakes, etc.

I may now refer to recent experimental work that is furnishing some long-awaited answers to these and other questions. The inoculation of leprosy bacilli into the footpad of the mouse will result in mathematically demonstrable multiplication of the bacilli after a prolonged period (to be correlated with the prolonged generation time of the bacillus). This elegant demonstration of a localized bacillary multiplication is not to be confused with generalized mycobacterial granulomatous disease, but it does provide definite evidence that *Myco. leprae* is viable and can multiply within the special conditions of the biological experiment.

This technique is now being used as a screening procedure, to demonstrate the activity of drugs, drug-resistance, and the enhancement of resistance to leprosy by B.C.G. inoculation. The minimal inhibitory doses of standard drugs employed in leprosy can be determined, and, in fact, the method has shown that such drugs as dapsone and B 663 (Geigy), a phenazine derivative, are potent in extremely low concentrations.

It has recently been demonstrated that thymectomized mice who have been

exposed to high doses of whole body irradiation (900 r) will develop a generalized granulomatous disease after inoculation with *Myco. leprae*. The granulomatous masses contain morphologically normal *Myco. leprae* surrounded by a cellular exudate and infiltration that is comparable with that seen in the human subject with lepromatous disease.

Much work is also proceeding on the changes in the serum consequent upon leprosy infection. The gamma-globulins are increased, and cryoproteins have been recently demonstrated. This subject presents a considerable challenge to the biochemist and the immunologist. The common antigenic pattern of several related mycobacteria has been demonstrated by biochemical and immunological methods.

Conclusion and Summary

Such is leprosy, one of the earliest human infections to be associated with a specific micro-organism – and one of the latest to yield its secrets to research. Surrounded by more superstitution and prejudice than any other condition known to medical science, leprosy still constitutes a tremendous challenge, clinically and pathologically, scientifically and socially. It is the world's greatest crippler, yet it has received but scant notice on this count. It is the last of the great infectious endemics to reveal its mode of transmission and many of its epidemiological secrets. Although five millions have been cured of leprosy within the last twenty years, there are fifteen millions who suffer today, and within the next five years another million will probably develop leprosy and another quarter of a million will become crippled because of leprosy. This constitutes a clinical and pathological challenge that would have stirred the scientific and humanitarian heart of A. B. Mitchell.

N.B. Rather than overload the lecture with numerous references to the literature, I would direct attention to recent issues of *The International Journal of Leprosy and other Mycobacterial Diseases*, *Leprosy Review*, and the monthly abstracts and annual reviews appearing in *Tropical Diseases Bulletin*. Nearly all significant research work in leprosy finds its way into one or other of these publications.

FRACTURES OF THE FEMORAL NECK

Some Aspects of Management in a Fracture Unit

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THE CLINICAL management of fractures of the femoral neck in the elderly varies from centre to centre and the medical and nursing problems are considerable. This retrospective analysis of the work in a fracture unit tends to confirm already well known facts and attempts to analyse several aspects of the problems involved.

METHODS

The case notes were obtained from the Belfast City Hospital Records Department and the information coded. The code was transferred to punch cards which were automatically sorted and the results tabulated.

RESULTS

During the eleven-year period 1957–1967, the case records of 495 patients with fracture of the femoral neck were available for study. There were 120 male and 376 female cases; one female patient had fractures of both femora at different times and therefore there were 496 fractures included in the series. The diagnosis was confirmed radiologically in all cases. Fig. 1 shows the age distribution of both male and female patients combined. Fig. 2 separates the sexes by age, revealing a distinctly different pattern. Fig. 3 shows the distribution of the patients by year of admission, the fracture unit having first opened in 1957.

There were 242 cases with fractures of the right femur and 254 of the left femur. (This includes the patient with both hips fractured). Age and sex had no significant effect on which side was affected, except for females between 80 and 85 years when there were a third more right-sided fractures. Three hundred and eleven intracapsular fractures and 185 extracapsular fractures were recorded.

Of the 496 fractures, 368 (74·19 per cent) were treated by open operation, and Table I shows the distribution of the types of initial treatment of the 495 patients. Intracapsular fractures were usually treated operatively either by Smith Petersen nailing (most frequently in the under-70 age group) or by femoral head replacement with the Austin Moore prosthesis (most frequently in the over-70 age group) as in Table II. Blade plates were used in patients with extracapsular fractures. Patients unfit for operation were treated conservatively using Hamilton Russell type balanced traction.

The *complications* were subdivided into local – that is, related to the fracture and the technical procedure – and general – those related to other body systems. Details

TABLE I

Distribution of 494 patients by side of fracture and type of treatment

Side of fracture	Type of Treatment				*Total*
	Conservative	*Smith Petersen fixation*	*Blade plate fixation*	*Femoral head replacement*	
Right	59 (24·58%)	69 (28·75%)	68 (28·33%)	44 (18·33%)	240
Left	67 (26·38%)	58 (22·83%)	72 (28·35%)	57 (22·44%)	254
Total	126 (25·51%)	127 (25·74%)	140 (28·34%)	101 (20·45%)	494

One case had a right-sided arthrodesis.
Another right-sided case was admitted a year after a Smith Petersen pin for revision osteotomy, making a total of 496 cases.

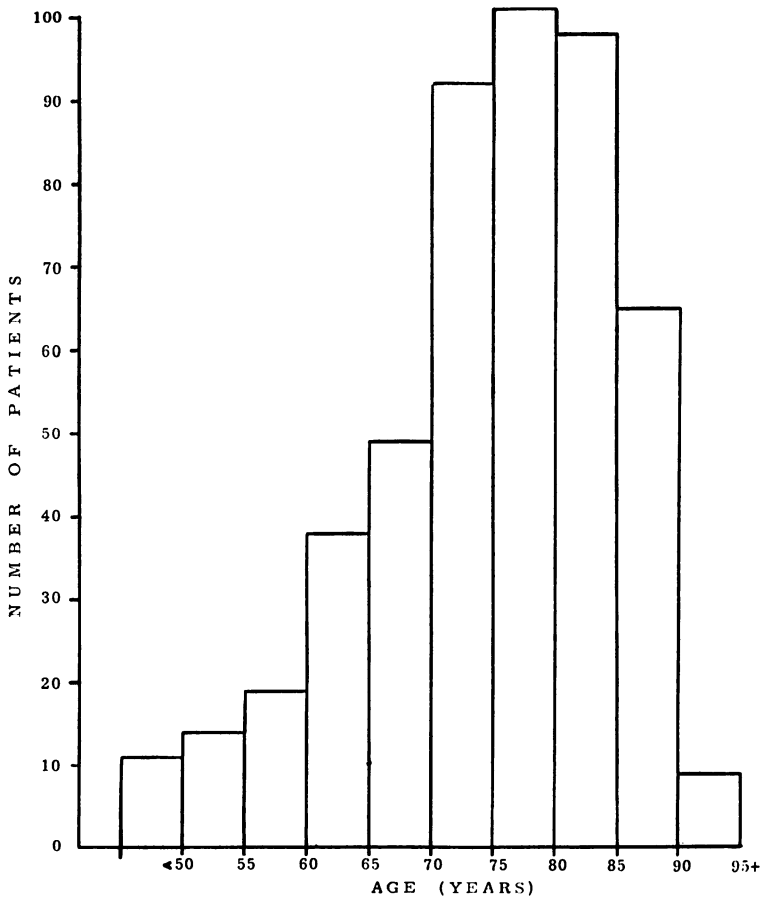

FIG. 1. *Distribution of 495 patients by age.*

TABLE II

Distribution of 228 patients by age and operative treatment of intracapsular fractures

Age group (years)	*Internal fixation (Smith Petersen pin)*	*Femoral head replacement (Austin Moore prosthesis)*	*Total*
Below 50	3 (75·0%)	1 (25·0%)	4
50–54	6 (85·71%)	1 (14·29%)	7
55–59	10 (90·91%)	1 (9·09%)	11
60–64	18 (85·71%)	3 (14·29%)	21
65–69	19 (79·17%)	5 (20·83%)	24
70–74	20 (46·51%)	23 (53·49%)	43
75–79	20 (44·44%)	25 (55·56%)	45
80–84	20 (43·48%)	26 (56·52%)	46
85–89	10 (41·67%)	14 (58·33%)	24
Over 90	1 (33·33%)	2 (66·66%)	3
Total	127 (55·70%)	101 (44·30%)	228

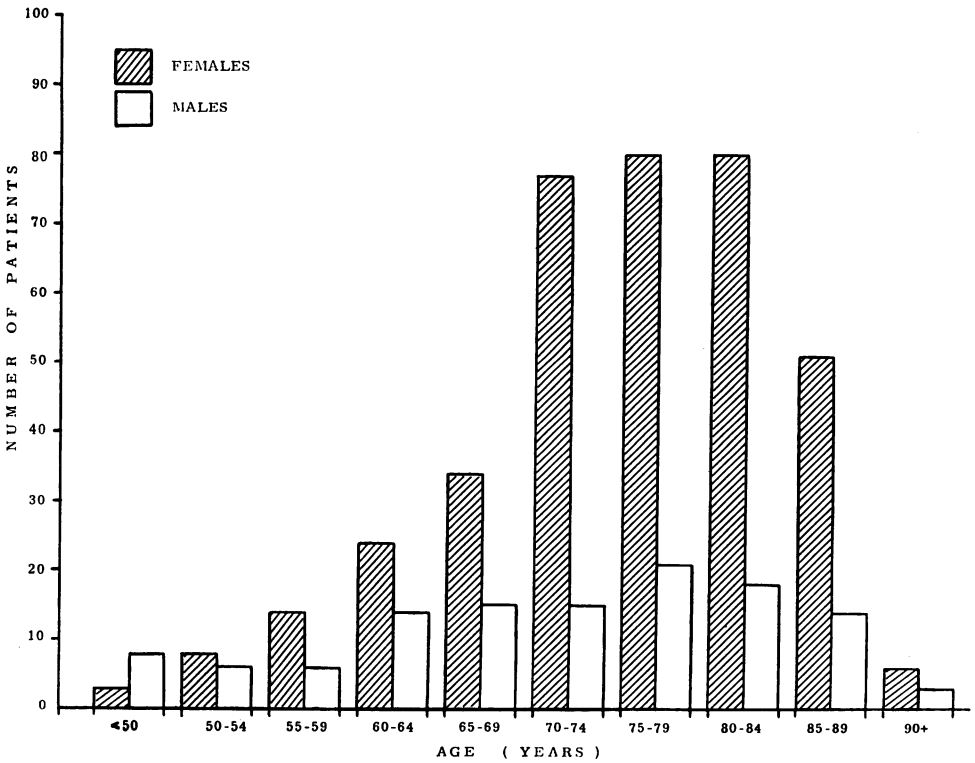

FIG. 2. *Distribution of 495 patients by age and sex.*

of the general complications were not always fully recorded and therefore difficult to code but overall mortality during the period in hospital was 72 patients out of 495 (14·55 per cent). When the mortality was related to the type of treatment (Table III), the greatest proportion (30·16 per cent) of deaths occurred in the conservatively treated group, i.e., those rejected as unsuitable or not treated by surgery. The hospital mortality rates of patients treated by blade plate and femoral head replacement arthroplasty procedures were similar (10·00 and 14·85 per cent respectively). The slightly higher mortality of the femoral head replacement procedure is to be expected as the patients are in an older age group. The Smith Petersen pin procedure had the lowest hospital mortality (3·94 per cent) in this series but naturally involved a younger age group. The actual cause of death was not always accurately recorded but pulmonary embolism, congestive heart failure and bronchopneumonia headed the list.

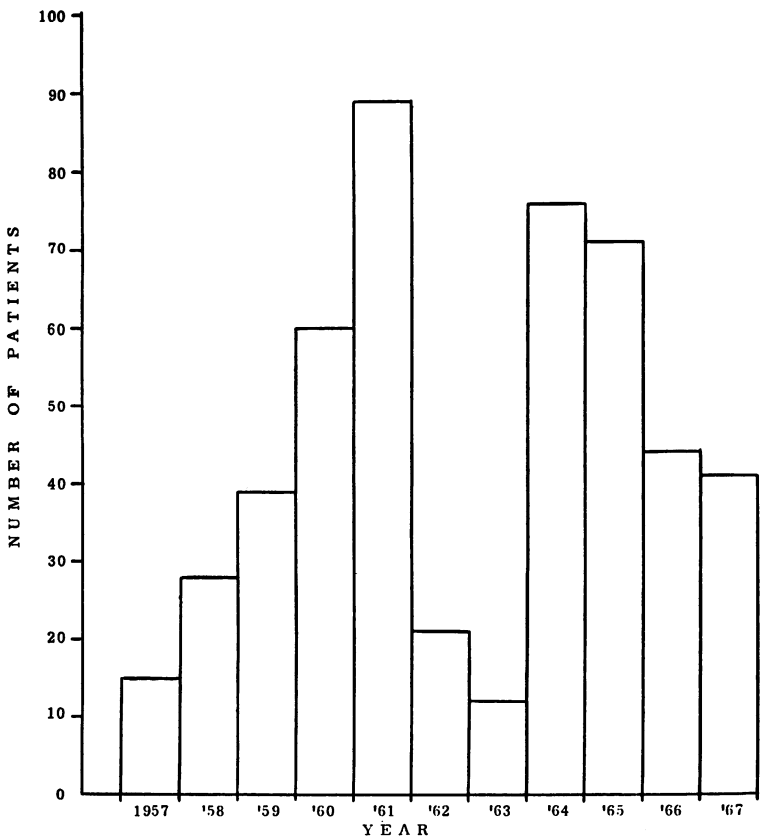

FIG. 3. *Distribution of 495 patients by year of admission.*

TABLE III

Distribution of patients by the type of treatment and the patients who died in hospital

	Type of Treatment				
	Conservative	*Smith Petersen nail fixation*	*Blade plate fixation*	*Femoral head replacement*	*Total*
Number of patients	126	127	140	101	494
Number of patients who died in hospital	38	5	14	15	72
(% of total in each treatment group)	(30·16%)	(3·94%)	(10·00%)	(14·85%)	(14·57%)

One case had an arthrodesis.

Another right-sided case was admitted a year after a Smith Petersen pin for revision osteotomy, making a total of 496 patients.

TABLE IV

Distribution of 54 patients with general medical complications

Type of general complication	*No. of patients*
Respiratory infections	15
Cardiovascular disease	11
Cerebrovascular disease	18
Urinary infections	9
Neoplasia	1

TABLE V

Distribution of patients with local postoperative complications by type of treatment

Type of local complication	*Smith Peterson nail fixation*	*Blade plate fixation*	*Femoral head replacement*
Non-union	2	0	0
Avascular necrosis	4	0	0
Infection – superficial	1	2	1
– deep	0	1	6
Fractures	1	0	1
Dislocation	0	0	3
Extrusion of nail, breaking of metal, incorrect placement	27	5	1
Total No. of complications	35 (27·56%)	8 (5·71%)	12 (11·88%)
Total No. of patients in each group	127	140	101

TABLE VI

Distribution of 288 patients by the period of immobilisation and by treatment

Period in weeks	TYPE OF TREATMENT				*Total*
	Conservative	*Smith Petersen nail fixation*	*Blade plate fixation*	*Femoral head replacement*	
1	19 (10·16%)	50 (26·74%)	49 (26·20%)	69 (36·90%)	187
2	8 (33·33%)	5 (20·83%)	4 (16·67%)	7 (29·17%)	24
3	5 (38·46%)	2 (15·38%)	5 (38·46%)	1 (7·69%)	13
4	7 (46·67%)	1 (6·67%)	6 (40·00%)	1 (6·67%)	15
5	4 (80·00%)	1 (20·00%)	0 –	0 –	5
6–13 or more	36 (81·82%)	2 (4·55%)	3 (6·82%)	3 (6·82%)	44
Total	79 (27·43%)	61 (21·18%)	67 (23·26%)	81 (28·13%)	288

Of the patients who were discharged from hospital, 54 (12·8 per cent) had some major medical complication during inpatient treatment (Table IV).

Table V shows the distribution of the local complications following operation. The period of time over which these postoperative complications have been recorded varies from patient to patient. As this is purely a retrospective analysis, long-term follow-up of patients has not been included in this inquiry and the details of complications have had to be limited to those recorded during the period of time that the patients attended the clinic postoperatively. Of the 127 patients treated by Smith Petersen nailing, 35 demonstrated a complication with initial treatment – i.e., extrusion of nail, non-union, avascular necrosis, etc. Of these, 22 (62·86 per cent) were submitted to replacement arthroplasties using the Austin Moore prosthesis, displacement osteotomies in five (14·28 per cent) cases, arthrodesis in one (2·86 per cent) case, while the salvage procedure was not recorded in seven patients (20·0 per cent).

Six patients (5·94 per cent) with intracapsular fractures treated by femoral head replacement using the Austin Moore prosthesis developed postoperative deep infection. This complication was treated by removal of the prosthesis and appropriate antibiotic therapy. Three patients (2·97 per cent) with Austin Moore arthroplasties underwent dislocation while the stem of one prosthesis (0·99 per cent) extruded through the trochanter due to improper insertion.

The *period of immobilisation* in bed was recorded in 288 patients (Table VI). It is noted that the proportion in each treatment group was closely similar to that in the original 495 patients (Table I). As might be expected, patients treated conservatively, that is with Hamilton-Russell type traction, spent much longer in bed than those who underwent operation. Earlier mobilisation was recorded in patients treated by femoral head replacement as compared to other forms of surgery.

The *period of hospitalisation* was recorded in 485 patients; of these, 72 died while in hospital. The distribution of all patients is seen in Table VII. It is noted that a number of patients – the proportion is not known – left hospital in the first few weeks even if they had been operated upon; this can be explained by early transfer

TABLE VII

Distribution of 485 patients by the length of stay in hospital and the type of treatment
The distribution of 72 hospital deaths is shown in parenthesis

	Type of Treatment								
	Conservative		*Smith Petersen nail fixation*		*Blade plate fixation*		*Femoral head replacement*		
Period in hospital (weeks)	*Total No. patients*	*(Hospital deaths)*	*Total No. patients*	*(Hospital deaths)*	*Total No. patients*	*(Hospital deaths)*	*Total No. patients*	*(Hospital deaths)*	*Total*
1	23	(17)	2	(1)	2	(1)	11	(2)	38
2	7	(4)	3	(1)	12	(3)	9	(2)	31
3	7	(3)	9	(0)	6	(0)	20	(4)	42
4	10	(2)	11	(0)	8	(1)	20	(1)	49
5	5	(3)	11	(1)	5	(1)	12	(0)	33
6	3	(1)	13	(0)	12	(0)	3	(1)	31
7	6	(2)	9	(0)	11	(1)	5	(0)	31
8	8	(0)	15	(1)	28	(1)	6	(1)	57
9	4	(1)	7	(0)	6	(0)	2	(1)	19
10	5	(0)	11	(1)	15	(1)	3	(2)	34
11	7	(2)	5	(0)	2	(0)	0	(0)	14
12	13	(0)	12	(0)	8	(1)	2	(0)	35
13	0	(0)	1	(0)	7	(0)	0	(0)	8
14	5	(0)	2	(0)	2	(0)	2	(0)	11
15	2	(0)	2	(0)	1	(0)	0	(0)	5
16	8	(0)	1	(0)	3	(1)	0	(0)	12
17	3	(0)	2	(0)	1	(0)	0	(0)	6
18	10	(3)	9	(0)	7	(3)	3	(1)	29
Total	126	(38)	125	(5)	136	(14)	98	(15)	485(72)

to the referring hospital for postoperative convalescence. From this table the average length of stay in hospital has been calculated by the type of treatment and the results shown in Table VIII. Patients transferred have been included in this table but those who died in hospital have been excluded. As might be expected those treated conservatively stayed longer and the interesting feature is the relatively short period recorded for patients treated by femoral head replacement.

TABLE VIII

The average length of stay in hospital measured in weeks by type of treatment
(After exclusion of 72 hospital deaths)

Conservative	*Smith Petersen nail fixation*	*Blade plate fixation*	*Femoral head replacement*
10·34	9·13	8·15	4·73

Discussion

This has been primarily a factual report on work completed in a fracture unit over a specific period and related only to one type of disease. Its aim has been to present the basic data from a retrospective analysis of the case notes of the patients with fractures of the neck of the femur. The management of these cases in this unit has been presented in broad terms. Some of the findings are discussed.

The well known preponderance of females over males suffering from this disease is well demonstrated in this series (Fig. 2). The exact reason for this has never been discovered but there is probably some simple explanation for this marked difference in the sexes. The obvious one is the influence of the endocrine changes which occur after the menopause. Osteopososis is more common in the elderly female, and with added minor trauma, fractures of previously weakened structures occur. There is little difference in the incidence in males between 65 and 90 years and this lends support to the suggestion that the anabolic influence of testosterone, which almost certainly is produced throughout male life, may be a factor in protecting the male from this complication of old age.

The large number of female patients suffering from this disease has, in a recent ward change, resulted in the provision of more female fracture beds.

The diagnosis and surgical management of the diseases are relatively straightforward but this study has highlighted a trend in the treatment of the intracapsular fractures (Table II). The proportion of patients over 70 treated by femoral head replacement is greater than those treated by Smith Petersen fixation. This is shown graphically in Fig. 4. It has been the policy of this fracture unit to use the femoral head replacement technique much more frequently in the treatment of patients over 70 with intracapsular fractures. Over the years, this trend has gradually increased. The hospital mortality of patients treated by the femoral head replacement procedure was 14·85 per cent. But, of these 15 patients, the average age was just under 80 years, which is well over the expected average for the population as a whole.

The hospital mortality of the whole series of 14·5 per cent is compared with the figures in the excellent review of the problem by Niemann and Mankin (1968). They found that when the patients were drawn from an institutionalised population, and the treatment policy entirely surgical, the early mortality was high (36·5 per cent). Selection of patients for specific treatment groups has occurred in this Belfast series. The results are seen in the individual hospital mortality rates ranging from 30·16 per

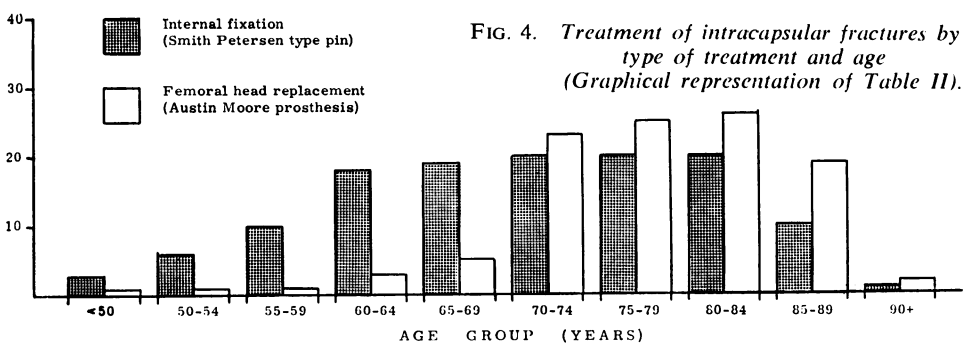

FIG. 4. *Treatment of intracapsular fractures by type of treatment and age (Graphical representation of Table II).*

cent for the conservatively treated patients to 3·94 per cent for those treated by Smith Petersen nailing.

There is a striking difference in the infection and early mortality rates of those treated by femoral head replacement with Austin Moore prostheses. Niemann and Mankin report disappointing results in their series of unselected institutionalised patients all of whom were treated surgically. They record a high infection rate of 41·38 per cent (12 out of 29 patients) and a mortality rate of 51·72 per cent (15 out of 29 patients) dying in the first six weeks. Where preoperative clinical assessment and selection has taken place, as in this Belfast series, an infection rate of 6 per cent has occurred and a hospital mortality rate of 10·0 per cent in the first six weeks. It would seem that by preoperative clinical assessment and selection the complication rate of femoral head replacement can be reduced.

The nursing problem associated with this disease is immense. The nursing staff carry the greatest burden in the clinical management and the periods of time spent immobilised and in hospital can be taken as an index of the load. Generally speaking, the rehabilitation of all these patients has taken place in this fracture unit and the patients only leave the unit when they are able to walk. Exceptions to this rule are those patients who were transferred back to their local hospital after initial treatment. The periods of hospital care therefore tend to be longer than in many other units but, as a result of this policy, it is possible to estimate an approximate cost of the treatment. At 1967 rates of hospital accounting, it is estimated that a patient with a fractured femoral neck will cost the Health Service about £300.

Some of the periods of hospitalisation seem to be long (Table VIII) but examination of similar reports as collected in the article by Niemann and Mankin suggests that the length of stay in hospital in this series is about average. Patients in ten other series of fractures about the hip show a duration of stay in hospital which varies from one week to twenty weeks, giving an average of 11·4 weeks.

In the final analysis the value of a retrospective review is limited but it does illustrate the pattern of clinical management in this unit, and if supported by long-term follow-up, can act as a guide for future management. From this review it would appear that femoral head replacement of intracapsular fractures in patients over 70 is established.

Summary and Conclusions

A retrospective analysis of 495 patients treated for femoral head fractures is presented.

1. The limitation of a retrospective analysis is emphasised.
2. The well known female preponderance is confirmed.
3. The changing pattern of treatment of intracapsular fractures is demonstrated. Treatment by femoral head replacement, especially in the over-70 age group, leads to rapid mobilisation and early discharge from hospital.

Acknowledgments

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"PROFESSIONAL COMPETENCE OR OBSOLESCENCE — WHICH?"

THE SIR THOMAS AND LADY DIXON LECTURE
Royal Victoria Hospital, Belfast, Northern Ireland
May 7th, 1969

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"In all things let me be content,
In all but the great Science of my calling
Let the thought never arise
That I have attained to enough knowledge.
But vouchsafe to me ever
The strength, the leisure and the eagerness
To add to what I know.
For Art is great,
And the mind of man ever growing."
—from The Physician's Daily Prayer
(Maimonides 1135–1204 A.D.)

A Good Doctor Never Graduates!

MAY I present Dr. Obsolescing Smith and Dr. Competent Smith ? Both are qualified and registered to practise the healing art on the basis of existing legal requirements. Fifteen years ago both completed the first phase of their medical education and received their respective medical degrees. Dr. O. Smith graduated finally and irrevocably. With joyous abandon he severed, for good and all, the shackles of further learning and study. Now, fifteen years later, his few medical books of graduation vintage remain unopened, gathering dust on display in his consulting room for his patients to observe and be duly impressed by their appearance of seeming weighty erudition. He subscribes to no medical journals. He attends no scientific medical meetings. He never enters a hospital to care for a patient; and to enrol in a postgraduate refresher course would never enter his head. The advances of modern medicine have long since passed him by and left him a beached, derelict hulk of professional obsolescence.

By contrast, Dr. C. Smith, the up-to-date, scholarly, compassionate, interested, available, unhurried, painstaking, competent doctor, has never really graduated. It is true that he enjoyed a memorable, pleasant, academic ceremony in the presence of the hierarchy of the university medical school establishment resplendent in their colourful robes, but for him that moment in time was just the beginning of the next phase of his medical education – the forty-year long continuum of

scholarly, postgraduate endeavour in fulfillment of the deep sense of trust for his patients and their families which his exemplary medical school and its teachers had imprinted upon the conscience of his developing mind while under their care during his critical attitude-forming undergraduate days at the university.

To which Dr. Smith should a patient and family, burdened with illness, turn for care in their distress? Dr. Obsolescing Smith or Dr. Competent Smith?

Lifelong Scholarly Endeavour

The good doctor, the competent physician, is moved throughout life by a strong sense of scholarly trust and compassion to pursue, ceaselessly, the quest for new knowledge and new skills to the end that his trusting patients may be well cared for. This concept of lifelong learning is not new. Good physicians throughout the ages have been avid lifelong learners. Witness the plea of the great physician-rabbi-philosopher, Moses Maimonides, 800 years ago in his prayer for "the strength, the leisure and the eagerness" to add to his fund of knowledge. Lord Lister[1] affirmed for his generation that "If you are not willing to learn and unlearn all your life through, you should give up medicine and take up a third-rate trade." William Henry Welch[2], Osler's colleague and contemporary at Johns Hopkins University, restated the concept that "Medical eduction is not completed at the medical school: it is only begun."

Although this view is not new it has been given new impetus during recent years by growing dynamic forces of great complexity in our society. These forces are legion in number. For the hard-pressed, over-worked doctor they compound the problem of keeping abreast of the times. The provision of high quality health care today involves an increasingly intricate delivery-of-service mechanism; a Niagara of new medical knowledge pours forth; the expanding horizons of the biological, social and engineering sciences have an immediate relevance to the suffering of mankind; specialization at all levels of health care is the order of the day; new understanding of the teaching-learning process adds to the efficiency of study techniques and the adoption of innovation; and still that yawning canyon gapes, widely and deeply, between the new knowledge, skill and technology within our reach and its beneficent application for man's ills. In 1962 the President of the United States of America, the late John F. Kennedy, in addressing Congress[3] considered the matter of such national importance to government and the people that he placed on record his personal view that,

> "The accumulation of knowledge is of little avail if it is not brought within reach of those who can use it. Faster and more complete communication from scientist to scientist is needed, so that their research efforts reinforce and complement each other; from researcher to practising physician so that new knowledge can save lives as swiftly as possible; and from the health professions to the public so that people may act to protect their own health."

To the foregoing forces is added yet another – the growing public, professional and governmental concern about the competence of doctors. In 1967 the National Advisory Commission on Health Manpower suggested, in its report to President L. B. Johnson, that periodic re-examination and re-licensing may be the only way to insure "that a practitioner's knowledge reflects the most advanced results of medical progress." Commission member Dwight L. Wilbur, an internist and the

president-elect of the American Medical Association, stated that, "Naturally, there will be resistance to licensing from doctors." However, Dr. Wilbur, for one, sees logic in the recommendation, pointing out that "What one learns in medical school is often not applicable ten years later."[4]

Professional competence or obsolescence – which? This is the question of the day. The answer is of first moment to the future doctors now in the making and their teachers in medical schools, to physicians now in practice and to the public who must be assured of the finest and highest quality health care that our advanced scientific society is now capable of producing for them.

A Taxonomy of Scholarly Endeavour

There is a viewpoint prevalent among medical teachers and physicians to the effect that short postgraduate courses are the encompassing beginning and the end of continuing education, and that the number of courses presented by a medical school and the number attended each year by the practising doctor is a full measure of achievement in keeping up to date. It is doubtful if salvation cometh from the postgraduate course equivalent of the dutiful, somnolent passivity of resting in a pew on Christmas and Easter Sunday each year.

Continuing postgraduate medical education is a scholarly way of life, the sole purpose of which is the ultimate provision of constantly improving, high-quality patient care thereby assuring abundant national health and vigour.

If continuing medical education is not a short course but a scholarly way of life, then the question may well be asked – What is its nature and scope? What guidelines can be delineated to assist the practising physician to plan his own programme of life-long learning? In order of decreasing rank, though all are of essential importance, five basic forms of continuing medical education are suggested. This guideline, "Taxonomy of Scholarly Endeavour", modified from the Vollan Report[5], provides a scale by which a doctor, teacher, medical school, hospital, medical community, or nation may measure achievement in continuing medical education.

Continuing postgraduate medical education is :

1. The scholarly habit of planned daily reading and study in a home library-sanctuary as an integral part of a doctor's work-day; *and* it is
2. The periodic return every three to five years for three months or more of intensive study in the teaching hospital to reinforce scholarly motivation and attitudes and to acquire new skills and knowledge; *and* it is
3. The day-to-day informal and formal colleague-association in patient care in the community and teaching hospital, in group practice and by consultation; *and* it is
4. The attendance at scientific sessions of learned professional societies, always associating such participation with relevant *pre-session and post-session reading and study in the home library-sanctuary; and* it is
5. The attendance at short courses which incorporate in their design a *pre-course and post-course guided reading programme to be undertaken in the home library-sanctuary.*

The five components of the foregoing taxonomic list constitute an indivisible unit of continuing education endeavour in which the amalgam that binds the components

together is *self-learning* – the studious, planned hours spent by the physician in his home library-sanctuary.

Because the ultimate goal of continuing education is the provision of high-quality care, each doctor will relate his own personal programme of continuing education to the specific needs and specific problems of his patients. Consequently, the application of the "taxonomy" will produce for each physician a highly individualized programme. He alone can set his own curriculum. He alone can select or reject what is relevant or irrelevant to the best care of his patients. He alone can be moved with a sense of compassionate trust to seek out for the benefit and comfort of his trusting patients the advances in the basic medical, clinical, behavioural, biological and engineering sciences which will best promote their health, prevent their illness, cure their disease and alleviate their suffering.

The Home Library-sanctuary

Like the constantly progressing depreciation of the purchasing value of money, professional obsolescence is an unremitting, relentless, erosive process which demands astute, planned, continuing, corrective action. For the doctor this means : adequate time, the quietude of a home library-sanctuary, and a collection of carefully selected, reliable book and periodical resources on the library shelves, so that he may studiously accomplish three distinct acts of personal continuing education :

1. *Identify* new information relevant to the care of his patients.
2. *Reinforce,* by periodic review, previously acquired essential knowledge before it slips silently from the grasp of his conscious recall.
3. *Discard* that which is no longer relevant to the good care of his patients.

Stelson[6], of the Carnegie Institute of Technology, in reference to obsolete engineers concludes :

> "New knowledge in the field is developing so rapidly that a practising engineer must spend about 10 per cent of his time extending his knowledge just to maintain his relative position in the profession. But this figure assumes that he retains all his previous training, an achievement rarely encountered. Therefore, a more realistic estimate is that he must spend 20 per cent of his time acquiring new knowledge if he wishes to maintain his value to his employer and to society. If he wants to forge ahead, he will probably have to devote about one-third of his time and energy to self-education and improvement."

If this is true for engineers, how much more so for doctors entrusted with the life of patients. It is suggested that *for a good doctor, not less than one hour a day or half-a-day a week is a bare minimum of time for the reading and study necessary to ward off professional obsolescence.*

Schisgall[7], in "What You Can Do With An Hour a Day", telling of what some distinguished world figures have accomplished, states :

> "If you devote but one hour a day to an engrossing project you will give it 365 hours a year, or the equivalent of more than 45 full working days of eight hours each. This is like adding one and a half months of productive living to every year of life! Yet, when I talk about an hour a day of privacy for self-development, the reply is apt to be : 'I'm too busy. I work all day. When I come home I'm exhausted. I want some time with the children.'

Admittedly, it is not easy. It requires resolution. The trick is to create the hour, then use it wisely."

The Teaching-hospital Sabbatical Pilgrimage

The value of a periodic return to the teaching-hospital environment cannot be over-emphasized. This learning experience should be a *sabbatical must* every three to five years. Freed from the pressures of practice for three months or more, it "recharges the batteries" of scholarly motivation; it reinforces good practice attitudes and habits; it provides an opportunity to acquire new skills – diagnostic, therapeutic, operative; it re-exposes to the stimulus of academic-level ward rounds, conferences and seminars; it opens the doors to rich library resources; and it involves the physician in formal and informal personal confrontation with the enquiring minds of teachers, research scientists, fellows, residents and interns.

This essential form of postgraduate education must of necessity be highly individualized. For each doctor, the three-month or longer experience will be specially designed to meet the special needs of his patients and to suit his own personal interests in practice. Nepotism, provincialism or even nationalism should not be determining factors in the decision of where a doctor will seek this continuing education. He should select what, for him and for his patients, is the very best teaching hospital or series of hospitals, wherever situated on the face of the earth.

Peer Association in Learning

There is a tendency to overlook the very substantial amount of continuing education that goes on unobtrusively from day to day, year in, year out, through the informal and formal association of doctors in the course of caring for their patients. It takes place by the bedside, in the hospital corridor, over cups of coffee, in the group-practice office suite, by local and long-distance phone, and it not infrequently spills over at the "19th hole" or intrudes at an after-five party. "Wherever two or more are gathered . . . " to paraphrase Holy Writ, doctors will probably be talking, among other things, about patient-care problems.

More formally, in the community hospital, destined, I most sincerely hope, to assume a major and increasingly important role in postgraduate medical education, activities such as ward rounds, medical staff meetings, clinico-pathological and radiological conferences, tissue committee studies, medical audits of patient care, serial patient-management reviews, journal clubs, etc., are invaluable learning experiences which constantly up-grade the quality of care not only in the hospital but also in the office practices of the medical staff and thereby in the entire community served by the hospital.

This is a crucial and overwhelming argument for making absolutely certain that family physcians are a part of and play a significant role in every hospital.

The consultation, whether by personal confrontation, by letter or by telephone, continuously and imperceptibly diffuses innovation and leavens the quality of patient care. Reliable information on the latest and proved new drug, its use, its dosage and its dangers, is but seconds away from every doctor. It is as close as the phone that associates the enquiring doctor with his answering professional peer resource, be he 100 yards or 100 miles distant. The telephone, bringing two physicians together in therapeutic enquiry, is one of the most valuable single

devices in the field of new drug continuing education. "When in doubt phone a professional peer resource for reliable information on new drugs!" – this should be a guiding therapeutic principle for every doctor if he wishes his trusting patients to have the unbiased best and safest drug at the lowest cost.

The growth of group practice facilitates the diffusion of new knowledge and the acquisition of new skills among group-practice colleagues through personal association in the office suite and by sharing patient-care responsibilities in the community hospital. A further continuing education benefit of group practice is the opportunity it provides periodically for each member of the group to attend the scientific sessions of learned professional societies and short courses. Further, group practice makes it easy for the sabbatical return of its members, periodically, to the teaching hospital.

The Learned Medical Society in Scientific Session

Few professions can equal the degree of vigour and amount of scholarly endeavour which takes place annually in the scientific sessions of its numerous learned medical societies – local, regional, national and international – which convene to deliberate on advances in the basic medical, clinical and related sciences. Its favourable impact on the quality of patient care must be immeasurably great and beneficient. The "taxonomy" presented underlines that the value of each session would be substantially enhanced by pre-session distribution (six weeks ahead at least) of all papers, or an outline of each, with related key references. This would permit each physician using his home library-sanctuary to review the subjects and would prepare him to participate with searching intelligence during the discussion periods of the scientific meeting. Implicit in this concept is the view that scientific sessions generally might be more productive and stimulate more pre-session and post-session reading and study if the sessions were designed to allow more small-group exchange of views.

Short-course Galvanic Stimulation

"Many who are first shall be last and . . ." Thus it is with the short or refresher course in the taxonomic hierarchy of continuing education endeavour. This is not to deny the great value of the increasingly popular short course. More and more first-class courses are being made available to the practising physician. This is most praiseworthy. Often, however, a short course appears to be an exercise devoid of cerebration in which, hour after hour, row upon row of satiated, somnolent physicians are soothed and sedated by the susurrous sound of lengthy pontification intoned from a podium.

As with the scientific sessions of the learned medical societies, the value of short courses lies in associating each subject presented with a short but highly relevant list of *practical* references for pre-course and post-course reading. Short course subjects should always be meaningful in terms of the common needs of the patients of the doctors for whom the learning experience is being designed. In planning a course, two basic questions should be posed : What common disorders of the family group in the community concerned are being badly or poorly managed? What practical innovations, the product of scientific advance, should be introduced to improve the health care of the family group in the community? Half the course,

and preferably much more, should be participative, thus enabling the practising doctors in small groups to set the agenda by the questions they direct to the teachers.

Above all, each teacher should be aware that participation in a short course is a very special teaching task. The teacher is not dealing with a captive undergraduate audience regimented in rows on schedule. He faces a group of physicians meaningfully and deeply involved every day in the drama of patient life and death – physicians who freely occupy the rows and pay a fee to do so! This requires of the teacher many hours of study in his own home library-sanctuary, poring over Miller's "Teaching and Learning in the Medical School"[8] and Verner's "Adult Education"[9]. These basic references on the teaching-learning process are very relevant to his important contribution to a short course.

The short course should be recognized for what it is – simply and only, a brief, episodic, galvanic learning stimulation which is an utter waste of time for the doctor and teacher alike unless it motivates the doctor to continuous, enquiring, prying pursuit of new knowledge and new skills for the sole purpose of bringing the benefits of scientific innovation to his trusting patients.

A Scholarly Way of Life

Through the centuries the scholarliness of countless physicians, generation upon generation, has conferred upon the medical profession as a whole the recognition of a privileged position among the three time-honoured learned professions. Today this quality of scholarliness has become of public moment and expediency. What a physician does or does not do is increasingly in the white light of peer and public scrutiny. His patterns of practice and the quality of his patient care are now being observed, measured and assessed by the cybernetic monsters in the medicare offices of government. This process of evaluation is likely to increase. As it reveals and defines instances of failure to bring the benefits of modern advances to patients, it will undoubtedly prod, encourage and perhaps stimulate certain physicians who have failed their trusting patients to begin a planned programme of keeping up to date.

The mounting public interest in physician competence is such that world leaders, including Ashby in the United Kingdom[10], quoted editorially on "Selection and Obsolescence", and Gundersen[11], in 1959 as the then President of the American Medical Association speaking on "Medical Responsibilities in a Changing World", have raised the issue of conditional licensure to practise with renewal based on evidence of continuing scholarly pursuit. The threatening goad of conditional licensure may frighten and coerce some obsolescent physicians into studious ways, but let it be said and underlined that compassion and a sense of trust for patients have been, are, and always will be the only enduring and effective forces that move a good physician to be a life-long learner on behalf of his trusting patients. Of "the goodness of the physician", Hippocrates wrote long ago that: "Where there is love of man, there is also love of the art." This is the beginning and end of all postgraduate medical education.

A Good Doctor is not a Soloist !

Today a good doctor is just one member of a health care team – a team that is steadily growing in numbers, in specialization of functions and in sophistication of skills. Today a doctor can no longer practise unto himself and provide his patients with high quality care. He cannot fulfill the trust of his high calling unless he assures his patients of the special skills and dedicated devotion of the large group of health care colleagues who constitute the essential membership of the modern health care team.

Within living memory the doctor's sole associate in the delivery of health care was his horse. Then came the doctor's first team colleague – the nurse. As the product of science and technology began to pour forth in full flood the ratio of one doctor to one nurse steadily changed until in many communities the ratio is now one doctor to at least 15 other health care professionals.

During the past ten years the concept of the health sciences team as the new primary functional unit in the provision of health care has captured the attention of medical schools, teaching hospitals, health departments, the health science professions and the public generally. Witness the great new health sciences centres arising across the face of the earth dedicated to the view that high quality health care can only be provided by the cooperative, coordinated endeavour of many well-trained, highly qualified, experienced men and women using the proven new advances of all the sciences.

In 1968 a Division of Continuing Education in the Health Sciences was established at The University of British Columbia. Representatives of eleven health sciences on campus began to organize and function together in common accommodation, with common programming activities, as a continuing education leader group. This group included a representative from dentistry, hospital administration, library science, medicine, nursing, nutrition-dietetics, occupational therapy, pharmacy, physiotherapy, psychology, social work and a member responsible for developing the concept of interprofessional undergraduate education in the UBC health Sciences Centre.

This group, being unable to identify a published definition of a "health sciences team", set as its first team-task the construction of one which would embody Dean J. F. McCreary's basic concept for The University of British Columbia's Health Sciences Centre [12] [13]. This proved to be an invaluable melding mechanism for the health sciences continuing education leader group. After six months of philosophical consideration and dynamic exchange of views, a growing consensus produced a draft definition which portrays to some degree the general dimensions of the group's concept of a health sciences team :

> A *Health Sciences Team*[1] is a group of health professionals[2] with their respective associated technologists, technicians and other essential personnel[3], whose overall goals[4] are the promotion of health[5], the prevention of disease, the diagnosis and treatment of illness and the alleviation of suffering, who, by cooperation[6], coordination[7] and integration[8] of effort provide health care embracing the sumtotal of relevant knowledge, skill and technology produced by all the sciences[9] and as applicable by the other learned professions[10], and who recognize every healthy or apparently-well person[11], each patient, the

family and the community as integral participants in the process of providing this care.

To indicate to some extent the scope of the group's philosophical considerations in developing the foregoing draft definition an explanatory glossary with brief notes is presented :

1. *team* – set [group] of persons working together, combined effort, organized co-operation. (Oxford Concise Dictionary).
2. *professional* – (variously defined but for these purposes) a university graduate in an academic field with relevance to the provision of health care in the community, including dentistry, hospital administration, library science, medicine, nursing, nutrition-dietetics, occupational therapy, pharmacy, physiotherapy, psychology, social work and others.
3. *essential personnel* – a wide range of most important individuals including executive personnel, administrative assistants, secretarial, clerical, maintenance staff, and others.
4. *overall goals* – listed in a suggested rank order with "promotion of health" being first and paramount.
5. *health* – "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." (World Health Organization).
6. *cooperation* – to work together to the same end [goal] (OCD).
7. *coordination* – to bring [parts] into proper relation. (OCD).
8. *integration* – to combine [parts] into a whole. (OCD).
9. *all the sciences* – physical, chemical, biological, basic medical, clinical, social, computational, engineering and others.
10. *other learned professions* – architecture, education, law, religion and others.
11. *apparently-well person* – appearing healthy but presymptomatic disease revealed by skilful examination including multiphasic testing.

The foregoing will make apparent the comprehensiveness of the concept of the health sciences team, its membership, goals, supporting resources and functional principles, as envisaged by The University of British Columbia's Division of Continuing Education in the Health Sciences.

There was a day, quite a long time ago, when the doctor was a soloist occupying the centre stage all alone in the drama of life and death. That day is gone, never to return. Today, the good doctor is a lifelong learner and the active coordinator of a comprehensive health care team dedicated to the promotion of health, the prevention of disease, the diagnosis and treatment of illness and the alleviation of suffering.

This presentation began with an excerpt from a prayer by the great physician whom Sir William Osler called "the prince of Hebrew physicians". It seems appropriate that the lecture conclude with some pertinent words about continuing education from Osler himself[14]:

> "There are many problems and difficulties in the education of a medical student, but they are not more difficult than the question of the continuous education of the practising doctor. Over the medical student we have some control, over the other, practising doctor, none. The university and the licensing authorities make it certain that the medical student has a minimum, at least, of professional knowledge, but who can be certain of the state of the knowledge of the doctor in practice in five or ten years from the date of his graduation? The conditions of his existence demand that he shall be abreast of the times. The family doctor should be carefully nurtured by the medical

schools and carefully guarded by the public. Humanly speaking, with him are the issues of life and death, upon him falls the grievous responsibility in those terrible emergencies which bring darkness and despair to so many households. No class of men needs to call to mind more often the wise comment of Plato that education is a life-long business."

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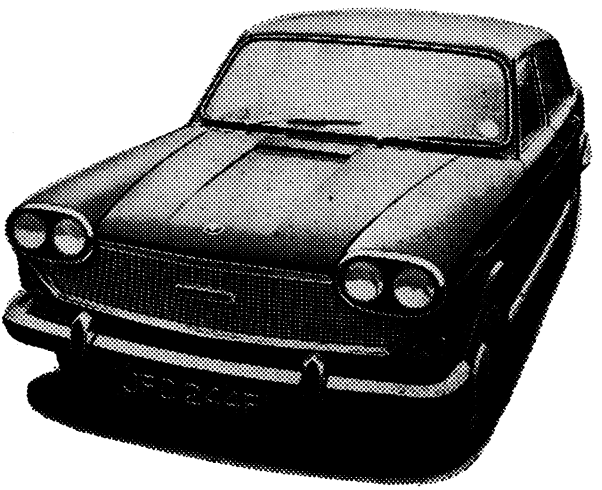

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NON-GONOCOCCAL URETHRITIS ACQUIRED CONCOMITANTLY WITH GONORRHOEA IN MALES

By J. D. H. MAHONY, M.D., M.R.C.P.(Glasg.), D.C.H., D.R.O.C.G.
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THE AIM of this retrospective study was to estimate the incidence of concomitantly acquired non-gonococcal urethritis (N.G.U.) in males penicillin-treated for gonorrhoea.

Material Used

The clinical records of 200 consecutive cases of gonococcal urethritis attending The Special Clinic at the Royal Victoria Hospital, Belfast, from January 1966 to March 1967 were studied. Excluded from the study were seafarers and non-residents who could not be given routine surveillance.

Formulation of diagnostic criteria involves consideration of:

The incubation period of N.G.U.

The clinical and microscopic components in the diagnosis of N.G.U.

Incubation Period of N.G.U.

What is the incubation period of N.G.U.? That there is no straightforward answer to this question is not surprising in view of the fact that there are more than a dozen possible aetiological agents for this condition (King 1964). There are, moreover, two additional highly variable factors, viz: (1) the degree of patient-tolerance to a feeling of discomfort in the penis, or mild dysuria; and (2) the degree of patient-concern generated by a "slight discharge". It seems likely that some patients may either not notice, or else feel unconcerned about slight urethral discharge and never seek medical advice. It is certainly true that some consult a physician only after the discharge has been present for several weeks or even months.

Some indication of the very wide range of variation in the estimates by different workers can be guaged from the fact that Boyd, Csonka and Oates (1959) concluded that the incubation period of N.G.U. could vary from less than 8 days to 13 weeks. Harkness (1950), however, set the limits between 5 and 30 days; but the longer estimates are based on the time interval between exposure and the seeking of medical advice by the patient.

In the present study the patients sought medical advice early on account of gonorrhoea and were kept under close supervision. Under such circumstance the diagnosis of N.G.U. depends on criteria applied by a trained observer (the physician) rather than on the degree of patient-concern or indifference to any signs that develop. One of the authors referred to above, Csonka, carried out a further study in 1967 where a group of patients penicillin-treated for gonorrhoea were observed for the development of N.G.U. Twenty-one days from the first day of attendance was postulated as the incubation period under these circumstances.

In the present study, 28 days from the day of the first attendance at the clinic was arbitrarily chosen as likely to include the majority of concomitantly acquired cases of N.G.U. Signs developing subsequent to this were thought to have more probably been due to re-exposure.

It was further held that penicillin has no therapeutic effect on N.G.U. and hence that the incidence of penicillin-treated patients who developed N.G.U. before the

twenty-eighth day of surveillance could be taken to represent the true incidence of double infection at the time of exposure (Gartman and Leibovitz, 1955).

The Clinical and Microscopic Components in the Diagnosis of N.G.U.

In this series no virology studies were made, and the only non-gonococcal pathogen sought (but seldom found) was *Trichomonas vaginalis*. N.G.U. was diagnosed on the following clinical and microscopic findings:

(1) The presence of a purulent, mucopurulent or mucoid urethral discharge persisting or recurring more than a week following the disappearance of gonococci from urethral smears and cultures.

(2) The presence of urinary "threads" under the same circumstances. (Whenever the significance of a "thread" is in doubt at this clinic, it is gram-stained and examined microscopically and is regarded as evidence of urethritis if it contains polymorphonuclear leucocytes). When prostatic massage yields a secretion containing fields of 10 or more polymorphs per high-power field (X 90 objective) this is taken as evidence of prostatitis plus posterior urethritis.

Results

Applying these criteria is was found that 23 out of 200 (11.5 per cent) patients with gonorrhoea had a concomitantly-acquired N.G.U. It must be added, however, that no less than 64 (32 per cent) of these patients defaulted before the twenty-eighth day of surveillance. As it seems unjustifiable to assume that none of these defaulters developed N.G.U., the above estimate should be taken to represent the minimum incidence of double infection. Ten patients developed symptoms of N.G.U. between 7th–13th day, 8 from 14th–20th day and 5 from 21st–27th day.

Comment

It is of interest that Csonka (1967) estimated that 22 per cent of his patients who were treated with penicillin for gonorrhoea had a concomitantly-acquired N.G.U. He allowed 21 days from the first day of attendance as the likely incubation period for N.G.U. His default rate was 16.5 per cent. It is surprising that his estimate should be approximately twice that of this series.

N.G.U. has shown a yearly increase in England and Wales since 1952. Moreover, the N.G.U./G.C. ratio has shown an overall tendency to rise, though it still remained below unity in 1966. In Belfast the N.G.U./G.C. ratio has exceeded unity since 1966. In 1967 it was 3/2 approximately. This finding would appear to support the contention of Laird (1958) from his Manchester study that gonorrhoea is relatively commoner in immigrant communities (viz: West Africans and Irish) and N.G.U. in indigenous populations; for Northern Ireland has a relatively static population and has no large immigrant community.

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HYPERGLYCAEMIC NONKETOTIC COMA IN DIABETES, OCCASIONED BY A CONCENTRATED CARBOHYDRATE DRINK

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THE CASE is reported because it suggests that hyperglycaemic nonketotic coma may be caused in certain diabetic persons by the ingestion of a large quantity of carbohydrate. The coma or stupor is exogenous, and not endogenous. The disease is an example of true food poisoning.

The patient was a widow of seventy-four who lived alone. Her husband had died a few months earlier. She had been ill at home for some four weeks or more. She was found unconscious in her house. At the time of admission she was stuporose. She had been weak. She had been very thirsty and had drunk a lot. She had eaten less and less. From time to time she had vomited. In spite of drinking, the thirst had increased. Her legs became so weak that she could hardly walk.

On examination, besides the impairment of consciousness, there was dehydration. She felt cold, and the rectal temperature was 96.8°F. There was no tremor, flap or convulsive movement. There was no hyperventilation of a ketotic kind. No ketones were found in the urine, though it was tested many times. The skin was depigmented. There were Heberden's nodes. There was trunk obesity. It was later evident that she was deaf, and that there was impairment of vision. The haemoglobin was 86 per cent. The biochemical findings are set out in Table I. The clinical and biochemical features seem to establish a diagnosis of diabetes mellitus, with extreme hyperglycaemia, dehydration, and stupor or semi-coma, but without ketosis.

It can be seen from Table I that a good result was obtained by treating the patient with insulin, and with intravenous infusion of water, and with electrolyte adjustment. Our patient was stabilised in convalescence on a diabetic diet of 1,500 calories and the Tablet of Tolbutamide, B.P. Evidently in this disorder the cerebral depression is reversible, because the patient returned to her normal state of alertness and ability.

We already knew that occasionally, when a patient, not yet recognised to be diabetic, first comes for examination, the initial blood sugar levels may be higher than the severity of the diabetes mellitus would warrant. We also knew that this has been because the thirsty patient has been taking a concentrated carbohydrate drink (C.C.D.). These flavoured, coloured, carbonated carbohydrate drinks have become very popular since they became available some years ago. They are drunk in Belfast as lemonade and other "minerals" are, and it has passed into the folk-lore of the city that they are sources of nourishment and strength. The composition of the two common concentrated carbohydrate drinks (C.C.D.1. and C.C.D.2.) are set out in Table II and Table III. C.C.D.1. is the more popular, and its satiety value is low. Another of our diabetic patients drank a bottle (25 fluid ounces – 710 ml.) in one and a half hours, and could have drunk more if it had been to hand. For the composition of Liquid Glucose (B.P.C.1963) see Table IV. It will surprise many that Liquid Glucose is not a solution of dextrose. Of its solids four-fifths are complex

DATE	TIME	BLOOD SUGAR mgm%	INSULIN DOSE	Na.	K.	Cl.	CO_2CP	P.S.G.	UREA	pH	pCO_2	BASE EXCESS	BUFFER BASE	STANDARD BICARBONATE	WATER INTAKE	URINE OUTPUT
24th JAN	5.30pm	1040	400 UNITS INSULIN B.P.	140	5.0	104	14.4	1.031	40						180 fluid ounces (5112 ml.)	12 fluid ounces (340 ml.)
	7.45pm	1060		140	3.3	108										
	10.00pm	810		148	3.0	114		1.028	45	7.32	21.5	-13.0	38.2	15.2		
25th JAN	12.45am	460	416 UNITS INSULIN B.P.	150	3.6	116										
	7.30am	70		138		106	16	1.034	148							
	8.45am	60		154	4.0	116	27	1.024	127							
	11.00am	62		155	3.9	114	26	1.023	128	7.37	32.5	-5.2	44	20	131 fluid ounces (3720 ml.)	26 fluid ounces (738 ml.)
	3.00pm	380		140	4.5	111	30	1.022	132							
	11.00pm	550		141	4.9	103	28	1.023	130							
26th JAN	10.30am	280	80 UNITS INSULIN B.P.	142	4.8	107	24	1.022	108	7.5	25	-1.6	48	22.6	151 fluid ounces (4288 ml.)	73 fluid ounces (2073 ml.)
	4.00pm	212		137	4.4	105	25	1.022	93							
	10.45pm	330		139	4.8	106	24	1.021	78							
27th JAN	am	320	136 UNITS INSULIN B.P.	136		107	21	1.022	49	7.39	34	-3.8	45	21.1	123 fluid ounces (3493 ml.)	98 fluid ounces (2783 ml.)
	12 noon	292														
	5.00pm	304		135	4.8	110	22	1.022	37							
28th JAN	12 noon	292	140 UNITS GLOBIN ZINC INSULIN B.P.	139	5.0	107	21	1.023	46							
	5.00pm	138														
	9.30pm	30														
29th JAN	7.00am	30	140 UNITS GLOBIN ZINC INSULIN B.P.													
	10.45pm	25		139	3.8	112	19	1.022	37							

Table 1.

TABLE II

Composition of Concentrated Carbohydrate Drink 1 – Manufacturer's information

Each bottle contains in 25 fluid ounces (710 ml.):

Liquid Glucose (B.P.C.1963)	26.5% w/v
Citric acid	0.2% w/v
Lactic acid	0.1% w/v
Sodium benzoate	0.03% w/v
Flavouring	
Colouring	

Totals in bottle

Liquid Glucose	185.0 grams
Lactic acid	.7 gram
Citric acid	1.4 gram
Sodium benzoate	.21 gram

If the total carbohydrates in a bottle are calculated as monosaccharides, the result is equivalent to 155 grams of glucose.

For the composition of Liquid Glucose (B.P.C.1963) see Table IV.

TABLE III

Composition of C.C.D.2. – Manufacturer's information

Each bottle contains in 25 fluid ounces (710 ml.):

Liquid Glucose B.P.C.	28.0% w/v
Citric acid	.08% w/v
Tartaric acid	.14% w/v
Saccharin	.007% w/v
Sodium benzoate	598 p.p.m.
Total Liquid Glucose in bottle	198 grams
Total carbohydrate in bottle	163 grams

TABLE IV

Composition of Liquid Glucose (B.P.C.1963)

The monograph in the British Pharmaceutical Codex 1963 states that Liquid Glucose is a colourless or almost colourless, very viscous syrup, produced by the hydrolysis of starch, containing dextrose (10–20%), dextrins, maltose and water.

The manufacturers of C.C.D.1. state that in 100 grams of Liquid Glucose solids there are the following:

Dextrose	19.3 grams
Maltose including isomaltose	14.3 grams
Trisaccharides	11.8 grams
Tetrasaccharides	10.0 grams
Pentasaccharides	8.4 grams
Hexasaccharides	6.6 grams
Heptasaccharides	5.6 grams
Octa – and higher saccharides	24.0 grams
Total	100.0 grams

Liquid Glucose is not included in the British Pharmaceutical Codex 1968.

saccharides, and only one-fifth is dextrose. Syrup of Liquid Glucose is a different preparation – 33 per cent w/w of Liquid Glucose in Syrup B.P. (which itself is Sucrose B.P. 66.7 per cent w/w in water).

As soon as our patient could answer questions we asked her what she had been drinking to quench her thirst. She said she had been drinking C.C.D.1., and also in a lesser quantity C.C.D.2. She had drunk a bottle (25 fluid ounces – 710 ml.) every day, or every two days, and the more she drank the thirstier she became. It will be seen from Table II that one bottle of C.C.D.1. would add the equivalent of 155 grams of glucose to her daily intake, and, from Table III, one bottle of C.C.D.2. would add 163 grams of carbohydrate. We do not know how many bottles of C.C.D.1. the patient really drank in the day, but the satiety value is low, and there would be no difficulty in taking several bottles a day. C.C.D.2. is sweeter to taste, and it is not so easy to take several bottles daily.

Our interpretation of the case is that our patient was an elderly mild diabetic, of a type not likely to be, or to become, ketotic. Her pattern of eating was upset by the death of her husband, and the consequent living alone. She became thirsty, and to relieve the thirst drank, among other things, C.C.D.1. and in a lesser quantity C.C.D.2. This substantial increase in carbohydrate intake promoted extreme hyperglycaemia, and a glucose diuresis. In consequence there was dehydration (made worse in the end by vomiting) and a fall in plasma volume. This resulted in poor organ and tissue perfusion, and in general metabolic failure. We take the hypothermia to be a feature of failing metabolism, and we take the initial low blood urea to be evidence of depressed liver function. We suppose the rise of blood urea, when the patient was treated and improved, to mark an improvement in liver function. Conversely the original high level of blood sugar may have been in part due to failure of the liver to take up glucose.

We suggest, therefore, that hyperglycaemic nonketotic coma in diabetes may be due to a diabetic person, of a type who is not likely to become ketotic, and who does not know that he or she is diabetic, becoming thirsty, and then consuming large quantities of C.C.D. If the thirsty phase is caused by infection or gangrene, the outcome may not be so favourable as in our case, where there was no infection and no gangrene.

It is in accord with this view that Lucas (1963) reported that his first case "had an intense craving for glucose-containing beverages for several weeks before admission" and that "as a result, his daily intake of carbohydrate was often several hundred grammes higher than the average".

Polydipsia is a more common and compelling diabetic symptom than polyphagia, so the syndrome is more likely to be produced by carbohydrate drinks than by solid carbohydrate foods. Nevertheless, solid carbohydrate foods can produce the syndrome in nondiabetics (Rosenberg *et al.*, 1965), and in diabetics as recorded by White (1963) and perhaps by Halmos (1966). Halmos' case 3 had "a craving for sweets" before becoming drowsy with a blood sugar of 1210 mg/100 ml. White reported that his patient "consumed exceedingly large quantities of cake, confections, and ice-cream, and became ill shortly before her admission to hospital with gastro-enteritis after consuming raspberry syrup".

It supports our view of the causation that a similar hyperglycaemic nonketotic coma is seen in forced feeding of burned patients (Rosenberg *et al.*, 1965). This

coma occurred in burned patients, who were fed very large quantities of carbohydrate, so as to give them a high calorie intake. Rosenberg mentions calorie intakes of up to 6,000 a day, and carbohydrate intakes of up to 1,000 grams a day. These patients had blood sugars from 800 to 1,600 mg/100 ml. Of six patients three survived. Of these three, in convalescence, only one had a mildly diabetic glucose tolerance test.

It further supports this view that the syndrome in diabetic patients almost always occurs *before* diabetes mellitus is diagnosed, and not often afterwards. Probably patients, once they know that they are diabetic, and once they have been instructed in dieting, do not take C.C.Ds. and so do not have the syndrome.

It seems that the syndrome may occur not only in nondiabetic persons, and in mildly diabetic persons, but also in persons with pancreatitis (Davidson, 1964; Halmos, 1966 – Case 6; Ward, 1963). Perhaps it occurs in pancreatitis because of pancreatic diabetes, and a high carbohydrate load in drinks and infusions.

When, because of diabetic thirst, or for any reason, the protection of the satiety mechanism has been overcome, and an excessive and harmful carbohydrate load has been ingested, no further protection is afforded by restraint in absorbtion. The small intestine can absorb up to one gram of glucose per kilogram body weight per hour (Hoffman, 1964).

The first report of this syndrome is usually taken to be that of Sament and Schwartz (1957) though extreme hyperglycaemia had often been reported before. The first Belfast report was that of Grant (1965). The second Belfast report was that of Halmos *et al.* (1966). C.C.D.1. was first distributed in Belfast in 1950. It first was manufactured in Belfast in 1953. It became popular immediately, because it was an agreeable drink for well people, and a useful form of water and glucose for sick people. Indeed it is a helpful advance in materia medica. However, it seems that its inappropriate use has produced a disorder new to us. It is interesting that at one time the Liquid Glucose content of C.C.D.1. was increased by 28 per cent w/v, but it was found that at that strength "it was not thirst-quenching" – "people had to go back for more".

It is worth remembering that there is a third concentrated carbohydrate drink, used in renal failure, not directly on sale to the public, which contains 106 grams of carbohydrate in each bottle of 175 ml. (6 fluid ounces). Renal units using this drink should know of the risk of inducing hyperglycaemia.

An analogous risk of hyperalimentation may be seen in tube feeding, when, if too much protein is administered, uraemia may be induced (Engel and Jaeger, 1954). In this case too, the normal mechanism of satiety no longer protects the patient against an excessive and harmful intake of a food constituent. In each case, there is true food poisoning.

It is possible that co-existing hyperglycaemic *and* ketotic comas may be seen. The case of Argy (1925) may illustrate this. It is no doubt important not to induce an element of hyperglycaemic coma, when treating diabetic ketotic coma, by infusing intravenously unnecessary quantities of dextrose solution.

Treatment should begin with stopping the abnormal carbohydrate intake, if it has not already ceased. It ought to continue with the Injection of (Soluble) Insulin B.P. and the intravenous infusion of water. An important question is, in what form should the water be infused? It is plainly not at first appropriate to use dextrose solutions.

In the early stage of treatment, when the plasma is hyperosmolar, all solutes seem contraindicated. There seems to be no contraindication to the infusion of Water for Injection B.P. in 500–ml. units. Some failures and difficulties in treatment in these cases may have been due to a reluctance to infuse Water for Injection B.P. There seems no danger in the first stage of treatment of producing hypo-osmolarity of the plasma, nor of producing red cell haemolysis. After the first hour it will likely be necessary to use a potassium solution, and Sterile Potassium Chloride Solution B.P. 10 ml. (or more, or less, as the need may be), may be added to 500 ml. of Water for Injection B.P. and infused. The addition of 10 ml. makes a 0.3 per cent solution of potassium chloride. A 1.19 per cent solution is iso-osmolar. Progress is not difficult to monitor, if one observes pulse volume, blood pressure, urine output and venous pressure, and has frequent estimations of blood sugar and of electrolytes and urea. When these estimations indicate it, solutions of sodium chloride or of dextrose or of sodium bicarbonate may be infused, iso-osmolar or hypo-osmolar as the need is.

The acidosis may need no special treatment and it may be better not to include sodium bicarbonate solution in the intravenous programme at least in the beginning. Increase in osmolarity is to be avoided.

If there has been a period of some weeks of malnutrition, it seems proper to administer Injection of Thiamine Hydrochloride, B.P. 25 milligrams, Injection of Nicotinamide, B.P. 100 milligrams, and Injection of Hydroxocobalamin, B.P. 1,000 micrograms, so that deficiency of these will not persist, and delay improvement, especially in the central nervous system.

Summary

The introduction of palatable, concentrated, carbohydrate drinks, particularly of those of low satiety value, has increased the number of cases of hyperglycaemic, nonketotic coma in diabetic persons. As proposed by White (1963), the severity of the hyperglycaemia and of the coma depends mainly on the size of the ingested carbohydrate load, and not on any peculiar severity of the diabetic process. The ingested load is high because the ordinary mechanism of satiety is not operating to keep the load in normal limits. This may be because the carbohydrate preparation has a low satiety value (e.g. C.C.D.1.), or because the normal mechanism has been overcome by diabetic polydipsia or polyphagia, or because some neurological lesion has depressed the satiety centre, or because of forced therapeutic over-feeding as in burned patients.

Both concentrated carbohydrate drinks and dextrose infusions should be used with caution in pancreatitis. Dextrose infusions should be used with caution in treating diabetic ketotic coma.

Treatment of hyperglycaemic nonketotic coma may include Water for Injection B.P. in the early stage. Unless there is some special indication, sodium chloride solution, dextrose solution, and sodium lactate and bicarbonate solutions should not be used while hyperosmolarity is still present.

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SYSTEMIC LUPUS ERYTHEMATOSUS

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Scott-Heron Lecture : Royal Victoria Hospital, 9th May, 1969

THE famous names of the lecturers who have given the Scott-Heron Lecture before me, the weight of their subjects and the breadth of the areas of the world from which they were drawn, ensure two things in any subsequent lecturer – a sense of awe and a sense of apprehension. Both these sensations are mine, but I have had the temerity to accept your wonderful invitation because they are subject to others – to the honour you have done me, and my pleasure at it.

I have been told I can talk of a special interest in the clinical field, and I have chosen systemic lupus erythematosus (S.L.E.). This condition is to me a fascinating one. It used to be said that all medicine could be learnt from the study of syphilis, and most acute medicine from patients with typhoid, and this is now very nearly true for systemic lupus erythematosus. I do not pretend, of course, that systemic lupus erythematosus is a common condition, but it is not a rare one, and as our knowledge of its clinical manifestations has increased in the last 25 and even 10 years, so it is more frequently recognised. My personal records, and those of others, lead me to believe that rheumatoid arthritis is about eight times commoner than systemic lupus erythematosus, and that systemic lupus erythematosus is three times commoner than scleroderma, polyarteritis nodosa or cranial arteritis, and six times commoner than dermatomyositis. Although I have claimed that it has been recently much better understood, I must admit that much of clinical interest was recognised by our medical forebears before the turn of the last century and subsequently largely forgotten.

Discussion of the nature of systemic lupus erythematosus has for some time centred largely around the possibility of a disorder of immunity, and in particular of auto-immunity, but the aetiology is still unknown. There are, however, other factors upon which speculations can be based. The frequency with which this condition affects women during the child-bearing period naturally suggests that the sex hormones play an important part, but although the high mortality rate corresponds suggestively to the levels of urinary oestrogen excretion, endocrine factors cannot be the whole story as both men and women of all ages can be affected .

There is increasing evidence that genetic factors are of importance, both from case histories showing a familial incidence, and from experimental observations, for example, in the mice NZB (Burnet, 1965) and there are seven reports of S.L.E. in identical twins, in one of which it was accompanied by multiple sclerosis in both twins (Holmes *et al.*, 1967). The report by Leonhardt (1967) is notable as he records a family of 14 siblings, 3 of whom had S.L.E. associated with hypergammaglobulinaemia, a fourth had hypergammaglobulinaemia and 4 more had raised serum globulin levels without any clinical manifestations.

The precipitating effect of certain drugs has some relevance here. Support for the well established belief that hydralazine acts as a precipitant comes from a study of fifty patients with the syndrome (Alarcon-Segovia *et al.*, 1964) in which it was shown that in 74 per cent. there were one or more findings to suggest that S.L.E. had pre-

ceded the giving of hydralazine, whereas similar evidence was present in only 20 per cent. of the one hundred hypertensives who were given hydralazine without developing the hydralazine syndrome. Family histories suggestive of S.L.E. were also found in 34 per cent. of those with the syndrome, and in only 8 per cent. of those who did not develop it. This evidence, and that from case histories like the one described by Leonhardt, suggests that there may well be a pre-clinical genetically determined state or diathesis for S.L.E. which can be precipitated into the active disease by various factors such as drugs, and possibly infections. This conception is not without its practical significance, indicating as it does the importance of examining relatives of those with S.L.E. for auto-antibodies, or at any rate for alteration in their plasma proteins. If any such abnormality is found, then extra caution should be exercised when administering drugs to them, particularly if they are women of child-bearing age. It is appreciated, as Bywaters (1967) pointed out, that only a few out of the thousands of drugs used and in a very small proportion of people who use them, is there any development of anit-nuclear factor (A.N.F.), and once the drug is discontinued, both clinical manifestations and the A.N.F. disappear. The presence of anti-nuclear antibodies does not necessarily provoke an allergic disease, and normal antibody response to tissue damage and drugs is evanescent. Still, such widely used drugs as antibiotics, sulphonamides, aneleptics, anti-tuberculous preparations, thiouracils, phenylbutazone and procainamide have been implicated in producing or precipitating lupus-like symptoms, and the abnormality in patients with S.L.E. may be that in them the production of auto-antibodies is not evanescent but persistent (Lachmann, 1967)

Antinuclear Antibodies

Whatever the role of auto-immunity may be in this condition, the serum of patients with S.L.E. contains non-organ-specific auto-antibodies, and their demonstration has proved of diagnostic value. These auto-antibodies can be considered in two groups:

(i) Those which react with nuclear material, including deoxyribonucleic acid (D.N.A.).

(ii) Those which react with cytoplasmic factors such as mitochondria and microsomes, or with other tissues such as white cells and platelets.

It is generally agreed that the tests which are based on the presence in the serum of antinuclear material are at present the most useful in practice. The best known of these is of course the demonstration of the lupus erythematosus cell (L.E. cell) by Hargraves. These cells are found in about 80 per cent. of patients when the usual method is used, but with an improved one they have been found in 93 per cent. of patients with S.L.E. (Arterberry *et al.*, 1964). They are also found in patients with so-called lupoid hepatitis, chronic parenchymatous hepatitis (cirrhosis) and in rheumatoid arthritis. Tests for antinuclear factor (A.N.F.) in the serum are sometimes used for screening, but can be positive when L.E. cells cannot be found and negative in their presence.

Mode of Onset

The mode of onset of S.L.E. varies enormously, and it can mimic a large variety of conditions.

An acute onset – An acute onset, with fever, wasting and often with skin lesions,

occurs in about 20 per cent. of patients, and of these over half will be dead within three years. The diagnosis will quickly be established if L.E. cells are found early on in the illness, but this is far from being invariably the case, and patients are seen in whom they are only found once, and then in small numbers, or even in whom they are never found although widespread histological changes are present at autopsy.

Fever occurs in almost 100 per cent. of patients with an acute onset, and in 85 per cent. of all cases. Skin lesions are seen in about 70 per cent. of patients who are acutely ill, and in half of all patients at the onset. Arthralgia may be a presenting feature in these patients (20 per cent.), but is more commonly seen when the onset is insidious (75 per cent.). Acute renal lesions may occur at the onset, and when they do they usually carry with them a bad prognosis. Blood disorders, such as thrombocytopenic purpura or an acute acquired haemolytic anaemia, are sometimes early features of an acute onset.

A computer analysis of 520 patients by Dubois (1964) has shown that certain combinations of clinical features are commonly observed. Arthralgia, fever, nephropathy and anaemia were present in 30 per cent. of this large series, and arthralgia, fever, adenopathy and pleurisy in 29.6 per cent. S.L.E. may, however, present in a score of ways, and an interesting manner is when recurrent incidents of, for example, pleurisy, pericarditis, mental symptoms and fits, precede the establishment of true diagnosis.

Fever – Fever at the onset may be insignificant relative to the other symptoms and the degree of illness of the patient. It may, on the other hand, be the sole feature, when it may be high swinging, or sustained, the patient presenting as a problem in diagnosis. Recurrent febrile periods accompany activity of the disease process, and often mirror its degree, but at times patients are seen who are surprisingly free from other symptoms, or even feel reasonably well with a persistent fever of about 101°.

Skin Lesions in Systemic Lupus Erythematosus

The skin lesions of lupus erythematosus, including the chronic discoid type, are common when compared with the rarer disorder of systemic lupus erythematosus. They are chiefly confined to the head, including the face, scalp, lips and mucous membranes. They are precipitated by exposure to sunlight and by cold. They may leave unsightly scars from atrophy of the skin and telangiectasia, but not infrequently there is little or no residual disfigurement.

When systemic lupus erythematosus is present the skin may be unaffected or only minimally so, with patchy erythema on the extremities, notably the backs of the fingers and toes, but also on the trunk. The rash may, however, be very extensive, involving in particular a butterfly area over the nose and cheeks, areas much exposed to sunlight. Apart from the erythema, from which the disorder takes part of its name, purpura can occur with or without thrombocytopenia. Swellings of the extremities, with colour and temperature changes and sometimes leg ulcers, which can in some instances be due to cryoglobulinaemia (Larson, 1961) are not infrequent features.

Arthritis and Arthralgia

I have already stressed the high incidence of joint pains during the course of the disease. The pains may be severe in some patients even when there are few accom-

panying signs, such as swelling and local tenderness. The knees are most frequently the source of pain, but other joints can also be affected.

Joint changes may resemble in appearance those of rheumatoid arthritis, and sometimes there is an overlap between systemic lupus erythematosus and rheumatoid arthritis. The joints may, however, have somewhat negative features; they are not always symmetrically involved and the degree of destruction seen radiologically can be less than might have been expected from the severity of the symptoms. The muscles round them waste, not only from disuse but also from a polymyositis, which is a feature of the condition.

Subcutaneous Nodules

These may occur on the extensor surfaces, closely resembling those of rheumatoid arthritis clinically and histologically, with central necrosis and palisade of cells, or rarely the nodules may be due to relapsing nodular non-suppurative panniculitis without subsequent atrophy.

The Cardiovascular System

Peripheral vessels – Peripheral vascular lesions are commonly seen in patients with discoid and with systemic lupus erythematosus, and Raynaud's phenomenon can pre-date other symptoms by many years. Hutchinson's pernio, also known as lupus pernio or chilblain lupus, is a classical manifestation. The patients may have had chilblains for many years, usually with Raynaud-like colour changes, and their fingers may be scarred by healed recurrent ulceration. Again, cryoproteins and cryoprecipitation may be demonstrated.

Venous thromboses can occur at the onset as well as during the course of the disease. They can be recurring or migratory, and thus systemic lupus erythematosus should be considered as a possible cause of unexplained thrombosis and of thrombophlebitis migrans. The great vessels from the heart are occasionally involved in an arteritis in systemic lupus erythematosus, thus mimicking Takayasu arteriopathy, which in its turn can, at its onset, be mistaken for systemic lupus erythematosus.

The heart – A pericardial rub, to fibrinous pericarditis, is heard in about half of the patients at one time or another. Pericarditis with effusion is rarer, but is nevertheless the commonest cause of an enlarged cardiac outline on the X-ray film in this condition.

The disease process can involve the heart muscle, with consequent rhythm changes, including auricular fibrillation and heart block. E.C.G. changes are therefore common (Brigden *et al.*, 1960). Such a patient, a woman of 47, was recently seen with cardiomegaly, congestive cardiac failure and an unexplained pyrexia, who worried us a lot diagnostically until a large number of L.E. cells was found in her blood. The response to steroids was dramatic, the high temperature fell at once and the cardiac size returned to normal.

The classical evidence of cardiac involvement is of the valves, which was described by Libman and Sacks as sterile verrucose endocarditis. The finding of heart murmurs resulting from valvular lesions is as important in differential diagnosis as in the natural history of the patient's illness, as it raises the possibility of the presence of sub-acute bacterial endocarditis, a condition that can mimic or accompany S.L.E.

Hypertension, with or without renal involvement, can of course lead to cardiac enlargement.

Renal Lesions

Transitory albuminuria, with an increase in the cellular deposit, is as commonly found in S.L.E. as in any febrile condition. The prognosis is, however, adversely affected in most cases to a very considerable degree when proteinuria persists, and a renal lesion becomes established. Of eight such patients I have studied in detail, three were dead within three years from the time of diagnosis, but two survived for eight and nine years. Three were still alive after ten, four and two years, respectively, but the last-mentioned was developing the signs of malignant hypertension, and had a blood urea of 102 mgm. per cent. Thus of the eight, only three are known, or are likely to have survived longer than five years from the time of diagnosis.

Gary and her associates (1967) have followed up eight patients with systemic lupus erythematosus with established renal lesions of more than thirty months duration. Four were initially in the nephrotic stage and two were azotaemic. All had the renal lesions of systemic lupus erythematosus proven by renal biopsy, and evaluated by strict criteria, such as the presence of haematoxylin bodies, and of widening and granularity of the glomerular capillary walls. This group of patients was observed to survive for periods ranging from 33 to 135 months without any evidence of progression of their renal lesions.

The policy with regard to steroid therapy adopted by Gary was to give sufficiently large doses of Prednisone to suppress the condition in the acute stages, and then to keep the dosage at the minimal level necessary to maintain the patient's renal function in an unprogressive state. This is a sensible approach provided one is prepared to err on the side of the high dosage rather than low dosage.

It seems that although the prognosis is much worse in those patients who are azotaemic or nephrotic, it is possible to survive with established renal lesions for a considerable period. A study by Comerford (1967) of the histology of the kidney in systemic lupus erythematosus, both by light and electron microscopy, has shown that there can be definite histological involvement without any clinical evidence of renal disease. He concluded:

(a) "There is considerable evidence that such injurious processes are related to primary abnormalities within the circulation, and that these, at least in part, are secondary to immune phenomena."

(b) "It is probable that an important secondary mechanism of renal injury is related to intravascular coagulation, leading to the deposition of fibrinogen-derived substances within the glomerulus, and the subsequent development of chronic renal damage and disease."

Lungs and Pleura

The pleura, like the pericardium, is frequently involved in systemic lupus erythematosus, and recurring incidents of pleurisy should suggest the possibility that this is the underlying condition. The pleural space may become obliterated, and when an effusion is present L.E. cells may be found in the fluid. The commonest source of involvement of the lungs is, of course, bacterial, with bronchitis or pneumonia, as in any debilitating condition.

The radiological appearances of the lung fields are variable and have no special characteristics; miliary mottling may be seen, or there may be ill-defined infiltrations.

Interstitial pulmonary fibrosis, resembling primary interstitial pulmonary fibrosis, with either an acute or a prolonged clinical course, can occur with systemic lupus erythematosus. Both conditions have non-organ-specific auto-antibodies in the blood, but the titre for A.N.F. is low and L.E. cells are absent in primary interstitial pulmonary fibrosis, suggesting that they are separate conditions.

When the lungs are involved in patients with S.L.E. the lesions may *not* be solely, or even partially due to this process, and the presence of a fungal infection must be sought with the greatest care when steroids are being used. The commonest fungus is *Candida albicans*, which can be respiratory or generalised, or occur at the site of any local infection, or in the gastro-intestinal or renal tracts. In a recent report (Pillay, 1968) the death of four patients was attributed to it, and it was considered to have contributed to the demise of eight others. In addition to candidiasis, aspergillosis, nocardiosis and coccidioidomycosis can complicate systemic lupus erythematosus, as of course can infection with *Cryptococcus neoformans* and the tubercle bacillus. The importance of keeping a watchful eye open for these infections is obvious.

The Liver

There are several very important but unanswered questions concerning the liver and systemic lupus erythematosus. The liver is palpably enlarged in about a quarter of the patients, and it is histologically involved in a higher proportion. Clinical evidence of liver failure is nevertheless uncommon in patients with systemic lupus erythematosus.

L.E. cells are present in a variety of liver disorders without there being any evidence of systemic lupus erythematosus. They are found in some patients with virus hepatitis (hepatic lupus), and in a few with cirrhosis (lupoid hepatitis), where the prognosis is thought by some (MacKay and Wood, 1962) to be worse than in certain other types of chronic liver disease, such as alcoholic cirrhosis. The presence of L.E. cells in these various types of liver disease indicates an auto-immune process, but one which is in all probability secondary to tissue damage rather than of primary significance. Many authorities now consider that so-called lupoid hepatitis is essentially hepatitis with abnormal serological reactions rather than a part of systemic lupus erythematosus.

Neurological Lesions

Some neurological involvement in systemic lupus erythematosus is common, and authorities (Johnson and Richardson, 1968) have recently put the figure as high as 75 per cent. for involvement of the central nervous system, and at 8 per cent. for peripheral nerve involvement. Although lesions in the central nervous system account for a large number of deaths from this condition, just as in the case of renal lesions their presence does not invariably imply a bad prognosis. Their origin is usually from micro-infarcts in the cerebral cortex and brain-stem, and the serious clinical manifestations, in order of frequency, are convulsions, disturbance of mental function and signs referrable to the cranial nerves, but a wide variety of other central nervous system signs and symptoms may occur, including disorders of movement and of hypothalamic function (Honda, 1966).

Involvement of the peripheral nervous system may take the form of a mononeuritis multiplex, thus imitating a carcinomatous neuropathy or polyarteritis nodosa, or the Guillain-Barre syndrome. The mononeuropathies are due to vascular

lesions, but the symmetrical ones are more probably due to some abnormality of immunology rather than structural changes in the vessel walls.

The effectiveness or otherwise of steroids on these neurological manifestations is difficult to determine because they may recover spontaneously without any treatment at all. When convulsions or severe mental disturbances are present the therapeutic dilemma may be extremely taxing. It is of course well known that steroids can promote mental disorders, and indeed convulsions. On the other hand, schizophrenic reactions undoubtedly occur unrelated to the use of steroids, and there are several reports which claim therapeutic benefit from steroids in both affective and schizophrenic incidents. From examining case histories it seems clear that some people become psychotic shortly after the initiation of steroid therapy, and are relieved when the dosage is reduced or the treatment stopped, only to relapse when the previous dosage is restored. Others are relieved, or appear to be, by steroid therapy, and yet others recover without any.

The situation is even more anxious when the patient is experiencing a series of convulsions, or has developed status epilepticus. I personally find this a most difficult problem in the individual case, but my bias is towards increasing the dose of steroids unless they have been very recently instituted, in a patient previously free from all convulsions, on the grounds that if the fits are due to the decrease process, the patient's best hope is in suppressing it, whereas, if the fits are due to steroids, their mistaken continuation for a short time is the lesser of the two evils. Although aneleptic drugs will of course be used in most instances, it is important and rather frightening to remember that patients have developed systemic lupus erythematosus whilst receiving Hydantoin or Primodone for epilepsy.

Pregnancy and Systemic Lupus Erythematosus

Acute systemic lupus erythematosus in pregnancy carries a high maternal mortality rate which, as a result of a review of reported cases (Turner *et al.*, 1955) is put at between 20 and 60 per cent. for the mother, and 30 and 50 per cent. for the foetus. When systemic lupus erythematosus in the mother is sub-acute, she usually survives, but the foetal mortality is still high – about 40 per cent. Patients with discoid lupus erythematosus and no generalisation have not been observed to have any ill effects as a result of pregnancy.

The L.E. factor can pass the placental barrier and tests for it can remain positive for several weeks, or even two to three months in the child. Although there is virtually no risk to the child from this, it is obviously wise for a careful watch to be kept on the haematologic state of a child born of a mother with active systemic lupus erythematosus.

It has been suggested that women with systemic lupus erythematosus tend to have a reduced fertility, but Larson's figures (1961) do little to support this. He found that in the 62 patients of his who were of child-bearing age, there were 38 pregnancies. The present writer's experience has, however, been different, in that out of 31 women of child-bearing age recently studied, there were only 3 pregnancies. Two of these had abortions about the fifth month, and in both the systemic lupus erythematosus was exacerbated, in one with fatal results, whilst the other, who had had the disease for five years before her pregnancy but had previously only suffered from arthralgia, is now disfigured by her skin condition and disabled by arthritis.

The third woman, who first developed systemic lupus erythematosus at the fifth month, was delivered of a normal child, and has had no further symptoms. The child also has remained well. Blood from the umbilical cord showed antinuclear factor (A.N.F.) and L.E. cells, but neither were present some months later.

Only three of the 22 patients reported by Larson who had systemic lupus erythematosus before becoming pregnant were definitely worse during their pregnancy, but five had acute exacerbations shortly after delivery, and two women had an acute onset of the condition in the second trimester. None of the children who were born (22 out of 38 pregnancies) were abnormal, but there were 10 abortions and 6 stillbirths. It seems that there is a real risk to the mother during pregnancy if systemic lupus erythematosus is active, and that there is a high incidence of abortion or miscarriages once the disease is disseminated (Richardson, 1963).

Prognosis

The discoid type of lupus erythematosus may remain ungeneralised and benign indefinitely, although the skin lesions themselves persist in about half of the patients. They can, nevertheless, disappear with little or no residual change. Generalisation, however, occurs in about 10 per cent. of patients (Ingram, 1960), and may alter the whole course of the illness, and with it the prognosis.

Systemic lupus erythematosus is a dangerous disease and even when the course is benign, it rarely disappears entirely, although occasional examples are on record. Dubois (1956) found the mean duration of the illness in patients untreated by steroids was two years, and 80 per cent. of Hill's (1957) patients were dead in five years. In series in which the follow up has been prolonged, more encouraging figures have been recorded. Rupe and Nickel (1959) found that half of their patients were alive at the end of 10 years, and Richardson (1965) one-third of his. One of Rupe and Nickel's patients was alive 34 years from the onset, and two of Richardson's over 25 years.

The type of onset affects the prognosis, and those with an acute onset have a worse prognosis than those in whom it is insidious. The subsequent course of the disease may be relatively benign with a good prognosis in respect of survival. One-third are alive after 10 years from the onset, and have little serious disability; 66 per cent. of the surviving patients find life, at the worst, tolerable, and half of my series regard themselves as well.

A more malignant course with a bad prognosis in respect of life and disability must be feared under certain circumstances. The prognosis is particularly bad in women during the reproductive period of their lives. It is often, like all other diseases of the connective tissue, severely worsened by renal involvement. This however, is not invariably the case, but the earlier a renal lesion occurs in the course of the illness, the worse is its prognostic significance. Widespread arteritis or involvement of the blood-forming organs, with consequent haemolytic reactions, neutropenia or thrombocytopenia, are usually sinister, but both thrombocytopenia with purpura and a haemolytic anaemia can be present for years before a fatal outcome supervenes, or indeed evidence of systemic lupus erythematosus develops.

Treatment

There is no specific treatment for systemic lupus erythematosus, but corticosteroids undoubtedly have a very large place in the management of these patients. When an

adequate dosage is given, the temperature in acutely ill patients begins to return to normal in the majority of instances within 48 hours. Pains in joints and muscles reduce and the general sense of illness diminishes. Skin lesions, serious effusions, glandular and organ enlargements are slower to improve, and the response may be only partial. If anaemia, due to haemolysis, is present, it is soon brought under control and the Coombs' test becomes negative .The number of L.E. cells in the blood is reduced, the E.S.R. diminishes, as does the raised level of the gamma globulins, and the biological false positive W.R. becomes negative.

The immediate outlook for the patient is largely determined by the initial response to full doses of steroids, while the long-term prognosis depends greatly on the ability to control the activity of the disease with small doses, i.e., about 15 mgm. of Prednisone, daily, or less. Pollak and his colleagues (1961) have succeeded in doubling the life span of their patients with a renal lesion with high as compared to low dosage of steroids, but only in those patients whose blood urea was less than 30 mgm. per 100 ml. when the renal lesion was first proved by renal biopsy. If, on the other hand, the lesion is advanced, little benefit can be expected from steroids.

Corticotrophin (A.C.T.H.) is sometimes more effective than are corticosteroids. It can be used in acute exacerbations by adding 20 to 40 units to an intravenous drip of 5 per cent. glucose solution. It can also be given by intramuscular injection in doses of 20 units of zinc corticotrophin twice in twenty-four hours. Corticosteroids are sometimes used in combination with salicylates, and this may lead to the control of symptoms with a lower dosage of steroids. Antimalarial preparations are added to steroids on occasions, but there is little evidence that they have any additional therapeutic effect. They can also be used alone. Chloroquin is usually given in divided dosage, with a total of 150–300 mgm. of base daily. It has a good effect on the rash of lupus erythematosus, but much less on the generalised manifestations. Its mode of action is unknown, but its toxic effects are well recognised. They include nausea, vomiting and headache, bleaching of the hair, and important ocular complications. Transitory difficulty in accommodation and corneal opacities tend to disappear when the drug is withdrawn, but a retinopathy somewhat resembling retinitis pigmentosa may persist.

Valuable as steroids and A.C.T.H. undoubtedly can be in the management of patients with systemic lupus erythematosus, they in no sense provide a complete therapeutic answer, and thus other measures are always being sought.

Antimetabolites are undergoing appraisal at the present time. The theory is that if antibody is produced by actively growing lines of lymphocytes which are especially vulnerable to the action of purine antagonists, these drugs might have an immunosuppressive effect. Although their mode of action is not fully understood, 6-thioguanine (6-T.G.), 6-mercaptoprine (6-M.P.) or one of its derivatives azathioprine, partially block the production of humoral circulatory antibodies, and, unlike cortisone, have some effect on delayed or cellular type of hypersensitivity (Corley *et al.*, 1966). Such clinical benefits as have occurred have been mostly in patients with renal lesions, but in some instances the rashes, fever and arthralgia of systemic lupus erythematosus have been improved even when steroids were not being given in combination with the antimetabolite.

The dosage is critical, since if more than a purely temporary result is to be achieved, enough must be given to threaten some degree of marrow depression. It

may be between 1.25 mgm. to 2.5 mgm. per kilo per day, but must be determined for each individual patient and be controlled by frequent blood counts. The actual preparation chosen will depend upon the physician's experience, but azothioprine has been shown to be considerably more immuno-suppressive in animals and man than its parent substance 6-mercaptoprine (Steiner and Nabrady, 1965). The possibility that the combination of prednisone with an azothioprine preparation may allow the later to be effective in non-toxic doses is being explored.

Before concluding, two points by way of prophylaxic must be made.

Patients with systemic lupus erythematosus are often extremely sensitive to drugs, and great caution must be exercised in their use in these people. No drug whatsoever, and this includes immunising agents, should be given without very careful thought.

Finally, these patients are sun-sensitive, and should be instructed to use an efficient barrier cream, even if exposure to the sun is expected to be for only a matter of minutes. Homely advice, but a good note on which to end.

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THE TREATMENT OF PILONIDAL SINUS BY PHENOL INJECTION

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INTRODUCTION

THE purpose of this survey was to establish whether the treatment of pilonidal sinus by a conservative method, viz. by the injection of phenol, was sufficiently successful to warrant using it routinely.

Pilonidal sinus is a relatively minor surgical condition, although not all patients would regard it in this light. It is most often treated by radical operation which usually involves a lengthy stay in hospital and considerable time off work. While not quite analogous to using a 'sledge-hammer to crack a nut', it still would appear to be a time consuming method for the routine treatment of the condition.

Many different techniques have been tried but the most usual way of dealing with this condition is by excision and saucerization, leaving the wound to slowly granulate; more recently, excision followed by primary suturing has also been popular. While these methods can be very successful post-operative treatment is prolonged and a surgical hospital bed is blocked perhaps for several weeks. Mainly for this reason it was decided that a more conservative procedure should be tried which would mean a much shorter stay in hospital, early return to work and also, one hoped, give equally good results.

AETIOLOGY

Pilonidal sinus is still generally agreed to be acquired. The condition was first described in 1847 (according to Dwight and Maloy, 1953), but did not receive its name, 'pilonidal', until Hodge so referred to it in 1880. Many different theories have been held concerning its origin. Following the work by Raffman (1959) however, evidence for an acquired aetiology was convincing; also Brearly (1955, 1959) and Palmer (1959) offered impressive theories as to how the hairs gain entrance to the skin and lead to the formation of a sinus. The findings of Patey and Scarff (1946, 1955) and Currie, Gibson and Goodall (1953) in the study of pilonidal sinuses occurring in barber's hands also stimulated this belief. However, Weale (1955) ascribes to the development theory of origin and in a more recent communication (1964) concluded that the post-anal variety is a sequestration dermoid whereas the barber's sinus is an implantation dermoid. Indeed, he also points out that healing, following phenol injection into post-anal sinuses, is most likely due to epithelial destruction and that hair extraction is not essential to cure, arguing therefore, that hair is hardly the prime cause of the condition.

METHOD

The method adopted was one first described by Maurice and Greenwood in 1964. It consists of injecting phenol without pressure into the main sinus tract in order to cause destruction of the lining epithelium and the sterilization of infected contents,

together with removal of any embedded hair or debris. This technique had been used before by Mimpriss (1961) as a prelude to laying open the sinus tract and leaving it to granulate. The results of Maurice and Greenwood had indicated that this method might fulfil the conditions mentioned above.

Technique

The patient is placed in the prone position after anaesthesia is induced with endotrachael intubation. The legs are then lowered to about 45° below the horizontal so as to expose the sacral area. The skin of the area is cleansed first with Savlon and Hibitane, following which it is dried. The skin around the sinus is protected by smearing liberally with vaseline and the anus protected by covering with vaseline gauze. After gentle probing the main sinus tract is injected with phenol using a blunt-nosed needle or an angiocath cannula, which should be a good fit in the sinus opening. Eighty per cent phenol is used and the injection is done slowly using the minimum of pressure. The injection is stopped when phenol is seen to issue from any side openings and any excess is quickly wiped away. After one minute, pressure around the sinus tract expresses the phenol and also usually brings loose hair to the surface, which is then picked out. This whole procedure is repeated twice, each time leaving the phenol in situ for one minute before expression and removal of any hair or debris; a total exposure time of 3 minutes is thereby obtained. Vaseline gauze is then applied to the injected area and a light dressing applied. Strict precautions are necessary throughout the procedure, especially in the handling of the phenol, to ensure it does not come into contact with the skin or eyes. Following injection the patient should have frequent baths and strict hygiene of the area is emphasized during the healing stage.

Survey and Results

A survey was undertaken of the cases treated by injection so far and also included were cases treated surgically at this hospital within the last five years. A total of 73 patients were reviewed made up as follows:

Table I

Procedure	*No. of Cases*
Phenol Injection	30
Excision and Saucerization	32
Excision and Primary Closure	8
Incision and Curettage	2
Phenol Injection and laying open	1

Out of the 43 cases dealt with surgically, 6 recurred – i.e. developed a discharging sinus again – and required further surgery; this means a cure rate of 86 per cent was attained. The patients in this group were followed up for approximately 9 months after operation but were largely reviewed again for this series; a few could not attend and were sent questionnaires. The length of time spent in hospital on average was 20.6 *days* for this group. The average time off work was calculated and this was 33.6 *days*.

Thirty cases were treated by injection. These patients were unselected but it was explained to them that surgery could still become necessary should conservative treatment fail. The cases had originally presented as follows:

TABLE II

Presenting Features	*Cases (Number)*
(i) Discharging sinus	13
(ii) Recurrent sacral abscesses	8
(iii) Sacral abscess which had required incision at Casualty	6
(iv) Recurrence of sinus following surgery	2
(v) Bleeding P.R.	1

The series consisted of 20 males and 10 females. The average age was 27 *years*, the range being 18–43 years.

Out of the 30 cases, 8 were not satisfactory and were counted as failures. The length of the follow-up period in this series was over 18 months for the majority, but a few cases which were reviewed had been injected within the last year. However, they were subjected to the same rigid criteria for success or failure. Cessation of discharge was adjudged the most important single factor, with the absence of pain or swelling, and closure of the sinus tract also essential criteria for success. This meant a cure rate of 73 per cent was attained. Three of the successful cases required a further 2nd injection of phenol before complete healing was obtained. The average length of hospitalisation for this group was 2.9 *days* while time off work on average amounted to 11.6 *days*.

COMMENT

The figure for the length of time spent in hospital is slightly higher than it should be as most patients came into hospital the day prior to operation and were discharged the morning of the day after. However, some of them stayed a day longer than was strictly necessary following injection; also one patient who developed an abscess following injection had a prolonged stay. Following discharge the patients were encouraged to return to work as soon as possible but a few stayed off until

TABLE III

Method	*Average Hospitalisation*	*Average Time Off Work*	*Longest Hospitalisation*	*Longest Time Off Work*
Injection	20.6	33.6	49	105
Surgery	2.9	11.6	9	90 x

(The above figures were calculated in days)

the end of a week or else took 2 weeks holiday as a matter of course – this rather spoiled the figure for the average time off work in this group. Another factor which affected this latter figure was again the prolonged convalescence of one (x) of the patients who developed the abscess.

Following injection, most patients had slight discomfort for a few days. The majority of the cases took 3–4 weeks for complete healing to take place and during this time there was usually a little serious discharge from the sinus. One patient had intermittent discharge and discomfort in the sacral region for nearly eleven months, before it finally healed.

It was noticeable that of the failures, 3 cases had 3 or more sinus openings present in the sacral area and all had been discharging heavily prior to injection. In two of these cases more than one main sinus tract was found. Another case had still some residual inflammation present at the time of injection, following a recent flare-up. A further case was discovered during the phenol injection to have a small abscess cavity in continuity with the main sinus tract. It was incised and drained at this time. One wonders what effect a pre-injection course of an appropriate antibiotic (after culturing and determining the sensitivity of the responsible organism), might have had in these five cases.

Two cases had undergone previous surgery. It has been accepted that this type of case is difficult to treat, mainly because of scar formation and poor blood supply, and probably is best dealt with by open surgery. The remaining case, already mentioned, developed a painful swelling after the injection; this became an abscess which was heavily infected. The necrotic area separated spontaneously leaving an ulcer which healed slowly by granulation. This was undoubtedly caused by leakage of phenol into the surrounding tissues due to either too much pressure at the time of injection, or to opening up a false tract by too vigorous probing.

Three of the cases which failed had subsequent excision and saucerization of the sinus performed, two with a good result; the other case has still not fully healed.

TABLE IV

Method	*Number of Cases*	*Number of Cases Recurred*	*% Success*
Surgery	43	6	86
Injection	30	8	73

Although the percentage cure rate was slightly below that for surgical methods, the method is thought to be sufficiently successful to warrant using it as a routine for most cases of pilonidal sinus. Ideally, the injection should be done at a quiescent phase. A pre-injection course of the appropriate antibiotic might be useful in some cases. Cases which have had previous surgery are probably best dealt with surgically again. Taking the above into consideration this success rate could probably be improved upon.

The very short period of hospitalisation and early return to work, together with a cure rate of over 70 per cent must make this method an attractive proposition for dealing with this troublesome condition.

SUMMARY

The results of 30 cases of pilonidal sinus treated by phenol injection are presented. A cure rate of 73 per cent was obtained. Hospitalisation and convalescence were significantly reduced in comparison with those treated by operation.

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ADMISSION OF CHILDREN TO HOSPITAL

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and SHEILA MILLAR, S.R.N., S.C.N., Dip.Soc.St.
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STUDIES on the admission of children to hospital (Taylor and Davidson, 1959; Illingworth and Knowelden, 1961; and Apley, 1961) have shown that the numbers requiring admission appear to be increasing year by year despite improvements in the standard of living and the widespread use of antibiotics. Criteria for hospital admission are as difficult to generalise for children as they are for adults but two additional factors have to be taken into account. One is the possible psychological trauma caused by separation of young children from their parents where admission of mother with child is not possible and the second is the greater hazard of cross infection in infants' wards. Since these factors weigh against admission the assessment of the reasons for admission assume increased importance. It seems to us that a decision to admit depends on two main sets of circumstances – the severity or potential severity of the illness and the conditions in the home. At one extreme, serious illness requires admission regardless of home conditions and at the other extreme where home conditions are very bad, admission may be required for even trivial disorders. In this hospital it has been accepted that the general practitioner had knowledge both of the child's illness and the home background and was therefore the person best qualified to decide whether admission to hospital was necessary. Therefore, children referred for admission are accepted if beds are available. However, it seemed to us that an increasing number of infants with only minor illnesses were being admitted to the wards and it was decided to try and evaluate the medical and social reasons for admissions of a sample of infants and children under five years during the winter of 1967/68.

METHOD

Two samples, one of a hundred infants of one week to two years and one of fifty infants between two and five years was chosen successively from the acute admissions to the children's medical wards of the Belfast City Hospital in the winter of 1967/68.

The first three admissions from the Belfast urban area in the age and type category were selected by the social worker each week day on which she was available for visiting. On some days less than three admissions fell into the appropriate category but there was no evidence that the method of choice of sample produced a bias. These children received normal investigations and treatment during their stay in hospital and normal records were kept. The medical staff were not aware of which cases had been included in the sample. Concurrently the social worker visited the child's mother at home and assessed the housing conditions, the standard of cleanliness and the capability of the mother. These were recorded on a form. Copies of this can be obtained from the authors.

The home records were subsequently matched with the medical records and the medical member of the team attempted to make an objective allocation of all the children to one of two categories. The first group consisted of those who required

hospital admission, the second those children who could have been nursed safely at home with a daily visit from their general practitioner.

In every case an attempt was made to justify admission.

TABLE I

	Number	*Admission Necessary*	*Admission Unnecessary*
Infants 0–2 years	100	60	40(40%)
Infants 2–5 years	50	37	13(26%)
Total	150	97	53(36%)

Table I gives the results of the assessment as to whether the infants required hospital care. A much higher percentage of the admissions in the 0–2 year age group (40%) were thought to be unnecessary than in the 2–5 year group (26%).

The home conditions were on average worse in the children whose admission was necessary. There was no direct correlation as this group not only included those children who required admission because of their poor home conditions but also many infants with excellent home conditions but with serious illnesses.

Forty-three per cent of the houses visited had no separate bathroom. This agrees with the 1961 census figures which recorded 47.7 per cent of all Belfast houses as having no fixed bath. Overcrowding was present in thirty-one homes, that is 20 per cent of all the houses visited. By this is meant more than two persons per room. The 1961 census gives a figure of 2.2 per cent for overcrowding, so that this would appear to be an important factor in infant morbidity.

In seventeen of the houses the conditions were so appalling that admission was obviously required for any complaint. The comment on the back of one form was as follows. "This home is literally filthy. The parents are in poor health and in debt and a police case is pending regarding the child of eight who was cut in the face with a milk bottle during a fight in the street. The house itself is crumbling with rotten floor boards, broken windows and rain coming through the ceilings. The children have no bedding except rags but the carry-cot in the kitchen is reasonably clean". Another comment was, "A mill cottage in disrepair and decay. Furniture consists of a chair, a card table and three beds for a family of eight, Mrs. G. had just delivered herself of a baby during the night".

Table II gives the diagnosis and from this it can be seen that respiratory infections were present in 80 per cent of those infants not requiring admission.

Table III separates the patients into three groups according to whether they were admitted by their general practitioner, the contactor's bureau (a locum supplying agency) or a hospital casualty department. The percentage of unnecessary admissions from each group was very similar.

Mothers were asked if they could have nursed their baby at home with additional help, and 60 per cent expressed a desire to do so. Sixteen per cent of mothers said they would be able and willing to go into hospital with their baby.

TABLE II

Diagnosis	*Admission Necessary*	*Admission Unnecessary*
Bronchitis	17	21
Pneumonia	19	0
U.R.T.I.	1	13
Bronchiolitis	13	3
Bronchial spasm	3	5
Influenza	5	1
Febrile convulsion	16	0
Pyelonephritis	3	0
Meningitis	2	0
Vomiting	2	1
Hypocalcaemia	2	0
Skin rashes	1	5
Congenital laryngeal stridor	0	1
Croup	1	1
Epilepsy	0	1
Herpes Simplex	0	1
Bad home conditions alone	2	0
Miscellaneous	10	0

TABLE III

Admission arranged by	*Number*	%	*Admission Unnecessary*	%
General Practitioner	110	73	39	35
Contactor's Bureau	23	15	7	30
Hospital Casualty Extern	17	11	7	41

COMMENTARY

If one accepts the validity of these assessments it would appear that in this series 30 per cent of admissions were unnecessary, the percentage of unnecessary admissions being similar whether the admitting doctor was the general practitioner, a doctor from an agency or a house physician in the casualty department of a hospital. Infants who are admitted to hospital not only run the risk of acquiring a hospital infection but may also suffer considerable psychological stress. If some of them could be nursed at home it would obviate these risks and would also relieve the chronic shortage of infants cots for those whose admission to hospital was essential.

The reasons for these unnecessary admissions are difficult to define but they would certainly be decreased by an increased confidence on the part of both parents and doctors in the accuracy of the diagnosis and the efficiency of the treatment. In this respect an extension of paediatric teaching at both undergraduate and postgraduate levels specifically designed to increase knowledge and experience of the small infant would be of value. The formation of group practices where one member had a special interest and experience in paediatrics would also help. A more

immediate solution might be the formation of a home care paediatric team whereby the general practitioner is assisted by a paediatrician and nurse in the day to day care of infants who might otherwise have been admitted to hospital. A scheme of this nature has been run by St. Mary's Hospital Medical School for the past fifteen years.

Summary

The circumstances surrounding the admission of one hundred and fifty infants to hospital have been investigated. On the basis of these findings it was decided that 36 per cent of these admissions could have been safely nursed at home. Some measures have been suggested which might enable more of these infants to remain in their own homes.

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MYELOGRAPHY FOR CLINICALLY ATYPICAL PROLAPSED LUMBAR INTERVERTEBRAL DISCS

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IN a significant number of cases of posterior prolapse of a lumbar intervertebral disc there is doubt as to the cause of symptoms and of the level affected. Contrast myelography is frequently used in this type of case in the hope that a more definite answer may be given. Reports on the accuracy of myelography in the diagnosis of prolapsed lumbar intervertebral disc vary between 67 per cent and 95 per cent (Scoville, Moretz and Hankins, 1948; Camp, 1939; Soderberg and Sjoberg, 1961), and as there is a wide variation between these figures it was decided to report the experience with myelography at the Orthopaedic Unit of Musgrave Park Hospital.

In this unit myelography is not carried out routinely in all cases of suspected prolapsed lumbar disc. It is reserved for those which are not clinically typical, and in whom operation is contemplated when conservative treatment has failed.

METHOD

The accuracy of the myelography findings was checked in all patients who had had myelography followed by lumbar hemilaminotomy or hemilaminectomy for suspected prolapsed disc, between 1960 and 1966 inclusive. During this seven year period the operations were carried out by nine orthopaedic surgeons but almost all the myelograms were screened by one radiologist.

The myelogram reports were graded in one of three groups:

1. Those myelograms showing a definite or probable prolapsed disc.
2. Those showing a possible prolapsed disc.
3. Negative. i.e. no prolapse shown by the myelogram.

In the period under study 354 patients had surgical exploration for suspected prolapsed lumbar disc. One hundred and forty-three of these patients had preoperative myelography. This report is therefore confined to the accuracy of myelography in these 143 cases.

In some reports on the accuracy of myelography each myelogram is recorded as correct or incorrect. However, in a significant number of cases this may not be adequate. A myelogram may suggest a prolapse at two disc spaces but a prolapse may be found at one only. In this case, the report has been right once and wrong once. A report may suggest a prolapse at, for example, the L4/5 disc space and a prolapse at the L5/S1 space may be found at operation. In this instance the myelogram has suggested a prolapse where none existed and not shown one where it did exist. The report has, in fact, been wrong twice. For this reason, the accuracy of the myelogram at each individual disc space has been recorded. During the period under study only 2 per cent of prolapsed discs were at the L3/4 level and the remaining 98 per cent were at the L4/5 and L5/S1 levels. This study is therefore confined to the accuracy of the myelograms at the L4/5 and L5/S1 levels, as there were in-

sufficient numbers at the L3/4 level to give meaningful results. The report on each myelogram was considered to have included the L4/5 and L5/S1 disc spaces. Had both these spaces been exposed at operation it would have been possible to comment on the accuracy of myelography at a total of 286 spaces (two spaces for each of the 143 patients surgically explored).

Technique of Myelography

One hour prior to myelography mild sedation was administered when this was considered necessary. The patient lay in the lateral position, and the skin was prepared with a skin antiseptic. A midline site was selected either between the third and 4th lumbar spines, or between the fourth and fifth spines and the area was infiltrated with a local anaesthetic. Lumbar puncture was performed, and when a good flow of cerebrospinal fluid indicated that the tip of the needle was in the subarachnoid space, 5 ml. of fluid was removed for analysis. Four to 6 ml. of "myodil" was then slowly injected. To ensure that the tip of the needle remained in the subarachnoid space throughout the injection of the myodil, several test withdrawals of cerebrospinal fluid were carried out during the injection process. After injection of the myodil the needle was withdrawn, and the patient was placed on a tilting fluoroscopic table. The column of myodil was studied in positions from the horizontal to the vertical, in the anteroposterior, lateral, and oblique views. The myodil was not routinely removed after screening.

Results

Myelography failed for technical reasons in 14 out of the 143 cases. In 13 of these the myodil was injected extradurally and the remaining patient was intolerant to tipping while being screened. This left 129 patients with technically successful myelograms. In these 129 cases the L4/5 disc space was exposed at operation in 107 cases and the L5/S1 space was exposed in 93 cases. Thus the accuracy of the myelography could only be assessed at 200 disc spaces as against a theoretical maximum of 258 spaces, had both disc spaces been exposed at operation in all 129 patients.

Table I shows the results obtained.

Table I

The accuracy of myelography at the two disc spaces, as found at operation

Myelogram report		*Myelogram report found correct at operation*	*Myelogram report found incorrect at operation*
Definite or probable prolapse	at L4/5	47	10
	at L5/S1	22	8
Possible prolapse	at L4/5	3	12
	at L5/S1	14	9
No prolapse	at L4/5	28	7
	at L5/S1	25	15

Discussion

There are certain inherent inaccuracies in assessing these results. The surgeon may explore the wrong disc space and not appreciate his mistake, or a slight posterior bulge of a disc may be interpreted by one surgeon as a prolapse, while another may consider it to be within normal limits. There should be fewer variations between the myelogram reports, as almost all were given by the same radiologist.

Table II

The relative accuracy of myelography at the two disc spaces

Myelogram report	*Percentage of reports correct*	*Percentage of reports incorrect*
At L4/5	73%	27%
At L5/S1	66%	34%

Table II compares the accuracy of myelography at the two disc spaces. The accuracy at the L4/5 level appears to be slightly better than that at the L5/S1 level. However, when this difference was analysed statistically no significant difference was shown. It would be reasonable on clinical grounds for such a difference to exist, as the theca at the L5/S1 level may be displaced posteriorally away from the disc, or a short cul-de-sac may occur at this level. There were five myelograms in which the radiologist commented that the theca was so far back at the L5/S1 level that he could not be confident about the negative myelogram at that level. In four of these five cases a prolapsed L5/S1 disc was subsequently found, but these figures are too small to be statistically significant. All that can be said is that while there may be a small difference in the accuracy of myelography at the two levels, it does not appear to be of much significance, with the possible exception of those cases with a posteriorally displaced theca at the L5/S1 level, or a high cul-de-sac. In these cases the accuracy of myelography at the L5/S1 level may be quite low, but more cases would be needed before this could be statistically proven.

Seventy per cent of the myelogram reports at the individual spaces were correct, and 30 per cent were incorrect. In comparing these results with those of other reports, two points must be considered. Firstly this method of analysis at each disc space separately, rather than taking the myelogram as a whole, is a severer test of the accuracy of myelography. Certainly these results do fall towards the bottom of the range of accuracies which have been reported. Secondly, the accuracy rate must be corrected for the technical failure rate of 10 per cent. When this is allowed for the final figures are: in 10 per cent of the disc spaces no answer was given owing to technical failure, in 63 per cent the correct answer was given, and in 27 per cent the wrong answer was given.

If the myelograms were analysed in the more usual manner and not at the individual disc spaces, and the technical failures were ignored, then 80 per cent of those myelograms showing a definite or probable prolapse were correct. I feel that the 63 per cent correct from the first set of figures more accurately reflects the usefulness of the procedure in our hands.

These results raise two main problems. Can the technical failure rate be lowered, and can the accuracy at the individual disc spaces be increased? Of the 14 technical

failures in the series, 13 were due to extradural myodil. In all cases the lumbar puncture and myodil injection was carried out by a reasonably experienced surgeon. Shapiro (1962) states that the myodil injection should be carried out under fluoroscopic control. This has not been done here, and it is possible that this would considerably reduce the incidence of extradural myodil. It does, however, considerably increase the time required by the radiologist. There are two simpler measures which do not have this drawback. With the patient in the lateral position, it is difficult to avoid some lateral curveature in the lumbar spine, and this makes accurate penetration of the theca in the midline difficult. If lumbar puncture is performed with the patient sitting up, it is easier to eliminate lateral spinal curveature, and thus easier to obtain an accurate midline lumbar puncture. Furthermore, lumbar puncture should be routinely carried out at the L3/4 interspinous level. The very great majority of disc prolapses occur at the L4/5 and L5/S1 levels, and an extradural pool of myodil at the L3/4 disc level will not obscure the two lower levels, and prevent a subsequent successful injection of myodil. As it is important to ensure that the lumbar puncture is carried out at the L3/4 level, a routine "marker" film should be taken before the lumbar puncture is carried out.

The results do not reflect very favourably on the accuracy of myelography in our hands. Four to 6 ml. of myodil has been used, and this appears to be common practice. Shapiro (1962) states that a minimum of 12 ml. should be used, and if the posterior border of the vertebral bodies is concave, up to 24 ml. He states that the incidence of post-myelographic sequelae is no higher after using such large amounts of myodil, but he removes the myodil under fluoroscopic control after screening. Ford and Key (1950), on the other hand, believe that using a large amount of myodil reduces the accuracy, as the larger myodil column is less mobile and it is important to observe the head of the myodil column as it moves. As we are not removing the myodil under fluoroscopy we do not feel that it would be justified to use large amounts of myodil in the subarachnoid space, in view of the risk of post-myelographic sequelae.

Myelography has been of only limited assistance to us in the diagnosis of the clinically doubtful prolapsed disc. In 7 patients who had negative myelograms for both disc spaces, and who were subsequently explored, 5 were found to have a prolapsed disc. In these cases the clinical picture had become more typical, and the decision to ignore the myelograms was amply justified by the operative findings. This supports the conclusion of Scoville, Moretz and Hankins (1948) that a negative myelogram should not be allowed to prevent operation if the clinical picture suggests a prolapsed disc.

Myelography was, however, of assistance in 4 cases of spinal canal tumours which presented as atypical disc lesions, and it does have a definite, though limited, place in the diagnosis of posterior prolapsed lumbar intervertebral discs.

Summary

1. The accuracy of myelography, as confirmed at operation, was assessed at 200 disc spaces in 129 patients.

2. There was a sigificant technical failure rate due to the extradural injection of the contrast medium, and measures are suggested to reduce this.

3. A negative myelogram should be ignored in the presence of a convincing

clinical picture of a prolapsed disc.

4. Myelography was useful in eliminating tumours in the spinal canal, but gave only limited assistance in the diagnosis of clinically doubtful posterior prolapsed lumbar intervertebral discs.

ACKNOWLEDGMENTS

I wish to thank the orthopaedic surgeons of Musgrave Park Hospital for permission to include their patients in this study.

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BOOK REVIEW

ULCERATIVE COLITIS. By J. C. Goligher and Associates (Pp. 374; figs. 114. 85s). London: Baillière, Tindall & Cox, 1968.

THIS book will be welcomed by everyone interested in the management of ulcerative colitis. This is the first authoritative and comprehensive review in British literature for many years giving the combined surgical and medical views of the leading authorities on diseases of the colon in Britain. The admirable balance and combination of medical and surgical treatments shows no bias towards medicine or surgery. The necessity for combined assessment and follow up are stressed in the diagnosis and therapy of this difficult and troublesome disease.

The survey of epidermiology covers the world literature and the section on pathological features of the inflammatory and ulcerative conditions of the colon is concise and well illustrated. The statistical analyses of a large series of cases have been carefully prepared and presents precise information on the results of both medical and surgical treatments in the first and subsequent attacks.

The text and illustrations on surgical technique should be most helpful to surgeons dealing with this complex problem. The text and production leave nothing to be desired. This book should be the standard reference for both physician and surgeon dealing with granulomatous diseases of the colon. W.W.

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BOOK REVIEWS

SELECTED TOPICS IN MEDICAL GENETICS. Edited by C. A. Clarke, M.A., M.D. Sc.D., F.R.C.P. (Pp. x+282; figs. 39. 80s). London, Oxford University Press, 1969.

THE rapid progress and the growing interest in medical genetics during the past decade, has inevitably brought in its train a number of specialist volumes dealing with particular aspects. This volume, the latest in the excellent series of the Oxford Monographs on Medical Genetics, is a collection of papers by the members of the Nuffield Unit of Medical Genetics in Liverpool, each of whom is interested in a clinical aspect of genetics. With so many authors, the standard of presentation is bound to be variable. However, this book is well produced and surprisingly easy to read. The chapters are concise and good use has been made of tables and pedigrees.

The first chapter deals with some of the pitfalls and problems which may arise in genetic studies such as anticipation, phenocopies, consanguinity, family aggregation of diseases not due to genetic factors and the selection of controls. Other sections are devoted to the concepts of polymorphism and of linkage and association. The chapter on pharmacogenetics by D. A. Price Evans is particularly valuable. The variable response to drugs may be determined by the genotype of the patient and the striking side-effects (e.g. succinylcholine sensitivity or anticoagulant resistance) may indicate the existence of a genetic polymorphic system. Indeed, it is conceivable in future that drug therapy may have to be planned on a much more personal basis than is now the case. D. G. Weatherall and J. B. Clegg who have made many useful contributions to medical genetics, discuss disorders of protein synthesis with special reference to the haemoglobinopathies.

The Nuffield Unit has been concerned with the prevention of haemolytic disease in Rhesus incompatability and this topic is discussed by J. C. Woodrow. With the increasing measure of success in renal transplantation, transplantation of other organs notably heart, lungs and liver has now begun. R. Harris discusses the methods used to study leucocyte antigens and the evidence that these antigens are concerned with graft survival. Other essays, though less exhaustive, deal with the genetics of schizophrenia, diabetes mellitus, amyloidosis, porphyria, gastrointestinal disease, and chromosome abnormalities in abortion and leukaemia.

Clearly this book has to be read by those interested in medical genetics but all clinicians would benefit by dipping into it, where they would discover that medical genetics is no longer devoted to the study of remote peculiarities but is concerned with medical problems of current interest. It emphasises the fruitful relationship between clinical and genetical research. N.C.N.

OBESITY AND ITS MANAGEMENT. By Denis Craddock. (Pp. ix+191. 35s). Edinburgh and London: E. & S. Livingstone Ltd., 1969.

"SUCCESSFUL MANAGEMENT (of obesity) when it does occur is the result of a knowledgeable, sympathetic physician having the time and the interest to meet repeatedly with a patient who has at least a modicum of insight into the condition and a considerable motivation to reverse it."

The above quotation is included in Dr. Craddock's book and this is in fact what the book is largely about. Dr. Craddock is a family physician in practice in Croydon and he describes his experiences in the long term management of a group of obese patients in his own practice. In addition he provides background chapters on the theory and management of obesity that are soundly based, in that some of the usual myths with regard to this condition are not perpetuated. Useful addenda of diets, standard weight tables, are included.

Who should read the book? Intelligent patients and other family doctors, yes, as a source of commonsense in the management of obesity. It does, however, fall short as a standard text book on the subject of obesity, except that one should acknowledge that many of the chapters are distinguished by the recent nature of some of the references to scientific research on the subject. J.A.W.

BOOK REVIEWS

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THE rapid progress and the growing interest in medical genetics during the past decade, has inevitably brought in its train a number of specialist volumes dealing with particular aspects. This volume, the latest in the excellent series of the Oxford Monographs on Medical Genetics, is a collection of papers by the members of the Nuffield Unit of Medical Genetics in Liverpool, each of whom is interested in a clinical aspect of genetics. With so many authors, the standard of presentation is bound to be variable. However, this book is well produced and surprisingly easy to read. The chapters are concise and good use has been made of tables and pedigrees.

The first chapter deals with some of the pitfalls and problems which may arise in genetic studies such as anticipation, phenocopies, consanguinity, family aggregation of diseases not due to genetic factors and the selection of controls. Other sections are devoted to the concepts of polymorphism and of linkage and association. The chapter on pharmacogenetics by D. A. Price Evans is particularly valuable. The variable response to drugs may be determined by the genotype of the patient and the striking side-effects (e.g. succinylcholine sensitivity or anticoagulant resistance) may indicate the existence of a genetic polymorphic system. Indeed, it is conceivable in future that drug therapy may have to be planned on a much more personal basis than is now the case. D. G. Weatherall and J. B. Clegg who have made many useful contributions to medical genetics, discuss disorders of protein synthesis with special reference to the haemoglobinopathies.

The Nuffield Unit has been concerned with the prevention of haemolytic disease in Rhesus incompatability and this topic is discussed by J. C. Woodrow. With the increasing measure of success in renal transplantation, transplantation of other organs notably heart, lungs and liver has now begun. R. Harris discusses the methods used to study leucocyte antigens and the evidence that these antigens are concerned with graft survival. Other essays, though less exhaustive, deal with the genetics of schizophrenia, diabetes mellitus, amyloidosis, porphyria, gastrointestinal disease, and chromosome abnormalities in abortion and leukaemia.

Clearly this book has to be read by those interested in medical genetics but all clinicians would benefit by dipping into it, where they would discover that medical genetics is no longer devoted to the study of remote peculiarities but is concerned with medical problems of current interest. It emphasises the fruitful relationship between clinical and genetical research. N.C.N.

OBESITY AND ITS MANAGEMENT. By Denis Craddock. (Pp. ix+191. 35s). Edinburgh and London: E. & S. Livingstone Ltd., 1969.

"SUCCESSFUL MANAGEMENT (of obesity) when it does occur is the result of a knowledgeable, sympathetic physician having the time and the interest to meet repeatedly with a patient who has at least a modicum of insight into the condition and a considerable motivation to reverse it."

The above quotation is included in Dr. Craddock's book and this is in fact what the book is largely about. Dr. Craddock is a family physician in practice in Croydon and he describes his experiences in the long term management of a group of obese patients in his own practice. In addition he provides background chapters on the theory and management of obesity that are soundly based, in that some of the usual myths with regard to this condition are not perpetuated. Useful addenda of diets, standard weight tables, are included.

Who should read the book? Intelligent patients and other family doctors, yes, as a source of commonsense in the management of obesity. It does, however, fall short as a standard text book on the subject of obesity, except that one should acknowledge that many of the chapters are distinguished by the recent nature of some of the references to scientific research on the subject. J.A.W.

HANDBOOK OF COMMUNICABLE DISEASES AND SCHOOL HEALTH: A guide for Medical Officers of Schools. By the Medical Officers of Schools Association. Fourteenth Edition. (Pp. xii+141. 15s). London: J. & A. Churchill, 1969.

THIS is the fourteenth edition of a handbook that first appeared in 1885 issued by the Medical Officers of Schools Association, because, to quote the preface to the first addition, ". . . claiming immediate attention was the need for the general adoption of more definite rules for guarding our great educational establishments from the outbreak and spread of preventible infectious disease." The greater part of the book still deals with communicable disease in the form of an alphabetically arranged catalogue from Bornholm Disease to Worms, under the headings, Definition & Cause, Diagnosis, Infection and Transmission, Incubation Period, Period of Communicability, Immunity, Prevalence, Methods of Control, Treatment, and Return to School. The list covers all the common communicable diseases in this country including trichomonas and the venereal diseases, and although it treats them more briefly than its nearest rival the similarly sized Control of Communicable Diseases in Man, of the American Public Health Association, the handbook is more up to date in many respects. For example, the mysterious epidemic syncope and immunisation against measles are included. Rubella and pregnancy are thoroughly discussed including the desirability of immunity to rubella in girls at an early age. Among diseases which are troublesome in Ulster plantarwarts and scabies are well described, but it is surprising to find that no exclusion from school is advised for ringworm, that no mention is made of contact tracing with Wood's light for the fluorescent types of Tinea Capitis nor brush-and-comb culture for the non-fluorescent, and the role of pet cats and dogs in spreading the disease is not emphasised.

The text is for the most part attractively written and unequivocal, though the entry under the heading Food Poisoning Immunity, "None per se", may leave some readers in doubt. Pages 119 to 126 were missing from the reviewer's copy, but the book is singularly free from typographical and alignment errors, and has a fresh, uncluttered, and consistent layout that makes for quick and easy reference.

As well as communicable diseases the handbook now includes sections on some other aspects of the school medical officer's work such as hygiene, disinfection, immunisation, adolescence, medical examinations, and health education. Some of these matters are dealt with so briefly as to emphasise that we are reading a handbook rather than a textbook; Dental Supervision, for example, gets five lines advising that treatment be obtained during holidays unless the parents are overseas. A notable exception is the excellent article on menstruation which is modern in approach and deals quite fully with the problems of dysmenorrhoea, menorrhagia, menstrual irregularity, and amenorrhoea. It discusses hormone therapy, internal tampons and anaemia in schoolgirls, and the advice is clear, practical, and confident. This article is a model of its kind and will be of great value for health visitors and others who have to advise pupils, parents, and teachers on menstrual problems, and to prepare material for health education. Adolescence is also treated at some length and the topics dealt with include alcohol, smoking, drugs, sexual problems, and emotional disorders. In this section the author is less assured, and it is difficult to agree with the passage on emotional disorders which begins, "Although the school Medical Officer may not have many cases of emotional instability to deal with, he will find that they can take up a lot of his time. It is a truism to say that, although adolescence is physically the fittest time in life, emotionally it is the sickest. The school Medical Officer is at a considerable disadvantage in dealing with such cases". In spite of the gloomy despair of this passage the problems of promiscuity, homosexuality, and masturbation in the young are given very sympathetic consideration.

This handbook is written very much from the point of view of the part-time school doctor at a fee-paying residential private school and much of it will read quaintly to local authority doctors, who will scan the index in vain for the subjects which occupy most of their time and energy such as handicapped pupils, intelligence, educational subnormality, defects of vision and hearing, truancy, school refusal, broken homes, child guidance clinics. Local authority doctors who regard the whole of their work and indeed the whole contents of this book as preventive medicine will also be surprised to find this term used to head a half-page article on Physical Conditions (fresh air, etc.), Behaviour Problems, Rest and Exercise, and Risks from

Accidents. They will also find that the Education Acts are not mentioned and that the book is hazy on relationships affecting the school doctor, the headmaster, the Medical Officer of Health, and the Local Education Authority. Many will disagree also with the advice that "a routine chest X-ray from the age of 13 is desirable", and will wonder that a first-aid box is necessary in the kitchen, but is not asked for elsewhere in the school.

Nevertheless, the main part of the book is on communicable diseases and here it is difficult to find faults. No school doctor can afford to be without a copy in the glove compartment of his car. A.L.W.

LIVINGSTONE'S POCKET MEDICAL DICTIONARY (LOIS OAKES). By Nancy Roper, S.R.N., R.S.C.N., R.N.T. Eleventh Edition. (Pp xvi+590. 9s 6d). Edinburgh and London: E. & S. Livingstone, 1969.

THIS little book first published in 1933 is in its eleventh edition and has been many times reprinted. It has thus proved itself as a valuable aid, and it continues to fill an important place. It contrives to give much information in small space and, indeed, in some respects is more informative than some larger dictionaries. As well as brief, usually excellent, definitions it includes many relevant abbreviations, notes on urine testing, physiological normal values and even the telephone numbers of regional poison information centres. This book will be of great value to nurses and to the many ancillary workers in medicine. Many medical men will find it useful and, while not all will agree with all details of usage, it is a useful guide to all but the more specialised words in medicine.

DISEASES OF THE NOSE, THROAT AND EAR: A Handbook for Students and Practitioners. By I. S. Hall and B. H. Coleman. Ninth Edition. (Pp. xii+443; figs. 88. 35s). Edinburgh and London: E. & S. Livingstone, 1969.

THE ninth edition, appearing two years after the eighth, contains minor alterations and some new illustrations. In the treatment of sinusitis in children, antrum lavage and the indwelling tube is mentioned for the first time, although in general use for some years. There is now a short note on glandular fever and another on miscellaneous conditions of the neck, such as branchial cysts and fistula, thyroglossal cysts and fistula and lesions of the salivary glands. The colour illustrations of lesions of the tympanic membrane are improved. The old terminology 'catarrh of the Eustachian tube' is replaced by 'insufficiency of the Eustachian tube'. The use of grommet tubes in the treatment of chronic Eustachian insufficiency and secretory otitis media is now included. ACTH is strongly advised in the treatment of Bell's palsy. A good synopsis of chemo-therapy of cancer is given.

The ninth edition should continue to be popular with students, house surgeons and general practitioners. J.K.H.

THE WORK OF A FAMILY DOCTOR. By R. M. McGregor, O.B.E., T.D., M.B., Ch.B. (Pp. ix+ 266. 45s). Edinburgh and London: E. & S. Livingstone, 1969.

THE author of this book, a general practitioner of many years' experience, categorizes in detail the main diseases met in his general practice and during the eleven and a half years 1948–1960. He explains his methods of collecting his practice statistics to ensure accuracy. A discussion about the statistics of each disease contains references to particular cases the author has found to be of special interest and in these discussions therapeutic advice is given.

This book would be of value for reference purposes as it is an accurate record of the work of the practice. Its length could possibly be reduced without detracting from its value. The therapeutic advice offered may not be suitable for every reader, but contains material which would stimulate a reader to examine his own therapeutic efforts. The price of 45s. for the book appears to be a little excessive.

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THE VERY FACULTIES: A short history of the Development of Opthalmological and Otorhinolaryngological Services in Belfast (1801–1964) with special reference to the Belfast General Hospital, Ophthalmic Hospital, Great Victoria Street, Benn Ulster Eye, Ear, Nose and Throat Hospital. By R. S. Allison, V.R.D., M.D., F.R.C.P., D.P.M. (Pp. xiii+114; figs. 18). Belfast: Belfast Hospital Management Committee, 1969.

IN all hospitals, due to the rapidly changing personnel, a new addition is soon absorbed into the general structure of the building and what was there before is soon forgotten. The new Eye and Ear Clinic at the Royal Victoria Hospital is now recognised as one of the best of its kind in the three Kingdoms. Dr. R. S. Allison, V.R.D., M.D., F.R.C.P., in "The Very Faculties", traces the origin, the progress and the problems of the three small constituent units – in the Benn Hospital, Clifton, in the Ophthalmic Hospital, Great Victoria Street, and in the Eye and Ear Unit in the Belfast General Hospital, later Royal Victoria Hosptial – until they were all three amalgamated into this one new department.

Dr. Allison has covered the field in a way that will delight all medical historians. In Belfast, with Dr. Malcolm, Dr. Marshall, Dr. Strain and Dr. Calwell, we have been more fortunate than many other cities. This book points out how much we have benefited from the generosity and business ability of our wealthy principal citizens – The Benns, The Dixons, The Barbours, The Clarks. A delightful sketch is given of the leading medical figures of that time, on whose shoulders "these faculties" were raised to their present level. We can see Dr. Allison's own personality, with its love of the sea and adventure, instinctively drawn to men like Dr. Samuel Browne, who after long service in the Royal Navy became our leading eye specialist, later to become Mayor of Belfast. He in turn was followed by another adventurous spirit, Dr. Nelson, who fought with Garribaldi through the Sicilian Campaign but after that spent fifteen years in India as a tea planter before coming back to Belfast to amass the largest consultant practice of that time.

On the purely scientific side we must admire MacKeown (1874) who had an international reputation for his operation for removal of the immature cataract: for the use of the electromagnet for the removal of metal fragments in the eye (so useful in our heavy steel industry in Belfast): for his suggestion of a plastic substance (collodion) to make an artificial eardrum: for his courage to approach the oesophagus through an incision in the neck. He was a man well in advance of his time. He appreciated the value of the day-room for up patients – a facility still missing in many places. He insisted on an antiseptic chamber for operations, as suggested in New York – the forerunner of the modern aseptic operating theatre.

Dr. Allison regrets the changing face of the visiting consultants – the frock coat, the tall hat – he describes Sir John Walton Browne as being "The Last of the Dandies". This book is not solely the history of progress in disease of the eye and ear, nose and throat, but it covers part of the early history of the medical school of Belfast. It is a first class production, delightfully written, with a mass of detail. It is not only a book of reference but a book to enjoy. It gives us a foretaste of another book soon to be in the hands of the printers, when Dr. Allison will fill in the period 1850–1900 completing the trilogy of Malcolm, Allison and Marshall on the history of the Belfast General Hospital.

The Belfast Medical School should be most grateful that our archivist has found time to give us this valuable and delightful book. I.F.