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THE ULSTER MEDICAL JOURNAL

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THE ULSTER MEDICAL SOCIETY

CONTENTS

There are two supplements.

SYMPOSIUM ON RENAL DIALYSIS AND TRANSPLANTATION.
(This has been made possible by the Northern Ireland Kidney Research Fund).

THE BELFAST MEDICAL SCHOOL AND ITS SURGEONS: Sir Ian Fraser.
(Sponsored by Messrs Smith Kline and French Laboratories).

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THE
ULSTER MEDICAL JOURNAL

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VOLUME 50 1981 No. 1

THE KISSING VIRUS

by

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PRESIDENTIAL ADDRESS TO ULSTER MEDICAL SOCIETY
SESSION 1980-81

THE Epstein-Barr virus, also called "The Kissing Virus", is perhaps the commonest of all viruses that infect human beings. It usually causes no ill-effects whatsoever, but it does cause glandular fever or infectious mononucleosis, and there is substantial evidence linking it with two human cancers, not usually found in this part of the world. It was discovered through the co-operation of surgeons, physicians and pathologists and is involved in many branches of medicine. In recent years it has been implicated in a wide variety of clinical conditions.

This virus belongs to the Herpesvirus Group, and while each member of the group has absolutely similar appearance when examined by the electron microscope, each is distinguishable by the different disease or diseases which it causes and by the different antibodies which it produces. For instance, herpes simplex causes cold sores, varicella zoster causes chicken pox and shingles, and cytomegalovirus causes both congenital infection and infection in renal transplant patients. Epstein-Barr (EB) virus causes glandular fever, an acute and self limited disease usually in young adults, which is associated with severe fatigue and which can last for up to six weeks. The main symptoms are skin rash, pharyngitis, tonsillitis, enlarged lymph glands and enlarged spleen, and the peak incidence of the illness is around twenty years of age. Convalescence can be prolonged, and relapses and complications are both rare. Diagnosis is made clinically and by examination of the blood, which initially shows a diminished number of white blood cells, followed by a striking increase in their number with a large proportion of mononuclear cells, some of which are atypical

lymphocytes. These cells have a hyperbasophilic and vacuolated cytoplasm, and kidney shaped nuclei. A serological test, the Paul-Bunnell-Davidsohn or heterophil antibody test is usually positive, though false positive reactions do occur. Foolproof diagnosis can now be made by showing certain specific antibodies to EB virus, and these will be discussed later.

THE ASSOCIATED CANCERS

The two human cancers closely associated with EB virus are Burkitt's lymphoma and nasopharyngeal carcinoma; the virus was originally found in the former. Mr. Dennis Burkitt, an Ulsterman and a surgeon, working in Uganda, recognised a jaw tumour commonly occurring in youngsters, with a peak incidence around five to seven years of age, and in investigating this he undertook many landrover "Tumour Safaris" in Uganda and throughout Africa, and made many exciting observations. He first reported his pioneer work in the Middlesex Hospital Medical School in London in 1961.[1] There is a restricted geographical distribution of these tumours with clusters of cases in the area of Africa where malaria is endemic. Sporadic cases occur in other parts of the world. The histopathology of this lymphoma has a "starry sky" pattern, due to the large pale macrophages with their abundant cytoplasm, and the much smaller, closely packed tumour cells, which are B lymphocytes.

Nasopharyngeal carcinoma occurs primarily in the posterior and lateral walls of the nasopharynx. With this cancer there is also a restricted geographical distribution, with a very high incidence in some populations of Chinese descent. In the very high risk area around Singapore there is a particularly high incidence in the Cantonese Chinese; this also appears in these Cantonese people who have emigrated to San Francisco and Hawaii. On the other hand, there is a lower incidence in a number of countries around the Mediterranean and in East Africa. The peak age of the cancer is between 45 and 55 years, with males being affected about three times more than females, and in Tunisia there is an additional age peak of frequency at between ten and twenty years.

THE VIRUS AND ITS DISCOVERY

Dr. Tony Epstein, a pathologist, at the Middlesex Hospital, became interested in Burkitt's lymphoma, and in 1964 he and Yvonne Barr, a Dublin Graduate, cultured cells from tumour material flown from Uganda. Shortly after with Dr. Achong, another Dublin graduate, they first discovered the virus itself by electron microscopic examination of the cultured cells. This explains how the virus got its name—the Epstein-Barr virus.

The virus is divided into three main parts, a central core, a capsid and an envelope.[2] The central core, consists of viral DNA. The capsid, which is icosohedral in shape, consists of hollow tubular protein sub-units called capsomeres, which are the "building blocks" which give the virus its shape. The virus acquires its outer protective coat, or "envelope" from part of the cell in which it grows. All three parts can be seen microscopically.

While all the other herpesviruses have similar appearance and grow easily in tissue culture cells used conventionally, EB virus behaves very differently in the laboratory and is more difficult to propagate.

METHODS OF STUDYING THE VIRUS

Three main methods are used in the study of this virus. *First,* cells from African Burkitt's lymphoma, the B lymphocytes which carry EB virus, can be grown and cell cultures derived from these have been used in laboratories all over the world as standard sources of virus. *Secondly,* certain white blood cells, in our circulation, the B lymphocytes, whose main function is the production of antibody, can be infected with EB virus. For example, if we take throat washings from a patient with glandular fever which contain a lot of virus at the acute stage of illness and mix these washings up with B lymphocytes, the virus will stick to these cells which possess the appropriate receptors. The protein coat of the virus will be shed and the viral DNA will be incorporated into the nucleic acid of the B lymphocytes, which will become "transformed". When this event takes place the cells will proliferate indefinitely provided they are suitably fed, and we say they are "immortalized". At this stage each cell contains in its nucleus EB virus nuclear antigen, known as EBNA. Thus, we use our second method of artifically infecting B lymphocytes either to find out if an individual is excreting virus, or to measure the amount of virus we are using in our laboratory tests. In the *third* method of studying the virus, we estimate the amount of antibody, and in infections with this particular virus we get maximal information about the illness if we look for and measure antibody to the different viral antigens. We do this by means of the immunofluorescent technique, using as antigen in our tests suitable preparations of standard Burkitt lymphoma cultured cells showing each particular antigen. Approximately 10 per cent of the cells of the producer cell line, P_3HRI, show capsid antigen, while 100 per cent of the nuclei of the non-producer line, Raji, contain EBNA. Early antigen is obtained by superinfecting Raji cells with enveloped virus prepared from cultured P_3HRI cells, and the two types, restricted and diffuse, are obtained by using different fixatives.

We use our antibody tests to determine whether or not individuals have previously been infected with the virus. The easiest way is to test sera for the presence or absence of antibody to the viral capsid. While EB virus is extremely common, serological surveys have shown that primary infection takes place at different ages in different communities. Most infants in all communities inherit maternal antibody, which declines rapidly after birth. In East Africa, where Burkitt's lymphoma is found, by two years of age almost 100 per cent of infants have produced their own antibody to EB virus as proof of early primary infection. By contrast, in the United States of America 80 per cent of individuals of a high socio-economic level have developed antibody only by seventeen years of age. In both these immune groups, immunity has been acquired by a "silent" or asymptomatic infection. The 20 per cent who are susceptible in the second group are likely to become infected later, and about half of those infected experience the clinical illness, glandular fever.

SPECTRA OF ANTIBODIES IN DIFFERENT SITUATIONS

The susceptible individual does not have antibody to any of the different antigens, while the immune individual has antibody in immunoglobulin class G to viral capsid and also antibody to EBNA. At an early stage of primary infection in childhood, such as occurs in Uganda, antibody to virus capsid is present in both IgG and IgM classes, and there is antibody to one component of the early antigen complex, the restricted component. In glandular fever, again there is antibody to virus capsid in

both IgG and IgM classes, but the antibody to early antigen is directed against the diffuse component. Antibody to EBNA develops slowly, while heterophil antibody is present at an early stage. Very distinctive and different spectra of antibodies exist in both Burkitt's lymphoma and nasopharyngeal carcinoma. In both conditions antibodies to capsid antigen in IgG class and EBNA are of high titre, but heterophil antibody is absent; in Burkitt's lymphoma there is antibody to the restricted component of the early antigen, while in nasopharyngeal carcinoma the antibody is to the diffuse component, and antibody to this antigen and to the capsid antigen are found also in IgA class. Heterophil antibody is not present in either of these conditions.[3]

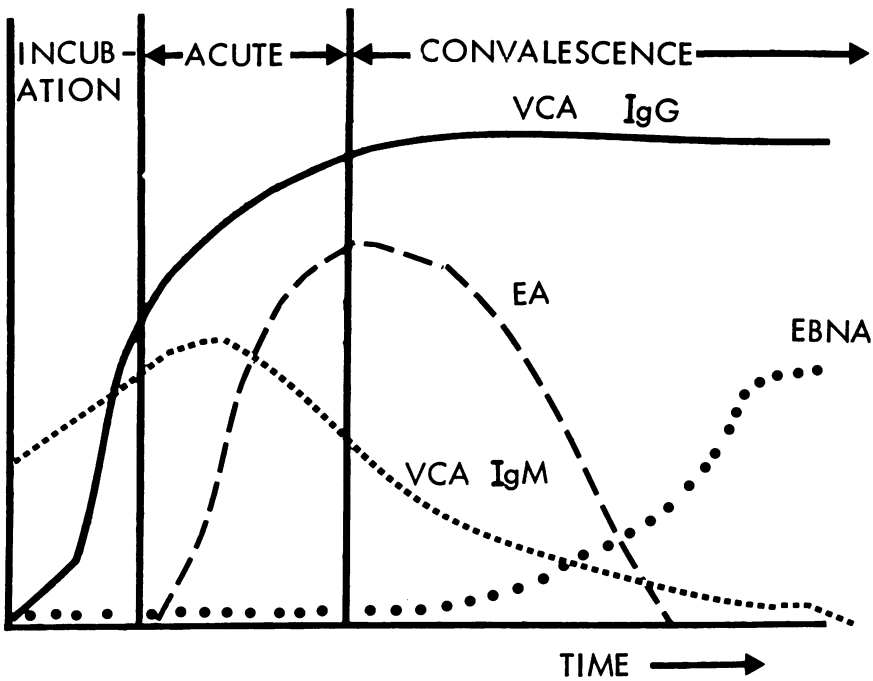

Figure *EB virus antibody response during the course of glandular fever.*
VCA = *Virus capsid antigen.*
EA = *Early antigen.*
EBNA = *Epstein-Barr nuclear antigen.*

The figure shows the sequence of the appearance of antibodies to the different antigens of EB virus in glandular fever, and it is obvious that the transitory antibody to early antigen and the transitory antibody to capsid antigen in IgM class are indicative of active early infection. From the above observations, it is evident how important detection and measurement of the different antibodies can be in diagnosis.

PROOF THAT EPSTEIN-BARR VIRUS CAUSES GLANDULAR FEVER

Drs. Gertrude and Werner Henle in Philadelphia showed conclusively that EB virus causes glandular fever and they did so when they were testing very many sera in

an attempt to unravel the mystery of the virus found in Burkitt's lymphoma. By a quite extraordinary coincidence a junior laboratory technician developed glandular fever and they found that her serum, frozen away in the laboratory some time before her illness, had no antibodies, while these appeared in her serum during and after her illness. Confirmation in a large number of patients was possible because stored samples of serum from Yale University students were available as part of a prospective clinical and laboratory study of glandular fever. Also, it was shown that virus was freely shed from the throat during illness.

Regarding transmission of the virus, interesting studies have shown that a large and direct inoculum of virus is needed to transmit the disease—indeed, intimate oral contact labelled the virus "The Kissing Virus". The illness is characteristically associated with kissing in young adults and affects the more susceptible upper socio-economic classes. Indeed, a peak incidence in late winter, four-six weeks after Christmas, with probable increased intimate exposure to virus-containing saliva at that time has been reported.

This is well illustrated from an article by Dr. Robert J. Hoagland in the American Journal of Medical Sciences, 1955.[4] I quote: "One of my patients with infectious mononucleosis stated that on December 23, 1950, he was in a train and spent about twelve hours in the company of a female medical student whom he had never seen before and whom he never saw again, but with whom he corresponded. These two individuals kissed frequently and, more important, in a way to allow mingling of saliva . . . The patient learned, by letter, from his train acquaintance, that she was a patient in a university hospital with a disease diagnosed as infectious mononucleosis". This story speaks for itself.

RELATIONSHIP OF EPSTEIN-BARR VIRUS TO BURKITT'S LYMPHOMA AND NASOPHARYNGEAL CARCINOMA

Extensive and difficult investigations have not proved conclusively that Epstein-Barr virus is the sole cause of Burkitt's lymphoma and nasopharyngeal carcinoma.

First I shall discuss findings in relation to the 98 per cent of cases of Burkitt's lymphoma which contain virus and which occur in the high incidence area in Africa. The proof of the virus association in endemic Burkitt's lymphoma is—*firstly,* that there is a very "special" spectrum of antibodies of a very high titre, and the antibody to the early antigen complex points to active ongoing viral activity. *Secondly,* after surgery or chemotherapy, a drop in antibody indicates a favourable prognosis, whereas a rise in antibody points to tumour recurrences. *Thirdly,* cells from the tumour can be grown in culture outside the body and are what we call monoclonal: that is, growth occurs from the multiplication of a single cell. *Fourthly,* the virus from the tumour itself has the ability to "transform" B lymphocytes and the molecular biologists have been able to show us that Epstein-Barr virus DNA is in each tumour cell, as well as EBNA. When the tumour cells are injected into New World monkeys they cause tumours.

A rather similar set of findings occurs in nasopharyngeal carcinoma. There is a distinctive pattern of antibodies of high titre—with specific antibody in immunoglobulin class A—probably locally stimulated in the pharynx. Further, a rise in antibody has been shown to be associated with increased tumour size and with

secondaries—a fall occurs with successful treatment. Viral DNA and EBNA have been shown in the epithelial carcinomatous cells in all classical cases of nasopharyngeal carcinoma, and while these cells have not been cultured outside the body, it has been possible to transform B lymphocytes with virus particles from the tumours.

In summary, very high levels of antibody to EB virus occur in both Burkitt's lymphoma and nasopharyngeal carcinoma, multiple copies of viral DNA occur in both tumours and in the case of Burkitt's lymphoma whose cells can be cultured, the tumour is monoclonal. Distinct differences exist between the cultured cells of Burkitt's lymphoma and cultured B lymphocytes from healthy individuals previously infected with EB virus, whose cells will grow due to reactivation of latent virus. In Burkitt's lymphoma the tumour cells are monoclonal, while cultured cells from a healthy person are polyclonal, several clones of cells having multiplied. The lymphoma cells are aneuploid with the chromosomal marker $14q^+$, while the healthy cells are diploid and do not possess a special chromosomal marker. The lymphoma cells have the ability to induce tumours when injected into certain monkeys, while the healthy cells will not. There are different surface glycoproteins on the two cell types.[5]

While Burkitt's lymphoma is a monoclonal tumour with Epstein-Barr virus in every cell indicating that the original B lymphocyte undergoing malignant transformation must have been infected at the outset, nasopharyngeal carcinoma is the proliferation of a clone of carcinomatous epithelial cells, containing EB virus. In both conditions the serological profile is consistent with patients carrying a heavy load of the virus.

But it is difficult to reconcile the ubiquitous presence of the virus with the rarity of these tumours. A prospective study of sera from 42,000 children in Uganda showed that normal patterns of antibody to EB virus were present long before the development of the tumour; in other words the children had their primary viral infection before the tumour began to grow.[6] It has been argued that malaria is the crucial co-factor which triggers off the malignancy, and a clear parallel has been shown between a high incidence of Burkitt's lymphoma, a high level of malarial infection and, to a lesser degree, high temperature and high rainfall. Evidence points to the EB virus infecting infants in the neo-natal period when the lymphocytes and indeed the entire immune system is immature, while heavy malarial burden and possibly other environmental and host factors are also involved in the pathogenesis of Burkitt's lymphoma. The fact that malaria infection has recently been shown to stimulate the growth and proliferation of B lymphocytes, and also to suppress T lymphocytes, the regulatory cells which control the immune responses of the body,[7] supports the view that environmental factors are closely implicated.

In areas where nasopharyngeal carcinoma occurs it has been shown that primary EB virus infection also occurs very early in life, and again the long interval between virus infection and tumour development suggest participation of co-factors. In South East Asia persons affected are usually over 40 years. Multiple cases, with a preponderance in males, occur in Chinese families through several generations, and a certain histocompatibility antigen has been found in high frequency in these Asian cases. Indeed this antigen appears to be a marker for a very high risk of developing nasopharyngeal carcinoma. This would point to the importance of genetic factors in the pathogenesis of this cancer, though there may also be environmental cases. For

instance, consumption by Cantonese Chinese of salted fish, known to contain a carcinogenic compound, may precipitate the cancer.

Thus, there is strong evidence that EB virus is a causative factor in these two human cancers. Professor Epstein believes that the perfecting of a preventative vaccine, and its subsequent use, will give the final answer as to whether or not EB virus is a cause in both of the conditions. Regarding Burkitt's lymphoma—many pin their faith in the successful eradication of malaria, to eliminate the tumour.

What are we to say about *anti-viral drugs* in this respect? Undoubtedly the new anti-viral agent Acyclovir or acycloguanosine,[8] has attracted much attention in relation to the herpesvirus group. Clinicians have been most enthusiastic in its preliminary use, for instance in shingles in immunosuppressed patients, in whom it is being carefully evaluated. However, it has been shown that EB virus is only very slightly sensitive to this drug, so it looks as if we will have to wait for another anti-viral drug to turn up to cope with this virus.

IMMUNOLOGICAL ASPECTS OF EPSTEIN-BARR VIRUS INFECTION

Immunologists have learnt a lot about how the immune system works by examining both antibodies to EB virus, and also the reactions of the cells of the immune system, both in patients with infectious mononucleosis, and also in patients with a wide variety of disorders of the immune system.

In a healthy immune person, neutralising antibodies will block any further infecting virus from infecting a B lymphocyte. If a virus does pass this block and infect such a cell, suppressor T lymphocytes will prevent the B lymphocyte from transforming. If any B lymphocyte does transform, it will be prevented from proliferating by further suppression by T lymphocytes.

However, if a susceptible adult does become infected, these first three mechanisms may be insufficient to stop proliferation of the B cells, now EBNA—positive from growing; therefore the more powerful killer T cells come into play. This is what happens in infectious mononucleosis. Indeed the majority of the atypical lymphocytes in the blood of patients with infectious mononucleosis are T cells of different types—some are probably cytotoxic, some are suppressor, and others are immature T cells.[9] George Klein describes infectious mononucleosis as a "Civil War" between a small number of virus-transformed cells, and a large number of T cells.[10] Most primary infections are not manifested as infectious mononucleosis —in children and in subclinical infection, infection is controlled without the large scale T cell response, seen in infectious mononucleosis.

The patient recovers after infection and the virus establishes itself in a persistent carrier state. When the lymphocytes are cultured the virus can be recovered indefinitely, and in addition the virus is shed intermittently into the saliva. However, in immunosuppressed patients, such as patients following renal transplant, virus is shed much more freely.[11] One immunosuppressive agent, Cyclosporin A, has been shown to inhibit the controlling effect of the T cells, and thus causes B cell lymphomas containing EB virus.[12] Such lymphomas and also widespread growth of virus have been found in rare instances where there is a loss of immunoregulatory control, or a cytogenetic defect in B cells.[13]

Raised antibody titres to EB virus have been found in disease like sarcoidosis and systemic lupus erythematosus,[14] which have in themselves an immunosuppressive effect, and it is well documented that those Hodgkin's disease patients, who have very high levels of antibody to EB virus,[15] have depressed cell mediated immunity, or lack of control of antibody production due to failure of suppressor T cells. Recent findings in this and in other situations have prompted the suggestion that "patterns" of antibody to EB virus might be a more sensitive measure of defective cell mediated immunity than more conventional tests of immune function.[16]

SUMMARY

I have given a panoramic view of the EB virus and the diseases associated with it. On the one hand the virus has been shown to cause the infectious disease, infectious mononucleosis—on the other hand it has been shown to be closely associated with two human cancers of two distinct cell types, B lymphocytes in Burkitt's lymphoma, and epithelial cells in nasopharyngeal carcinoma. This virus persists harmlessly in the vast majority of individuals. However, it is now recognised that undesired effects of the virus are connected with alterations of the immune system; some of these have a genetic origin, and some result from immunosuppressive therapy now frequently employed. Therefore I believe firmly that this virus has to be reckoned with, and indeed has to be considered as a candidate virus which may be involved in pathogenesis in a wide variety of diseases of unknown aetiology.

The remarkable story of this virus will continue, and we can understand Roizman's comment: "Not since the heyday of poliomyelitis research has a single agent attracted so much interest as Epstein-Barr virus".[17]

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JOHN CREERY FERGUSON
1802-1865
Physician and Fetologist

by

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Read to the Ulster Medical Society on 8 January, 1981

THE great obstetricians of the 18th century did much to reduce the suffering of women in pregnancy and childbirth. It is all the more remarkable that in their copious writings on the care of expectant mothers the condition of the fetus is rarely mentioned and played little or no part in determining the management of women in childbirth. The reason for this however is quite clear: apart from noting such unequivocal evidence of fetal death and decomposition as a foul smelling vaginal discharge, there was no reliable method in those days of assessing the vitality of the unborn infant. Auscultation upon which our knowledge of fetal well-being still largely relies today did not become a practical proposition until after Laennec had invented the stethoscope and perfected the technique of mediate auscultation in the second decade of the last century.

Immediate auscultation that is with the ear applied directly to the patient had apparently been tried early in the history of medicine. There is a single and as it happens, erroneous observation in the Hippocratic Treatise "Concerning Diseases" where we read: "You shall know that the chest contains water and not pus, if on applying the ear for a time to the patient's side you perceive a noise like boiling vinegar".[1]

I have myself been unable to find any subsequent direct mention of immediate auscultation as such in the Hippocratic Corpus or anywhere else until Laennec's time and although I have read[2] of a mediaeval Flemish engraving showing a physician applying his ear to the chest wall I have not so far been able to find it.

Laennec[1] like others before him had found immediate or direct auscultation "as uncomfortable for the doctor as it was for the patient, disgust in itself making it impracticable in hospitals and hardly suitable where most women were concerned". The stethoscope solved these problems by making direct contact with the patient unnecessary.

Now the invention of the stethoscope was on this wise; Laennec tells how he was "consulted in 1816 by a young lady who presented the general symptoms of heart disease and with whom the application of the hand and percussion gave poor results owing to stoutness. The age and sex of the patient forbidding direct auscultation "I remembered" he continues "a well known phenomenon of acoustics: If the ear is applied to one end of a beam a pin prick is most distinctly heard at the other end". This is said to have first occurred to him when on his way to visit this particular

patient he saw some boys playing in the courtyard of the Louvre; one had his ear at the end of a beam, whilst his playmates struck the other. He goes on "I took some sheets of paper and rolling them very tightly I applied one end to the precordial region and placing my ear at the other end I was as surprized as I was gratified to hear the beating of the heart much more clearly and distinctly than if I applied my ear directly to the chest". Thus began the train of events that led to the invention of the stethoscope.

Assisted by his friends Laennec experimented with different materials, first as solid and then as hollow cylinders. In turn he tried ebony, cedar wood, malacca cane, lime wood, glass, paper, leather and various metals; he even tried an old oboe belonging to his cousin.

Eventually he settled on a cylinder of light beech wood about a foot long, pierced through the centre with 2 adjustable parts, cupped at their extremities. This was the design of the instrument that was distributed by Laennec's publishers along with his book in 1819 and it was with a cylinder of this type that the fetal heart was heard first in Paris and later as we shall see in Dublin. The instrument underwent rapid and varied morphological changes in the succeeding years but by 1827 the monaural stethoscope as designed by Piorry[3] closely resembled the fetal stethoscope we use today. Nevertheless even in Austin Flint's time in the 1850's solid wooden cylinders were still being used.[4] The binaural stethoscope the aural ends of which fit accurately into the external auditory meatus rather than around the ear appeared somewhere in the late 1850's. The use of an intra-aural nipple had been suggested in 1833 by Hohl but never caught on and the stethoscope designed by Depaul[5] in 1836 was substantially identical with the fetal stethoscope of today although the material now used is usually plastic.

A variety of names were proposed for the new instrument, cornet, baton, cylinder, medical pectoriloquy, solameter and thoracoscope were all suggested but were all rejected by Laennec in favour of stethoscope from the Greek: *stethos*—the chest and *scopein*—to observe.

Writing to his uncle about his invention he said "it really is a lucky find. It is a pity that it has not fallen to certain people who would have known how to make money out of it; . . . I am a fool in such matters and all I expect . . . is a bit of short-lived praise; which I will have the disadvantage of recognizing at its true value". In the event his cynicism was happily ill-founded and his invention won him even during his tragically short lifetime a lasting place amongst the benefactors of mankind. For in 1825 the year before Laennec's untimely death from pulmonary tuberculosis at the age of 45, young William Stokes[6] could write of him as "this great man whose work will remain an everlasting monument to whom it is almost presumption to offer anything like praise"; an echo of Aristotle's famous eulogy on Plato of whom he said "it is blasphemy in the base even to praise". Certainly Laenenc's new invention resulted in remarkable and rapid advances in the study not only of the lungs and heart but of the fetus in utero also. The first Edition in 1819 of the Treatise on Mediate Auscultation made no mention of the fetal heart but the second published in 1826 carried in an appendix[7] a full description of the auscultatory signs of pregnancy. This was the work of Jacques Alexandre le Jumeau de Kergaradec, Laennec's friend and fellow Breton to whom the great man gave full credit for "he had not" he tells us "himself thought of applying auscultation to the

study of pregnancy. This happy idea is due to my compatriot and friend M. le Docteur de Kergaradec".

Kergaradec's work like Laennec's was either ignored or ridiculed by many contemporary French doctors; one elderly obstetrician publically inveighed against the stethoscope[8] as "a new fangled and ridiculous plaything" and strongly advised Kergaradec to "abandon these toys of ignorance, truly prejudicial to science and the well-being of an amiable and interesting sex".

Throughout the British Isles also the instrument was at first either ignored or treated with suspicion by the medical profession in general. But luckily there were as always men ahead of their time with the foresight to realize the potential of the new instrument. Amongst these was the young Irishman William Stokes who began to study the uses of the stethoscope in 1825 whilst still an undergraduate in Edinburgh. His enthusiasm knew no bounds; after only three months experience with the instrument (such is the fervour of youth—he was 21 at the time) he wrote an "Introduction to the Use of the Stethoscope" and succeeded in having it published that same year. What is more it did very well, not only bringing him an early reputation as a high flyer but also £70 from his publishers a large sum in those days for a small book by a young and unknown author; Robbie Burns when already well-known in Scotland got only £50 for the Edinburgh Edition of his poems. Stokes pleaded with the profession not to judge the new method with its eyes shut. "Mediate auscultation" he wrote "like truth, does not shrink from enquiry but on the contrary courts investigation. Our advocates only demand a fair trial". In Great Britain such a trial was not to be readily vouchsafed. John Burns although first Regius Professor of Surgery in Glasgow was better known as an expert accoucheur and author of a very successful Textbook of Midwifery. In its Seventh Edition published in 1828 nine years after Laennec's invention became public property Burns makes little mention of it merely noting that "with the stethoscope it is supposed by some that the pulsations of the child's heart may be heard" adding sarcastically "but not I presume by ordinary ears".

Five years later when fetal auscultation was being used successfully in Dublin and Edinburgh a Dr. William Johnstone[9] of that City to whom the medical uses of the stethoscope had been recommended by our own Dr. James McDonnell felt obliged to declare that he held "the evidence of the pulsations of the fetal heart through the abdominal parieties of the mother extremely equivocal". Over-conservative and ill-informed attitudes of this sort provoked the exasperated retort from Dublin[10] that anyone who could not hear the fetal heart was either deaf or not really trying "for there are none so deaf as those that will not hear!"

In Dublin things were otherwise. Stokes continued to use the instrument with enthusiasm after his return to his native city. And in the Rotunda where Dr. Collins was Master, by 1830 the stethoscope was being used almost daily to detect the fetal heart.[11] Evory Kennedy was assistant to Collins and in 1833 succeeded him as Master. He was a Donegal man. His long life—he lived to be 80—was full of activity, in and out of medicine. In 1839 as he approached the end of his Mastership of the Rotunda he applied for the vacant Chair of Obstetrics and Gynaecology in Edinburgh and was very nearly successful. James Young Simpson only defeated him by a single vote! Later he turned his attention to politics and unsuccessfully contested the parliamentary seat for Derry. John Stanwych Drennan was the son of the

physician poet and patriot William Drennan who as penman for the United Irishmen narrowly escaped hanging for sedition in 1794. Though less distinguished than his famous father J.S. Drennan was a man of considerable stature in his own right. Dr. Sidney Allison[12] in the Seeds of Time hails him as "an outstanding physician on the staff of the Belfast Royal Hospital . . . who left his imprint both on the hospital and the medical school at Queen's". It would appear that he inherited some of his father's gift for expression in prose and verse for on the occasion of Kennedy's excursion into national politics Drennan delivered himself of the following jingle.[13]

"An accoucheur for Derry? Shame and pity
What a reflection on the maiden city!
Rejoice old walls ye prentice boys be merry
Another great deliverer for Derry".

To which came the retort

"Remembering King William's fame
A Deliverer surely has a claim!"

But to return to Evory Kennedy. He published his experiences of fetal auscultation in 1833.[14] His original, accurate and comprehensive little book on the obstetric uses of the stethoscope was to make him a foremost figure in European obstetrics and significantly influenced Scottish and much later, English obstetric thought and practice as far as fetal well-being was concerned.

However, Evory kennedy was not first in this field in Dublin. One November evening in the year 1829 a promising young physician read a paper to the Association of Fellows and Licentiates of the King's and Queen's College of Physicians in Ireland.[15] He described how with his colleagues, Hunt and Corrigan—Corrigan of the pulse whose centenary we celebrated last year—he had been about to perform an experimental laparotomy on a female goat when he casually applied his stethoscope to the beast's abdomen. He was astonished to hear the distinct double pulsations of a fetal heart. He had become familiar with this characteristic rhythm when as a medical student he had visited Paris where Laennec and Kergaradec had introduced him to the auscultation of the pregnant human abdomen and convinced him of the importance of fetal auscultation. He tells how Hunt and Corrigan were also satisfied perfectly of the fact and how their observation was presently confirmed by the extraction at laparotomy of a 7-week goat fetus "of which the minute preparation then passed round the meeting was the heart no larger than a walnut". But this was not the first time the mammalian fetal heart had been heard in Dublin for this same young man two years previously in November 1827, and soon after he qualified at Trinity, had heard with a Laennec stethoscope at the Dublin General Dispensary, for the first time in these British Islands, the human fetal heart.

This young man's name was John Creery Ferguson. His background was quite different from his friend's, William Stokes; whereas Stokes was the son of a famous father and grew up in Dublin with every opportunity to develop and make use of his undoubted talents, Ferguson's father started his professional career as an obscure apothecary in Tandragee in Co. Armagh where his father-in-law was the incumbent of the Church of Ireland Parish of St. Mark. Situated on top of a hill, exposed to the prevailing South West winds, it is a draughty place in Winter. This is reflected in the Irish, from which according to Joyce,[16] its name is derived, for Tonlegaith or

Tonregee or Tandragee literally means "backside to the wind". Ferguson did not however also have the metaphorical wind behind him at least not to the same extent as his friend Stokes; nevertheless he made excellent use of what there was. The family had moved to Dublin and young Ferguson went to that remarkable school, the Feinaiglian Institution.[17] This was founded in Dublin in 1813 by one Gregorius Feinaigle, a former Cistercian father in the secularised Monastery of Salem in the Archdiocese of Freiburg. This religious house, with others, was suppressed early in the 19th century because of the political conditions then obtaining in central Europe after the Napoleonic wars.

Father or Professor Feinaigle as he came to be known emigrated to Dublin where he expounded a system of education based on what he called the new system of mnemonics and methodics. It was not however original as it was based on the concept of the 'topical memory' described by Cicero and Quintillian and certainly previously used in Germany as recently as the 17th century. It employed methods similar to those of Pelmanism and so successful were Professor Feinaigle and his staff that young Ferguson not only obtained an Entrance Scholarship to Trinity but was placed first in the examination and won the gold medal. He studied medicine at Trinity from 1813 to 1823, and then as was customary for those who could afford it, spent two years abroad—one in Edinburgh and one in Paris—before returning in 1827 to Dublin where he graduated MB once more in the first place, once more with the gold medal.

On his way to Edinburgh in the Winter of 1824 he was accompanied by his friend William Stokes who was returning to Scotland. His father Professor Whitley Stokes had become a non-conformist and had to resign his fellowship at Trinity so young William had to go to Scotland to study medicine first at Glasgow and then at Edinburgh.[18]

Their journey to Edinburgh is described in a manuscript diary that Ferguson[19] kept at that time and for access to which I am indebted to the Public Records Department. Like the Magi, "a cold coming they had of it, just the worst time of the year for a journey". By coach from Dublin they arrived in Belfast on Saturday October, 30th "Half past nine p.m. found us safely at Linn's Hotel". This was the White Cross Inn run by Patrick Linn at No. 1 Castle Street. The wind was rising from the North West and towards evening a fine rain had begun to fall. The two friends supped off oysters (Carrickfergus oysters were famous for their flavour and their prodigious size) and then went straight to bed; on a wet Belfast Saturday night in 1824, "where else" asks young Ferguson plaintively "would we go?". Their crossing to Glasgow on the Steamboat Eclipse was a rough one for it was now blowing hard. Most of the passengers were very sea-sick. The bad weather persisted as they made their way up the Clyde to Glasgow which they found wet and dreary.

Thursday, the day after their arrival was a fast day, kept "as religiously as any Sunday. No business whatever transacted in the town". On Sunday they went to the St. Enoch's Kirk "a grand old building, Gothic in the same style as St. Patrick's but much more magnificent . . . The congregation immense; it was Sacrament Sunday; they have only two in the year. Dr. McPharlan preached an hour and a quarter . . . " afterwards they ran home through heavy rain". How they must have longed for perhaps dirty but relatively dry and easy-going Dublin. Conditions did not improve and they set off without regret for Edinburgh through continuing bad weather in

heavy coach dragged by "wretched cattle". The horses were changed four times and each time a coachman was to pay. "they only drive 10 miles the rascals".

In Edinburgh Ferguson continued to find the Scottish Calvinistic Sunday particularly trying. An entry for Sunday 14 November reads "Never left the house. Why? Day remarkably fine, vast numbers of people walking the streets between services but at others one would imagine that plague has infested the town".

He stayed for the best part of a year in Edinburgh but was disappointed in the Medical School which at that time had fallen from the pinnacle it had occupied in European medicine in the latter part of the 18th century. He is particularly hard on the Edinburgh Infirmary which he regarded as "so very inferior in every respect but particularly as a school to all our Dublin Hospitals that it needs no remark. Suffice is to say that students to the number of 295 fight and jostle with each other round the patient to have even a view of him or her".

This is reminiscent of the teeming medical schools of Egypt today; that it was no exaggeration is suggested by a comment by Robert Graves[18] who writes of the clinical clerking system used in Edinburgh at this time that "Two clinical clerks are selected, one for the male and one for the female wards. Their business is to write an accurate history of the case, report the effects of medicines and record the symptoms that may have occurred since the physician's last visit. At his daily visit the physician stops at the bed of each patient and interrogates him in a loud voice while the clerk repeats the patient's answer in a voice equally loud—this is done to enable the whole audience, many of whom barely caught a glimpse of the patient to understand what is going on".

Ferguson was not sorry to leave Scotland and had little good to say of the inhabitants whom he found, especially the young men, "not very attractive" with "none of the sauviter in modo, too often perhaps possessed by Pat!". He was much happier in Paris where he made the acquaintance of both Laennec and Kergaradec and learned to use the new stethoscope which like Stokes he adopted enthusiastically. In particular he tells how he often saw Laennec confirm the truth of Kergaradec's auscultatory signs of pregnancy and heard him acknowledge their value; after his return to Dublin he retained and developed his interest in the fetal heart. He strongly recommended the new instrument to his obstetric colleagues especially Collins the Master of the Rotunda.

Using, no doubt, Laennec's original type of stethoscope the beechwood cylinder, Ferguson assures us that he did not find it usually necessary to undress his patients or to oblige them to lie flat. His usual practice was "to examine them seated on a chair and without the removal of any part of their dress". Unlike the French and British obstetricians, Collins and his assistants, Evory Kennedy and O'Brien Adams having tried the method accepted it and it became routine practice in their wards in the early 1830's. Ferguson was thus more fortunate with his obstetric colleagues than Kergaradec had been.

At this time the Dublin Lying-in Hospital, the Rotunda as it was affectionately known was the largest in Europe except for Vienna affording relief to more than 2,000 women a year. Not all its institutions were universally admired. In an editorial in the London Medical and Surgical Journal[20] of 1831 we find the following "Its medical officers are a Master and two assistants, all physicians. It also has its

surgeons. The Master is elected every seven years and generally by interest—talent and merit are not recommendations. Nothing can be worse than the farcical mode of election. Physicians have been appointed Masters whose abilities are the most slender, whose names are unknown beyond the precinct of the Irish Capital and who in candid truth and justice have no claim whatever to appointment the consequences being that their lectures and principles are far below those of their contemporaries . . . In these remarks we do not forget the valuable papers of Doctors Beattie, Johnston, Breen, McKeever, Douglas, Ferguson and Kennedy but all these writers were assistants" (in fact Ferguson was not but let that pass) "all these were assistants what let us inquire has been done by the Masters?"

Reading this today we may also inquire what is the significance of the fact that the Editor of this outspoken Journal was called Michael Ryan. Alas at this distance in time we shall probably never know the hopes and fears, the disappointments and angers that boiled in the breasts of frustrated aspirants to the staff of the Rotunda and may have spilled over in this outspoken and vehement criticism of that establishment. But whatever would-be reformers may have felt about the administration of the Rotunda in general Dr. Collins, the Master from 1826-1833 perhaps because of his youth—he was then only in his late 20's—had the open-mindedness and foresight to encourage the use of the stethoscope in his wards and both his Assistant Masters used it. This was unique in the British Isles at that time.

Ferguson, like Kergaradec, was a physician and not an obstetrician. His main interest in the fetal heart was forensic and he regarded it a great desideratum to the practitioner who valued "not only his good name but his conscience to be able to pronounce with certainty not whether there be a fetus in utero but whether it be living. So situated the medical man may confidently turn to his stethoscope. It will afford him the evidence of his senses in proof of the presence of a living fetus by physical means, simple in their nature, unerring in their indications and possessing the great advantage of being quite inoffensive to female delicacy. I conceive . . . that as accurate and positive ideas of existences may be conveyed by the sense of hearing as that of sight; that the blind man who hears the fetal heart in utero is as morally certain as he who sees it after birth".

Ferguson's classic paper, the only one on the subject, appeared in 1830 in a short-lived Journal called the Dublin Medical Transactions, only one issue of which was published. It consisted of papers contributed by members of the association of fellows and licentiates of the King's and Queen's College of Physicians in Ireland. By great good luck, one of these was by Ferguson, read on November 3rd, 1829, and entitled "Auscultation the only unequivocal evidence of pregnancy, with cases". In this this he regretted that the stethoscope had not been used more often in obstetrics during the seven years that had passed since Kergaradec's classical description of obstetric auscultation. The first of the cases he describes is of great obstetric and historic interest as it is the first time on record that the fetal heart was heard in these islands.

The patient was a young woman aged 22 who was seen at the Dublin General Dispensary in November 1827 complaining of indigestion. "She told me her menses were regular and that her abdomen which I observed to be enlarged was so only occasionally. Indeed such was the excellent arrangement of the dyspeptic symptoms which she stated herself to labour under that she completely blind-folded me.

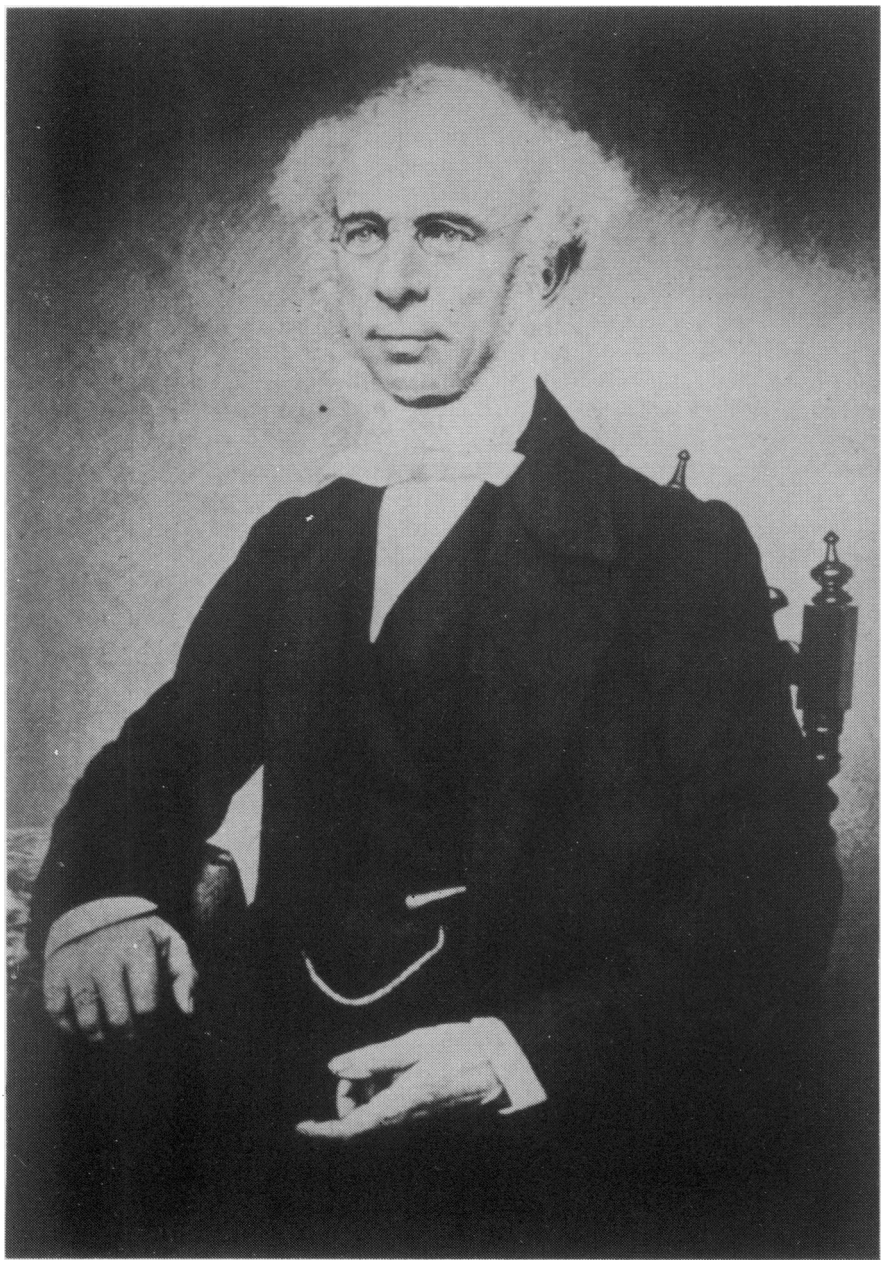
However on her third visit . . . no beneficial effects following the exhibition of the medicines ordered for her . . . I employed the stethoscope". Having convinced himself that he could beyond any doubt hear the fetal heart, he informed her that she was pregnant. The result was predictable. "The patient received the news" says Ferguson "with extreme indignation. Indeed this young lady's histrionic talent was of the first order and such was her well feigned agony at the very idea of her virgin innocence being ever suspected that had I not positive evidence of my senses to confirm the opinion I had expressed I should have felt extremely uncomfortable".

Another of his cases was encountered in December, 1828 in a village 60 miles from Dublin. This was the unmarried daughter of a respectable housekeeper whose apparent disease was ascites. "Unfortunately" says Ferguson "I had not a stethoscope with me nor could one be conveniently procured. Thus circumstanced I bethought myself of Laennec's original idea of the roll of paper which I used to some effect. With considerable difficulty and embarrassment I succeeded in discovering the pulsations of the fetal heart", So the suspicion of ascites was replaced by the certainty of cyesis; however respectable the unfortunate young woman was pregnant. This may remind some of us of the late Mr. Hardy Greer's anecdote possibly apocryphal of the old Scotch doctor called to see a young lady who was staying with her two maiden aunts. Her complaint was of swelling of the abdomen and the doctor was escorted upstairs to examine her. After he had done so and come down again, one of the old ladies said, "Well doctor, is it water on the stomach?" The old man regarded her gravely "Aye" said he "Ye may say that and there's a fish in it".

Unrecognised and unwanted pregnancy especially in the unmarried daughters of the snobbish or the unco guid have always been a source of rather cruel amusement to the rest of the world. But Ferguson despite his youth and the strict official sexual mores of his day was sympathetically aware of the tragedy that all too often cast its shadow over this situation. He tells how he was consulted by a girl of 18 accompanied by her married elder sister. Having diagnosed pregnancy and informed the unfortunate patient, who "denied stoutly and wept bitterly. I mediated" says he "between her and her sister, the only friend she had on earth. I hope it may never again fall to my lot to behold such a scene of mental anguish as I then witnessed. They left me, the elder sister promising faithfully she would not desert her and would take care that she attempted no violence on herself or her offspring". In the event she was safely delivered some three months later. Other young women were often less fortunate and undiagnosed and unbefriended until late in pregnancy or even even after delivery when concealment was no longer possible, these unfortunate girls destroyed their infants or even themselves. "Do we not daily" asks Ferguson "read accounts of unfortunate infants being either exposed or inhumanly murdered?" And his contemporary, the poet Thomas Hood writes compassionately of a young woman who has drowned herself:

> 'One more Unfortunate, Weary of breath,
> Rashly importunate, Gone to her death'.

Despite this promising start in clinical and experimental fetal cardiology I can find no other evidence that Professor Ferguson continued this work on coming to Belfast in 1850 after a successful career in Dublin during which he became successively



John Creery Ferguson, A.M., M.B., T.C.D. Hon. F. King's and Queen's Coll. Phys. I. 1802-65. First Professor of Medicine Queen's University. First President of Ulster Medical Society.

Professor of Medicine in Apothecaries' Hall and King's Professor of the Practice of Medicine of Trinity College, Dublin. Perhaps as first Professor of Medicine at the new Queen's College in Belfast, he was put off obstetrics in any shape or form by the formidable personality of his colleague in Midwifery Dr. William Burden whom as Professor Macafee[21] has recorded, was endowed to a remarkable degree with that pugnacity which seemed to be a characteristic of successful Professors of Midwifery. I should add that when Professor Macafee wrote this C.G. Lowry still occupied the Chair!

Ferguson seems to have been an unassuming and likeable person. In 1854 he had the distinction of being elected second President of the Belfast Clinical and Pathological Society and subsequently he became the first President of this Ulster Medical Society when it was founded in 1862 by the amalgamation of the Belfast Medical and the Belfast Clinical and Pathological Societies. Despite this he seems to have made little lasting impact on the local scene and his name is recorded with little or no comment in the various papers and documents I have been able to consult other than that he was a very popular man owing to his genial disposition and social qualities. His name is even inaccurately recorded as Robert Ferguson in the Whitla Institute list of Presidents of this Society.

Typhus and cholera were common in Ireland at that time indeed young Ferguson's father Dr. Thomas died from the latter disease during an epidemic in Dublin in 1832. During the same epidemic young Ferguson was sent to Ennis to take care of a cholera hospital and in the time of the epidemic which followed the famine of 1847 he again had charge of a temporary fever hospital. We are told of this in Cameron's 'History of the College of Surgeons'[22] and in Dr. Sidney Allison's 'The Seeds of Time' but we are not told that John Creery Ferguson was the first man in Britain to hear the fetal heart. This is greatly to be deplored here in Belfast where he was the first Professor of Medicine at Queen's and especially in this Ulster Medical Society of which he was the first president. He died on 24 June, 1865 and was buried in the little cemetery at Balmoral where a handsome monument to his memory was erected by his friends and colleagues.

Ferguson has received little recognition at home or abroad. Recently the registrars working in obstetrics and gynaecology in Northern Ireland founded a scientific society and I am pleased to say that they have decided to call it the Ferguson Club, a fitting tribute to one who though not an obstetrician nonetheless played an important part in promoting the welfare of the unborn child.

There is no portrait of him in the archives of the University or the Royal Victoria Hospital nor I regret to say of this Society. Some years ago however with the help of Miss Gardiner who was then the librarian, in the files of the Royal College of Physicians in Dublin I was able to find an old photograph of him. I have had this enlarged by Mr. Patterson of the Photographic Department of the Royal and suitably framed. I hope Madam President that you will accept this for the Ulster Medical Society so that there may hang in its rooms, a portrait of its first president who was also our first Professor of Medicine in the Queen's College and perhaps more significantly than either, was the first man to hear the fetal heart in the British Isles, John Creery Ferguson, Physician and Fetologist.

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INSULINOMAS IN NORTHERN IRELAND BETWEEN 1960 AND 1980

A Review of 16 Cases

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INSULIN secreting tumours producing inappropriate hyperinsulinism are rare. Wilder, Allen, Power and Robertson, in 1927 described the first patient in whom hypoglycaemia was shown to be related to carcinoma of the pancreatic islets, which were presumed to be secreting insulin. The majority of insulinomas are small benign tumours amenable to surgical removal. They cause severe metabolic and/or behavioural upset and are not always correctly diagnosed. Successful treatment depends upon clinical awareness, accurate biochemical diagnosis, radiological localization and precise surgical removal. Some tumours are malignant [1], [2] and these tend to metastasize to regional lymph nodes and the liver. Like other polypeptide-secreting carcinomas they are usually relatively slow growing, the hypoglycaemia tending to be more devastating than the catabolic effects of the metastases.

We report the experience of insulin secreting islet cell tumours at the Royal Victoria Hospital, Belfast. Sixteen cases have been treated between 1960 and 1980, 3 of which were malignant. These were, we believe, the only insulinomas associated with hypoglycaemia diagnosed in Northern Ireland (population 1.5 million) during the past 20 years so that the incidence was approximately 0.5 per million per year. The aim of this paper is to demonstrate the changes in diagnostic techniques which have evolved during the past 20 years, and to assess their value.

CLINICAL FEATURES

Ten patients were male and six female, with ages ranging from 18 to 74 years. Their symptoms at the time of presentation were varied and often bizarre with neurological and behavioural disorders predominating. Nine patients developed unusual behaviour patterns with psychological disturbances; 13 patients reported neurological symptoms including loss of consciousness, transient hemiparesis, epileptiform attacks, double vision, dizziness, staggering and/or numbness. Other complaints were of headaches and attacks of sweating, hunger or vomiting.

Perhaps the most spectacular complaint was from a patient (MR) who stated that she "woke up unconscious". This was her way of stating that people had difficulty rousing her each morning. Another patient (ET) lost consciousness in a golf bunker after numerous energetic attempts to remove his ball. One young man (HS) habitually went to his work as a labourer after eating a minimal breakfast — on a number of occasions while cycling home for lunch he collapsed and lost consciousness at the roadside. One adult man (JH) had been admitted to a mental hospital because of bizarre and inappropriate behaviour, culminating in an episode of "indecent exposure" when he went to the front door to collect the milk bottles on a Sunday morning before breakfast, without his trousers.

Two patients presented with weight loss (one of these was subsequently shown to have a malignant tumour); in contrast many of the others had gained weight. This may have been as a result of the anabolic effect of insulin or, alternatively, because the patients discovered that repeated carbohydrate intake modified their symptoms. Another patient, (LM) a diabetic on insulin treatment, had been found to require less and less insulin and was finally able to stop his insulin therapy entirely, before laparotomy for symptoms of intestinal obstruction revealed an insulin secreting pancreatic islet-cell tumour.

DIAGNOSIS

The initial suspicion that symptoms may be due to hypoglycaemia is the essential part of the diagnostic process, and was made by doctors from various disciplines. The suspicion was raised for six patients by a neurologist, in one by a psychiatrist, in two by general physicians and in the remainder by their family doctors. In all instances the triad was demonstrated of (1) symptoms compatible with hypoglycaemia, (2) a demonstrably low blood sugar, and (3) relief of the symptoms by taking glucose.

Confirmation of the suspicion requires biochemical and radiological investigation. Diagnostic tests during the past 20 years have included early morning fasting estimations of plasma glucose, prolonged fasting, an extended 50G oral glucose tolerance test and a 1.OG tolbutamide tolerance test. In twelve cases measurement of fasting plasma insulin by radioimmunoassay [4] was possible (normal fasting range 5-15 mU/1). The results of these tests are summarized in Tables I and II.

Early morning fasting plasma glucose was 2.2 mmol/1 (40 mg/100 ml) or less in 13 of the 16 patients: in 10 of the 11 cases where plasma insulin measurements were possible it was above 15 mU/1, and even the figure of 13 mU/1 in Case 15 is inappropriately high for the very low blood sugar of 1.5 mmol/1.

While fasting under supervision, all patients became hypoglycaemic. Only 4 patients required to fast more than 12 hours, the one who persisted up to 36 hours before demonstrating hypoglycaemia had the smallest adenoma in this series

TABLE I

Plasma Glucose and Insulin Data during fasting

Case		Age	Sex	Year of operation	Lowest early morning values of plasma glucose and corresponding plasma insulin		Lowest plasma glucose during prolonged fast and corresponding plasma insulin		
					Glucose (mmol/1)	Insulin (mu/1)	Glucose (mmol/1)	Insulin (mu/1)	time of fasting (hr)
1	M.O'N	38	M	1960	4.0	—	1.8	—	8.0
2	H.P.	39	F	1964	2.0	—	1.1	—	15.5
3	W.B.	66	M	1964	0.8	41*	1.4	41*	12.0
4	R.McC	41	F	1965	1.3	—	1.5	—	—
5	H.S.	43	M	1966	1.4	—	1.5	—	7.0
6	L.I'A	45	M	1967	1.1	240	1.1	240	12.0
7	M.R.	74	F	1969	2.2	75	2.2	75	14.0
8	J.H.	51	M	1972	1.1	20	1.8	29	10.6
9	J.M.	35	M	1972	1.5	36	1.4	36	10.5
10	M.S.	57	F	1973	2.2	18	1.9	21	6.0
11	E.T.	19	M	1975	2.2	16	1.5	23	6.0
12	J.D.	68	M	1975	3.3	100	2.0	23	24.0
13	A.S.	31	M	1976	2.8	125	1.1	—	36.0
14	L.M.	49	M	1976	1.2	116	3.1	165	10.5
15	L.McL	18	F	1978	1.5	13	2.5	64	10.0
16	S.McG	57	F	1978	0.8	41	1.3	30	10.2

Footnote :

* plasma insulin measured by Dr. C. N. Hales, Cambridge, by an early radio-immunoassay and reported to be "elevated".

(case 13). At least 4 patients became spontaneously hypoglycaemic during the night, and formal fasting was unnecessary — the problem was more one of clinical management with intravenous glucose infusions prior to surgery.

Fifteen of the patients were studied during an oral GTT, which was extended beyond 2 hours in 9 instances. The shape of the glucose curve was not informative: plasma glucose values were usually low throughout, with a very minor rise after the 50G glucose load. Two patients showed plasma glucose well into the diabetic range — case 7 was not known to be diabetic and had normal blood glucose values post-operatively. Case 14 was an insulin requiring diabetic before developing his islet cell carcinoma and has been recorded elsewhere [6]. The time of onset of hypoglycaemia after the peak of the curve was variable (up to 9 hours) and some patients were not followed sufficiently long to achieve hypoglycaemia. Only

TABLE II

Plasma Glucose and Insulin Data during Oral Glucose Tolerance Test, and I/V Tolbutamide Test.

Case		Age	Sex	Year of operation	Lowest plasma glucose following the peak of 50 g OGIT and corresponding plasma insulin			Lowest plasma glucose following 1.0 g tolbutamide I/V and corresponding plasma insulin		
					Glucose (mmol/l)	Insulin (mu/l)	time from Oral Glucose (hr)	Glucose (mmol/l)	Insulin (mu/l)	time from I/V tolbutamide (hr)
1	M.O'N	38	M	1960	1.4	—	9.0	—	—	—
2	H.P.	39	F	1964	1.6	—	3.0	1.1	—	0.25
3	W.B.	66	M	1964	1.8	—	4.5	1.1	—	2.0
4	R.McC	41	F	1965	1.6	—	3.5	1.5	—	0.5
5	H.S.	43	M	1966	6.7	—	2.0	—	—	—
6	L.I'A	45	M	1967	1.1	195	4.0	—	—	—
7	M.R.	74	F	1969	11.2	—	2.0	1.9	200	0.5
8	J.H.	51	M	1972	1.9	32	3.5	—	—	—
9	J.M.	35	M	1972	—	—	—	—	—	—
10	M.S.	57	F	1973	1.9	27	4.0	1.4	28	0.5
11	E.T.	19	M	1975	4.5	—	2.0	—	—	—
12	J.D.	68	M	1975	1.9*	46*	2.5	—	—	—
13	A.S.	31	M	1976	1.2	99	0.5	1.4	—	0.5
14	L.M.	49	M	1976	8.2	210	2.0	—	—	—
15	L.McL	18	F	1978	2.2	33	2.0	—	—	—
16	S.McG	57	F	1978	2.0	76	5.5	—	—	—

Footnote :

* glucose and insulin values observed following a mixed meal, rather than standard OGTT.

four patients, including the two diabetics, did not produce a plasma glucose of 2.2 mmol/1 or less during this test. In all cases where plasma insulin was measured it was clearly inappropriately elevated.

The I/V tolbutamide test was used prior to the introduction of insulin radioimmunoassay but only occasionally after 1965. Hypoglycaemia was certainly demonstrated rapidly in all six patients, but the levels of plasma glucose were not markedly lower than those achieved by simple fasting, and the test is not used routinely at present.

RADIOLOGY

Arteriography

Comparison of the arteriographic, operative and histological findings is made in Table III. Except in one patient (case 6) radiology was performed by the same radiologist (E McI). The main investigation used to localize the tumour was coeliac axis angiography by retrograde femoral artery catheterization. The examination was carried out under local anaesthesia with mild pre-medication. Hyoscine-N-butylbromide was used to prevent movement of bowel gas between the series. A standard 7-gauge polyethylene catheter, pre-curved for injection, was used. The technique required a rapid film-changer. Initially the coeliac axis was examined by hand injection of 15-20 mls Triosil 440. Films were taken for 15 seconds with emphasis on films in the capillary phase. These films were inspected and decision made on further views (either lateral or oblique with caudal or cephalad angulation, or superior mesenteric injection for super-selective catheterisation). Subtraction techniques were used for the examination of films.

Ultrasound Examination

A Picker Echoview with a 2.5 MH long focus transducer was used. Scans were obtained in longitudinal, transverse and oblique projections.

Computerized Axial Tomography

This was performed at 1.5 cm intervals through the pancreas. The equipment used was an EMI 5005/2085 scanner with a field of thirteen inches and a scanning time of 25 seconds. Scans were also obtained after enhancement with 50 mls Urografin 370. A further series of scans was then obtained during simultaneous enhancement with 25 mls Urografin 370 injected at 1 ml per second during each scan cycle.

The results of the radiological findings and their correlation with the surgical findings are listed in Table III. The only case of false-negative arteriography, (case 6) was investigated elsewhere; in all the remaining cases arteriography was useful in predicting tumour site. Benign insulinomas varied in size from one to several centimetres in diameter. They were well demarcated and showed a dense capillary blush. In contrast, the malignant tumours were poorly demarcated, had poor capillary blush and showed end-arterial distortion and neovascularity.

Ultrasonic examination demonstrated only tumours in excess of 3 cm. in diameter. It proved much more valuable in the head than in the body or tail of the pancreas. Computerized axial tomography appears promising particularly when simultaneous enhancement was employed.

These methods are illustrated in the figure.

SURGERY

Wide exposure of the whole pancreas was usually achieved by a long transverse epigastric incision. In six patients the tumour was in the head of the pancreas; these were locally resected without mortality but with considerable short-term

TABLE III

Radiological and Operative Findings

(All cases were islet cell adenomas except 6, 14 and 16 which were carcinomas).

Case	Coeliac Angiogram	Operative Findings
1	Not done	1.0 cm diameter tumour at junction of head/ neck of pancreas
2	Not done	1.0 cm diameter tumour at head of pancreas
3	Not done	1.0 cm diameter tumour
4	Not done	1.2 cm diameter tumour at junction of head and uncinate process
5	Not done	2.0 cm diameter tumour at junction of head and uncinate process
6	Normal (radiology elsewhere)	Two large modules in pancreas
7	Not done	1.0 cm diameter tumour at head of pancreas
8	Increased vascularity of head of pancreas	Large tumour upper/lateral area of head of pancreas
9	2 cm tumour in body	Tumour deep in upper part of head of pancreas
10	Capillary blush probably in head of pancreas	1.0 cm diameter tumour to left of neck of pancreas
11	Single tumour in extreme tail of pancreas	2.0 cm diameter tumour in tail of pancreas
12	4.0 cm diameter tumour in head of pancreas	Spherical tumour in head of pancreas
13	Small tumour to left of coeliac axis	No macroscopic tumour. Microscopic adenoma found after subtotal distal pancreatectomy
14	Large tumour extending from spine to splenic pedicle — 8 x 7 cm	Tumour of body/tail of pancreas 9 x 9 cm
15	3 tumours. upper head, high neck and extreme end of tail of pancreas (C.A.T. Scan: Abnormal thickening junction of body and tail of pancreas	3 tumours. 0.7 cm in neck 2.0 cm mid-body 2.0 cm extreme tail
16	Single large tumour in upper quadrant of head: ? another in neck of pancreas (C.A.T. Scan: Single tumour in head of pancreas	Massive tumour in head of pancreas. and multiple hepatic metastases

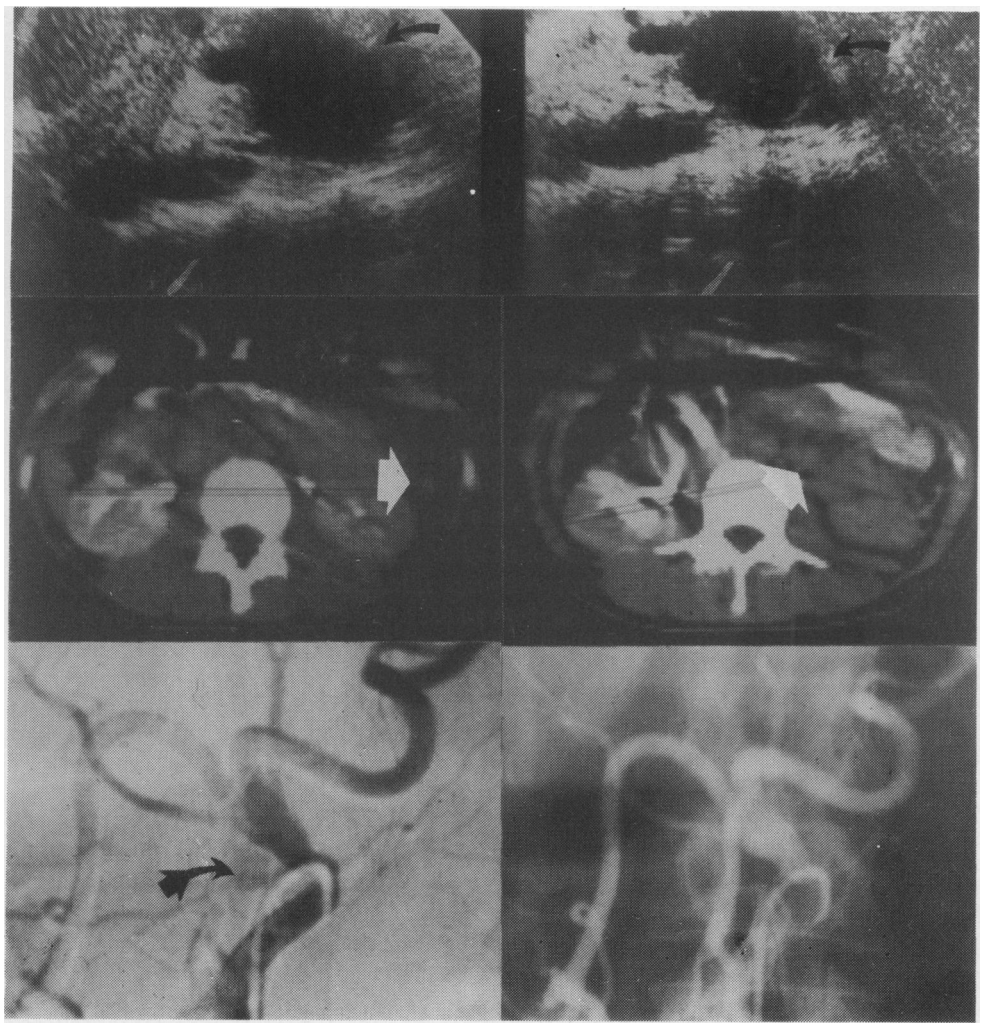

FIG. 1.

ULTRASOUND

The upper two sections show a large (3 cm.) insulinoma in the head of the pancreas — demonstrated by ultrasound.

C.A.T. SCAN

The centre sections show a single insulinoma in the tail (left), and another in the body of the pancreas (right) — following contrast enhancement of the C.T. scan.

ANGIOGRAPHY

The lower two sections demonstrate the requirement for subtraction technique to be applied to angiography in the unsubtracted Glms. The insulinoma is totally obscured by the spinal bone density on the standard engiographic view (right), whereas it is clearly indicated by subtraction (left).

morbidity. One tumour was intimately related to the common bile dust which was damaged during exploration; this was not recognized and lead to a subhepatic collection of bile requiring drainage subsequently. In two other cases a pancreatic duct was probably damaged, leading to fistula formation in one and a pseudocyst in the other. To minimise complications we now routinely use a hand lens to inspect the tumour bed for leakage of pancreatic juice: this leakage can be made more obvious by injection of secretin. When the tumour was located in the neck, body or tail, surgery was easier; a distal pancreatectomy was performed in seven patients and a microscopic adenoma was found. One patient with multiple endocrine adenomatosis had three macroscopic tumours in the body and tail, and three further tumours were identified microscopically. A "blind" distal pancreatectomy was performed in only one patient in whom a microscopic adenoma was found.

MEDICAL MANAGEMENT

Streptozotocin was given to two of the patients with malignant tumours (Cases 6 and 14), who have been reported elsewhere [5], [6]. One patient was an insulin-dependent diabetic who developed hypoglycaemia which persisted even after withdrawal of insulin therapy. He had an islet cell carcinoma with hepatic metastases. After intravenous streptozotocin he became hyperglycaemic and again required insulin. He relapsed after one year despite intensive streptozotocin therapy. Plasma gastrin was also initially elevated at 290-500 ng/l (normal 0-150 ng/l) with associated acid hypersecretion, and these values also fell to normal after streptozotocin. The other patient survived for four years, eventually dying from cachexia and renal tubular acidosis, which was most probably caused by the drug. A short course of diazoxide has been successful in maintaining a normal plasma glucose in case 16, where a large hepatic metastasis remained in situ: It is uncertain whether this lesion is still truly functioning and both glucose and insulin values have now remained normal for over a year without further therapy.

Only one patient (Case 15) could be considered to have multiple endocrine adenomatosis, on the basis of multiple islet cell adenomas and hyperparathyroidism. Cells within the islet cell adenoma stained positively for pancreatic polypeptide. Her father had both a pituitary chromophobe adenoma and a parathyroid adenoma, and a paternal uncle is known to be panhypopituitary.

Follow-up has varied from one to 18 years. Four patients have died. Case 3, W.B., died 6 years post-operatively from a cerebrovascular accident. Case 6, L.I'A., and Case 14, L.M., died 4 and one years respectively after their diagnostic laparotomies from malignant tumour metastases, although hypoglycaemia had been effectively treated and the cause of death was ultimate cachexia. Case 7, M.R., died of heart failure 7 years post-operatively.

In 11 patients a recent value of plasma glucose and insulin was available at review in 1979. Plasma glucose (random, mid-afternoon) varied from 4.1 to 9.0 mmol/l, and plasma insulin from 2.0 to 32.5 mu/l.

DISCUSSION

Insulinomas are uncommon and present in widely differing ways [3], [7], [8], [9]. The present series is typical of experience elsewhere in the high proportion of cases presenting with neurological and psychiatric symptoms. Stefanini et al [8] in a world-wide literature review of 1067 cases which included 9 of this series, reported neuropsychiatric complaints in 92 per cent of cases. Other presentations include gastroenterological symptoms and the generalised features of malignancy.

Since symptoms are intermittent and presenting complaints variable, long delays can occur before the correct diagnosis is made [7], [9]. The present study clearly indicates that awareness of the modes of presentation by doctors in widely differing fields is the vital step in diagnosis. Subsequent proof of diagnosis has become easier now that plasma insulin measurements are readily available. This has simplified many of the tests which were previously advocated [7], [10]. The present series shows that the plasma glucose and insulin results obtained in early morning specimens (at least 3), and if necessary during a relatively short further fast, allowed the diagnosis to be made biochemically in all cases where this combination was used. The prolonged glucose tolerance test was also useful in our series but others have pointed out the unreliability of the test [9], [11]. Currently, we investigate by collecting a series of early morning fasting plasma glucose and insulin specimens, the last of which is followed by a prolonged glucose tolerance test over 6 hours. On the next day, if hypoglycaemia has not been demonstrated, a prolonged fast is commenced with blood samples being taken every 6 hours for insulin and glucose measurements. The fast should be stopped after 2 days. During similar procedures each of our patients had, at some stage, unequivocal hypoglycaemia with a clearly raised plasma insulin; these findings agree closely with those reported in the series of Service et al [9], Scholz et al [12] and Clark et al [13].

A more frequent problem is encountered where indefinite symptoms might possibly be due to hypoglycaemia, but where a low plasma glucose has never been clearly demonstrated. We have not found any patient with an insulinoma who did not show unequivocal hypoglycaemia during early morning sampling, a prolonged oral GTT or during prolonged fasting up to 36 hours. The patient with the smallest lesion (case 13) clearly demonstrated inappropriate hyperinsulinism on early morning fasting measurements, but required up to 36 hours continuous fasting to produce symptomatic hypoglycaemia. More complex tests to provoke insulin secretion are unnecessary to exclude true insulin-secreting adenomas.

After the biochemical diagnosis had been established selective arteriography was impressive in localization of the tumour. Before this technique was introduced and adopted by Olsson [14] in 1963, tumours were found only by observation or palpation of the pancreas at operation. In our series a tumour as small as 2 cm in diameter has been visualized; others have claimed to see tumours as small as 0.5 cm [8]. There has been one false negative and one false positive arteriogram (86% success rate). Others have reported rather more false negatives, particularly when the lesion is in the tail of the pancreas [8], [15-18]. Our detailed technique has been given, as we feel that it is of considerable importance in enhancing the usefulness of the test; without subtraction tumours occurring in areas overlain by gas or over the spine or ribs may easily be missed.

Successful surgery requires accurate localization and adequate exposure. Even after reliable localization it is advisable to explore the whole pancreas in every case as the tumour may be multiple or the localization faulty. Though a vertical incision may be adequate, we have generally preferred a long transverse epigastric incision. When the tumour is in the head of the pancreas, local excision is safer than pancreatico-duodenectomy [8]; local resection was performed in 7 cases without the mortality reported elsewhere [8] but with considerable short-term morbidity. When the tumour was located in the neck, body or tail, distal pancreatectomy was performed in 7 patients. (One early patient underwent a blind distal pancreatectomy, a procedure which we no longer advocate). In circumstances such as these where no tumour is seen at laparotomy, distal pancreatectomy removes only about one third of insulinomas [8], [19]. In these circumstances intraoperative catheterization of the splenic and portal veins may be indicated in an attempt to localize the site of insulin secretion [20], [21].

In the present series, we have seen no recurrences after removal of a benign tumour. The incidence of malignancy (13%) is in keeping with that described elsewhere [8], [9]. In a number of cases local invasion was reported histologically, but these cases have not developed either recurrent hypoglycaemia or other sequelae of malignant disease. When metastases were present streptozotocin therapy was of considerable short-term help, although vomiting was a major problem and one patient (5) developed severe renal tubular acidosis after 4 years therapy, a complication which has also been reported by other workers [22], [23], [24].

We conclude that the basic methods of diagnosis of insulinoma have not changed since radioimmunoassays for insulin became available, and remain based on the simple demonstration of hypoglycaemia with inappropriate hyperinsulinism. A team approach to management in a specialized centre is strongly advocated; we have shown that arteriography is helpful in localization while skilled surgery by one team reduces morbidity and mortality. Although the outcome for patients with metastases was poor, in cases with histologically benign insulinomas only one recurrence of hypoglycaemia was seen.

We are grateful to Dr. J. S. Logan for his permission to report Case 5. The other patients were all at some time under the care of the Metabolic Unit. We are grateful to numerous colleagues for referring patients and for help and consultation during their management.

ADDENDUM

1. J.D. Case 12 died in 1980 from intestinal obstruction associated with recurrent hypoglycaemia. Autopsy at another hospital did not reveal any evidence of residual islet cell tumour in the pancreas or elsewhere, but the available biochemical evidence suggests that there must have been some recurrence.
   J.H. Case 8 has developed recurrent hypoglycaemia with inappropriate hyper-

insulinism in 1981, and liver scans show multiple hepatic secondaries. Review of the original histology in both cases 8 and 12 does not give any indication that either might originally have been recognisable as potentially metastatic.

2. Since writing this paper a further patient with an islet cell tumour in the head of the pancreas has been diagnosed and the lesion successfully removed.

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THEY COMFORT ME

The History of Nursing in Belfast

by

*** R. H. LIVINGSTON**

Consultant Surgeon, Royal Victoria Hospital

Annual Oration at the opening of the 1980-81 Teaching Session, Royal Victoria Hospital, Belfast

TWO duties are mine this morning, the first is a complete pleasure and it is to welcome the new class of students to this hospital. This is the traditional moment when you commence to walk the wards of a teaching hospital; when you meet patients for the first time; when some reality will distill from your dreams of what being a medical student was. It is fully understood that you have met patients earlier than to-day, nevertheless this is an important moment in your lives and the staff of this hospital have assembled to indicate their sincere desire that you succeed in learning from the patients, the staff and the daily work and discipline of this great institution. All those things are necessary to make you, quite simply, good doctors. A time will arrive, quite soon, when that title will be bestowed on you but the process of learning does not stop there. It is true the speed of learning may change but the process continues all through your working life and this is one of the rewards that a medical career offers you apart from the trust patients place in you.

My second duty is to deliver an address, called an oration on your programme, but this title should be taken to indicate the historical importance of the occasion, rather than the quality or form of what follows. This is no pleasure to me whatsoever but I ask you to bear with me for a little time. The title ("They Comfort Me") requires a word of explanation. Two years ago Dr James Elliott entitled his address, "Thy Rod and Thy Staff" and so I have dared to use the second part of that phrase in the Psalm, completely out of context with respect to its meaning, and apply it, of all things to nurses. What follows is the story of nursing in connection with the development of this institution.

The dependence of the patient on the nurse can be observed daily in any hospital and the medical staff in turn look to the nurse for the continuing care of their patients. I was quite young when one of my teachers told me to always "listen to what sister has to say" and this is at least one reason for the respect consultants in charge of wards can be seen to hold for the sisters they work with.

The origin of this hospital can be traced back to 1790 when a group of men, lay and medical, in this city aroused enough interest for the Belfast Charitable Dispensary to be opened. This was followed by the first hospital which was a rented house in Factory Row, in the area we now know as Smithfield. This took

*Mr. R. H. Livingston died in December 1980 before he had time to revise the text of his address for publication. In the circumstances the Editors have decided to publish it largely as it was delivered.

place in 1797 because of a typhus epidemic and one nurse was employed to tend the needs of the patients in six beds. This hospital ceased to function after several years because of lack of funds.

In 1815 the foundation stone was laid for the Belfast General Hospital in Frederick Street and the building was scarcely completed in 1817 when it was opened to patients on 1st August because of another fever epidemic in the city. It was designed for 100 beds but 212 patients were present at the peak of the epidemic. The site was on a common, bounded on one side by a few thatched cottages and on the other side at high tide its basement was almost washed by the sea which came over the large waste of grazing slope with ponds of water interspersed between it and the quay. The only public buildings near were the Old Poor House, Belfast Charitable Society and Saint Patrick's Church. A clear tract of land all around it allowed it to be ventilated by the sea air.

There is very little recorded about the nurses of that time in Belfast. It is certain they were considerably different from the present nurse and their duties involved preparation of their own and the patients food, the carrying of coal from the store to the wards, together with attending to the needs of patients who were confined to bed. They also had to wash the ward floors and the steps of the hospital. Uniform was not provided. Training for these people is not mentioned, so one assumes that the medical staff performed their dressings, applied their leeches, performed their cupping and blood letting themselves. Mention is made of workers in the laundry, so presumably the nurses did not have that task assigned to them but they did have to perform their own laundry. In charge of the nurses and laundry workers and any other female staff was a senior responsible female whose duties were as much housekeeping as being in charge of the nurses and she was eventually called Matron. In 1845 the total salary of the nursing staff amounted to £66. 14. 6d.

The hours of work were very long, meals were eaten on the job and a half day per week was the only time allowed when they could leave the buildings and then they were expected to go to Church for part of their free time. The pen picture of nurses in this era was sketched by Dickens and the Sairey Gamp and Betsy Prig characature of a gin drinking irresponsibility is the one that springs readily to mind. It would be totally unfair to let that picture be stored in your mind as the summary of nurses in that period, because there was one Anne Marshall who was admitted to the hospital as a patient and when she was recovering she made herself so useful in the wards that she was kept on. She was still with the hospital as Matron in 1849 at a time when the hospital was in dire financial difficulties to which she responded by donating all her life's savings of £61. 9. 10d. This act was recorded in the minutes of the Management Committee and it indicates a selfless dedication to the task of caring for the sick which perhaps set the standard for the School of Nursing which followed. A wall plaque to her memory can be seen in the hall of Bostock House.

Nurses and doctors work closely together and it is valuable to see the status and duties of the house surgeon as set out in a restatement of duties dated 1862.

He was regarded as having the chief authority in the hospital and was directly accountable to the Board of Management for its good government and for the morals and general conduct of the officers and servants. Medicine compounding and administration, together with the admission procedure and issuing of diet tickets were his responsibility. Charge of the wine and other stimulants and the surgical instruments and apparatus were his, together with the power of fining or dismissing any nurse or servant for neglect or impropriety of conduct. That is a shortened list, but it serves to show how much the status and duties of the house surgeon have been eroded over the years in favour of the nurse and perhaps it supports Mr Dickens' picture in the matter of wine and stimulants. Many of the nurses at this time could not read or write and local churches made provision on their Sunday half day to try and remedy this. This situation concerning nursing changed very little from 1817 until 1871. In that time additional accommodation had been built on to the Belfast General Hospital and some more nurses were employed but no training scheme, examination scheme or attempt to foster an esprit de corps existed.

In England and on the Continent of Europe a campaign for better nursing was afoot and this was initiated by Miss Florence Nightingale on her return from the Crimea in 1856. News of this eventually reached Belfast and public and medical opinion demanded an improvement in the nursing services. In 1870 at the Annual Meeting of the Governors of the hospital, the Hospital Board was requested to take such action as might be necessary. Some members of the Board visiting new training schools of nursing in England and King's College, London, and the Liverpool Training School were specially mentioned. In 1871 a report was issued which expressed the need for training for nurses as much as for medical men and suggested a separate institution for the purpose which should be managed by a general committee of 30 ladies and 30 gentlemen. The internal duties of the Home were to be under the immediate supervision of the ladies. This Home was to provide the nursing for the hospital and nurses for private nursing duties at patients' homes. A lady superintendent was recommended to be in charge of all the nurses and responsible to the Board of Management.

Probationers under training were to spend at least two months in a surgical ward, two months in a medical ward, then four months in a surgical ward, followed by four months in a medical ward, thus completing twelve months. "This training under the medical staff and officers of the hospital and an able superintendent form the keystone of the work and should command confidence. This is a matter of necessity, because, all who wish to nurse efficiently must learn to nurse in a hospital. The nurse when trained, should their normal conduct prove satisfactory, will obtain testimonials as duly qualified, renewable by actual examination from time to time. To the Ladies Committee will pertain the duty of inspecting all applicants, of inquiring into their eligibility and of recommending women from 25 to 35 years of age, able to read and write, as probationer nurses for a period of at least twelve months; who will be supported in the Home and receive fifteen pounds per annum wages for the first year, with a progressive rise of one pound for three years after".

Progress was made and Miss Merryweather, Lady Superintendent, the Training School, Liverpool, was invited to Belfast to give advice on the arrangements of the new Home, and the hospital offered a house free of rent for one year. A very special point agreed with the hospital was that the Lady Superintendent should have the entire control of the nurses in the hospital. Then an advertisement was inserted in the press offering a salary of £100 per annum for a Lady Superintendent. On 16th February, 1872, a general meeting was held in the Council Chamber of the Town Hall to meet Miss Merryweather and hear of the practical way of working in the Training School for nurses in Liverpool. She told the meeting that Liverpool had ten years experience of placing first two and then four Nightingale trained nurses in each ward as they were trained and two or three probationers were attached to each ward. She said many of her best nurses were Irish and while it was difficult to recruit the right sort of young women, much of her success was due to the operation of a superannuation fund.

The Board of Management of the Nurses Home and the Medical Staff of the hospital had several exchanges about the responsibility of the hospital Matron for some of the original hospital nurses and the Lady Superintendent of the Home having control of the nurses. They quickly agreed the following:

> "That each medical man shall be consulted before any new nurse be appointed to his ward".
>
> "The present staff of assistant nurses in the hospital was to be done away with and in future they were to be called household servants".
>
> "The present Matron of the hospital or her successor to have charge of all the bedding and furniture of the hospital and to have full charge of all the household servants and to look after the provisions and to be held accountable for the cleanliness of the hospital".
>
> "The Lady Superintendent not to interfere with the internal management of the hospital but should she object to any of the management to report the same to the Secretary of Staff, who will call a meeting of investigation".
>
> "The Lady Superintendent not to make a remark on the treatment of any patient as the Staff are alone responsible. but at all times to see the orders of the Staff faithfully carried out".
>
> "The regular staff nurses shall reside in the hospital".

This is how the Belfast Nurses Home and Training School came into being in 1872 and how the nursing of the Belfast General Hospital was put on a sure footing in line with the best in Great Britain. Of some personal interest to me is an item in the minutes 25th March 1872. "Gift of household linen from Messrs Richardson Son & Owden" the firm my father worked with all of his life. The following month one of their rivals in business, W. Quartus Ewart, provided a similar gift towards the furnishing of the Home. Miss Merryweather spent three weeks at the Home and on her recommendation Miss Persse was appointed the first Lady Superintendent. In November 1872 Dr John Moore and Professor Cumings were appointed by the Staff of the hospital to give systematic training to the probationers.

By 1873 the houses were too small for the Home and a new site was offered in Frederick Street and Mr John Lanyon was appointed architect to the Home and at the next meeting Sir Charles Lanyon reported on progress. In January 1874

a long letter from Miss Florence Nightingale was received by Miss Ottway and a few excerpts are of interest. "A good nurse must be a woman; a sick woman cannot be a healthy nurse. To induce a good and respectable young woman to your institution, to induce them to stay, to keep them in health, and above deterioration either of mind, souls or body, you must give them respectable and healthy accommodation, good food and the normal and physical helps necessary to keep woman up in hospital life, which, after all is said and done that man can say or do for the best, remains and always will remain, a great drain upon woman's life bodily and morale. Otherwise, women will keep themselves up as within remembrance of us all they have kept themselves up, by drink, by pilfering among the patients, and by the excitement of immoral behaviour. To draw a class into the nursing career who are above these things and to keep them above the very temptation to these things must be the very first object of all who wish to improve hospital and nursing generally". Much more follows, together with a plea for separate bedrooms, sitting rooms and good sanitation and finally; "Don't throw good money after bad, build new, if you build, build wisely . . . .". "I wish the Belfast Nursing Institution God-Speed with all my heart and soul and I would like to see it outstrip all its contemporaries, that they may in their own turn outstrip Belfast".

The Hospital Board minuted its approval of the new nursing of the hospital and the Hospital Medical Staff repeatedly remarked on the improved standard of nursing. At the time when the Belfast Nurses Home was established 120 medical students were attending the Belfast General Hospital and 14 nurses supplied the needs of the hospital. About this time "Regulations as to the training of probationer nurses" was printed presumably as a brochure for aspiring candidates. The age was as stated above and the need for testimonials of character according to the forms supplied.

> "They will be supplied with board (including tea and sugar), lodging and washing".
> "The wages of a probationer during her year of probation will be £14.14 of which a proportion may be retained till the end of the period as a guarantee of good behaviour and subject to forfeiture in case of misconduct".
> "It is expected that at the end of a year they will be fitted for nurses and their engagement will require them to serve two years more in hospital, district or private nursing".
> "The duties of the nurses will be to attend the sick both rich and poor".
> "All nurses and probationers will be provided with a sufficient allowance of beer or porter, to take at meal times, but they will not be allowed to procure or ask for wine or spirits without the express recommendation of a medical man".

In 1874 The Society for Providing Nurses for the Sick Poor was instituted and in the first annual report in 1875 it was noted that

> "The general ignorance and neglect amongst the poor of the commonest sanitary matters".
> "How often the doctors' instructions fail to be carried out from want of knowledge".
> "Restoration of health is frequently prevented by inability to procure or cook suitable nourishment".

The Society sought the best methods of providing experienced nurses who would minister to the sick in their houses and teach the principles of sick nursing. Arrangements were made with the Nurses Home to provide nurses for districts in the City. The total cost of one nurse was £100, of which £41 was salary and

the balance the cost of her up-keep in the Home. Thus district nursing services commenced in Belfast. Despite the small salaries received by nurses, in 1875 a notice in the News Letter records that "Yesterday the nurses employed at the Belfast Royal Hospital presented Dr. Whitla, late senior house surgeon, with a gold Albert Chain, accompanied by an illuminated address, as a mark of their respect on the occasion of his leaving the Institution".

In this year the Royal Charter was bestowed on the hospital and in October a newspaper article announced that the new building for the Nurses Home and Training School would be ready on time in February 1876 and that liberal gifts had been received from all over Ulster. It referred to; "The anxiety on the part of families suffering from illness to avail themselves of the carefully trained, intelligent kindly nurses attached to the establishment". Later in a recruiting fervour it continues; "Who so powerful a fellow labourer with the wise physician? who so efficient an assistant to the skilful surgeon as a loving, tender, neat-handed, trained nurse? She is as necessary for the cure of disease as the doctor; nay the recovery from illness depends almost more upon the careful watchful nurse, than the prescriptions of the physicians. He sees the patient for a few minutes, she watches hour by hour through the long watches of the silver night". And later; "The establishment of the Training School for nurses presents the opportunity for pursuing a useful as well as profitable career for steady and intelligent women".

In 1875 Charles Folliott Fox RN was selected out of 28 candidates to be general superintendent of the hospital at a salary of £200 per annum with rations and residence. Perhaps this further erosion of the status of the house surgeon stimulated the idea but on receiving the Royal Charter the hospital rules were re-written or re-copied and it was re-stated that the house surgeon had the power to dismiss any nurse etc. This led to a flurry of published statements in the press between the Board of the Home, stating that this was the sole responsibility of the Lady Superintendent and individuals who defended the Hospital. Miss Ottway the Honorary Secretary of the Nurses Home resigned as a result and some sort of calm returned after conciliatory meetings had taken place between members of the two committees. No record of a change in the house surgeons' duties appeared however. In 1876 the second Lady Superintendent of the Home resigned and received a silver cake basket and salver which was put on public display in Neill's shop in High Street. In her place Miss Notcutt from St Thomas's Hospital was appointed and a strange sentence expressed the committees sense of the kindness of the house surgeon. In May of that year His Grace the Lord Lieutenant (the Duke of Abercorn) with Lord Claud John Hamilton, Sir Charles Lanyon and Lord Templeton not only visited the Belfast Royal Hospital, but also visited the new Nurses Home situated on the opposite side of the street to the hospital.

The years passed with growth in the hospital work and in 1878 the Nurses Home undertook the whole nursing of the hospital for £560. There were 14 staff nurses in the Home and 24 probationers in training and the Home had provided a Matron to Downpatrick and to Derry Hospitals. The first examination on completion of nurse training was introduced in 1890 and a uniform was enforced which was not popular at first. In 1877 the first mention was made that the lease

on the Frederick Street Hospital site would run out in 34 years time and that the City was closing in around the present site to such an extent that the question of a new site for rebuilding was discussed. In the years that followed the Countess of Shaftesbury, on the occasion of her son (the Earl of Shaftesbury) attaining his majority, presented the lease to the Hospital Board at a nominal rent for 10,000 years and specifically said the site could be sold to facilitate the move to a larger and more advantageous one. Later The Belfast City Council made a gift of the Old Asylum grounds for the purpose of accommodating the new Royal Victoria Hospital, which name was graciously consented to by Her Majesty Queen Victoria in 1897 at the time when £100,000 had been collected for the building fund. The tender of McLaughlin & Harvey Ltd was accepted in 1900 and they have been on and off the site ever since. The new hospital was opened in 1903.

Within the same span of years the nurses obviously increased their participation in patient care and one record of this appeared in the press when a nurse giving out the medicines to patients gave a measure of carbolic acid instead of black draught. The recipient complained it was not right and to prove her conviction she swallowed some herself, only to recognise her dreadful mistake. The patient died and the poor nurse was seriously ill for weeks. This responsible task is still entrusted to nurses but the control of drugs remains constantly under review and the ordering by medical staff and the execution by nursing staff is a very important point of liaison between both professions. The nursing hours remained long and a well wisher highlighted this condition in the press in 1895 only to be taken to task a few days later in a letter from a nurse, who gave answer on behalf of the profession, that nursing hours were not peculiar to the Royal Hospital but were a world-wide practice and that it was not consistant with thorough and scientific nursing to have any other arrangement.

The Hospital Management acted in a dual capacity to attend to the affairs of the Royal Belfast Hospital and of the developing Royal Victoria Hospital project. In 1901 they advertised for a lady matron for the Royal Victoria Hospital not less than 35 years of age and salary £80 per annum and eventually Miss M F Bostock, who had some years of experience in a similar position at the Throne Hospital, was appointed. The nursing staff moved to the Royal Victoria Hospital and was augmented by some additional appointments. Some probationers from the Nurses Home transferred to complete their training and by 1905 the last of these returned. Thus ended an epoch in the nursing story and a new school of nursing within the Royal Victoria was born. At the outset there were 62 nurses in all comprising, one night superintendent, eight sisters, 21 staff nurses and 32 probationers. The Night Superintendent's duties are interesting and included;

> "To go anywhere and everywhere the nurses are employed and she is obliged to visit all wards frequently".
>
> "The resident qualified officers shall have the right to visit their own wards and the wards of any other colleagues if required for any special professional purposes. at any time of the day or night".
>
> "She shall when requested cause to be prepared and sent to the doctors' dining room a cup of tea or other light refreshment".

It was evident that a strict house discipline was practised and on Boxing Day a tea party in one ward caused nurses to leave some wards unattended and some left only in the care of a probationer. Matron assembled the staff and announced if she heard of a nurse leaving her ward without permission she would be summarily dismissed. While a "tight ship" was run, a sense of fun also seemed to be there and she passed a request by the Resident Medical Officers that the Nursing Staff be present at a dance in the Castle Restaurant. This obviously became a yearly function. Woe betide the nurse found asleep on duty or found guilty of theft and indeed, the practice of sending a probationer nurse to call resident pupils from their bedrooms to perform some duty in the Casualty Department was stopped because there was no check on the movements of the nurse. Consideration for her nurses was reflected in a request to management to provide porters to carry soiled dressings from the ward to the destructor. At the end of her term of office in 1922 the nursing staff had increased to 125 and she had kept the hospital staffed when large numbers of staff nurses were attracted into the Armed Forces Nursing Services during 1914-18 war, and injured troops from France were sent to Belfast via troop ships to Dublin and train to Belfast. The nursing hours were reduced to 56 per week in 1919 and the nurses wrote to the Nursing Committee saying they would prefer one day's leave per week rather than an eight hour shift system.

Miss Bostock had her training at Leeds General Infirmary but was connected with the Royal Victoria Hospital in some senior form for 34 years. Her standing amongst her colleagues was high and she was a member of the General Nursing Council for Ireland and the College of Nursing. This indicates that she was actively involved in the formation of the College of Nursing which was registered in 1916 and this focussed activity which led to the Nurses Act 1919 and under this Act the General Nursing Councils were set up for England and Wales, Scotland and Northern Ireland. These latter bodies became the Examining and Registration Bodies for Nurses and it is remarkable that this came about twenty or more years later than other countries, largely because of the Nightingale influence which was opposed to it when first suggested. Once established, however, developments came fast. The College of Nursing published a document in 1919 popularly known as the Nurses Charter which called for a 48 hour working week (when the maximum was 70), proper accommodation, systematic training, adequate salaries and a pension scheme.

The incoming Matron in 1922, Miss Annie E Musson, trained at Nottingham General Hospital and served as a nurse in the 1914-18 war before coming to Belfast. Much of her influence could be viewed as applying the Charter to the Royal Victoria Hospital. Early she arranged for probationer nurses to have instruction from the Sister Tutor daily between spells of work in the wards. Then new departments were formed in which nurses participated and the first seems to have been massage and electrical treatment followed by nurse radiographers, nurse electrocardiography technicians and nurse dieticians. The hospital work was extending rapidly as the population of the City increased and rioting taxed the accommodation and staff greatly as the new North of Ireland State established itself. The nursing staff grew in numbers and soon huts were erected to accommodate them.

In 1924 and 25 three additional wards were added to the hospital corridor and each existing ward was extended in length to their present size and an additional building for nurse accommodation was provided at the front of East and West wings and known as the Musgrave Wing. A note of special pleasure marked the completion of the nurses classroom in 1926 and medical students may be interested to know that for many years their predecessors attended bandaging classes conducted by the Nursing Tutor. At this time a staff nurse's salary was £45 and the Matron thought a better standard could be obtained if a salary of £60, rising to £65 were offered. She obviously was successful because two years later she requested that theatre staff nurses, at present getting £65 should get £70, because "this will give surgeons and patients a better service than a constant change of nurse".

The Student Nurses Association was formed in 1927 and a badge for nurses trained in this hospital was introduced in 1931 and the following year management was pressed to accept the Federated Superannuation Scheme for nurses. Following this a system of scholarships was introduced for gold and silver medalists in the nursing examinations to receive their midwifery training in the newly established Royal Maternity Hospital. An insight into a Matron's mind is given by her attitude to the 'no smoking' rule which she realised was frequently broken in the bedrooms. Because this was a dangerous practice, it was legalised in certain rooms but never allowed on duty. The new Nurses Home was built about 1935 to provide additional accommodation for nurses required for the Royal Maternity Hospital and the Musgrave Clinic. The new nurses classrooms were there and some Royal Victoria Hospital nurses were accommodated there from 1937 onwards. In 1950 it was named Musson House.

A preliminary training school (PTS) for probationers had only been a part-time affair until 1939, but then a case was made and a full-time PTS was introduced and eventually the £10 entrance fee paid by nurses was discontinued, but replaced by a £5 deposit for the PTS course which was repaid if success was achieved in the examination. The story becomes very much within personal memory from this period in time and Miss McFarland went to Manchester for a course in orthopaedic work in 1943 and she was a latter day Matron. One of the final acts of Miss Musson concerned the image of the Royal Victoria Hospital nurses and with the end of the war, despite coupons being required, nurses were to wear stockings again. "Nurses feet are stained and dirty and unpleasant and in my opinion are a disgrace to the hospital and the uniform". She had seen the hospital through two blitzs on Belfast and managed with many staff absent on war service. The nursing strength had risen to 191. Bridging three matrons' work in the 'Royal' and having been trained in the Nurses Home in Frederick Street was an outstanding night superintendent, Sister Dynes, MBE, or more familiarly to many present here as Diana. Dr Calwell, the present Archivist, is responsible for some verses:

Who walks about at night?
Whose step is far too light?
Who puts the pups to flight?
Diana.

Whom have we often heard
Chasing the early bird
Bedwards, without a word?
Diana.
Who like some olden Queen
With a forbidding mien
Says "Nurse what do they mean?"
Diana.
So may she long remain,
Some to praise, some to blame
Throughout the year, the same
Diana.

She was night sister for 44 years from 1909 to 1953 and many nurses and doctors benefited by having met her. She died in 1968.

In 1946 Miss Florence E Elliott was appointed as Matron; the first Royal Victoria Hospital trained nurse to do so. To her fell the task of adjusting to the changes brought about by the introduction of the National Health Service in 1948. The nursing and medical staff commenced to expand almost at once and a new look was given to the nurses who were required to wear white shoes and stockings and this change was supported by the statement; "It is believed that black shoes and stockings are more severe on the feet than any other colour". Along with this went a request for four weeks annual leave, instead of three and this was instituted on 1st January, 1947. She awarded the Matron's prize for second year ward work to one Doreen McCullough, who is the present Chief Nursing Officer of the Department of Health and Social Services N.I. and responsible for the "Report of the Joint Working Party on Nurse Staffing in Belfast". Arrangements were made to employ male nursing orderlies and for the training of male nurses, but the response to the latter was disappointing and has remained so in this hospital. The Students Nurses Association had its 21st birthday and its founder, Miss Musson, attended to cut the cake. Miss Elliott was the main force in forming the Royal Victoria Hospital League of Nurses in 1949 and Miss Musson was elected its first President. This body has done much to keep nurses in contact with the hospital and has contributed to staffing by encouraging ex-nurses to work again. With increasing numbers of nurses in training an additional tutor was appointed and in 1950 "The Beeches" in Hampton Park was acquired to house the PTS where 28 probationers were accommodated each time. This relieved the pressure on the Royal Victoria Hospital classrooms where study days and block study weeks for student nurses were being introduced. Short spells of experience at the Northern Ireland Fever Hospital and the Ophthalmic Hospital were integrated in the course.

Discipline was strict and in those days radium needles were in use and the care of these both in and out of the patient will stir memories of searches extending from the patient to the incinerator often with the ready assistance of Dr Leeman and his forerunner of the Geiger Counter. One nurse was seriously disciplined for failing to exercise due care. Various special departments began to

grow in the hospital and the first full-time theatre sister was appointed. The Fracture Clinic existed already but was followed by wards set aside for fracture cases only. Neurosurgery became established, Metabolic Medicine and Cardiology commenced to separate off from general medicine and optpatient attendances increased tremendously .Nursing and medical staff were stretched considerably as the demand for treatment multiplied and the tempo of work increased.

New accommodation for nurses was provided in 1950 when Bostock House was opened and shortly afterwards a new floor was put in the lofty outpatient hall to extend this department. Additional nursing staff was in constant demand and the competition for this scarce commodity caused friction between departments on occasions. Miss Elliott revealed a character which compelled the respect of the Medical Staff and the devotion of her nurses throughout this difficult period. Eventually a theatre block had to be built and thus another new nursing department evolved in 1965, together with its recovery ward. It is a source of pleasure to many when Miss Elliott, who now lives in Australia in retirement, pays us a visit, as she did this year. One phase from her speech at the Nurses Prizegiving, in reference to unrest in nursing circles over pay is memorable; "Always remember the patients, they cannot go on strike". With her retirement in 1966 the hospital fell into the hands of specialist orthopaedic nurses, first Miss Kathleen Robb and then by Miss McFarland in 1973 for a short period of office and strange to say the place did not fossilise in plaster of Paris. A time has now arrived when personalities are still in post and comments will be omitted. The Outpatient Building, together with the Respiratory Intensive Care Department, were built and staffed with nurses just in time to meet the onslaught of "The Troubles" which commenced in 1969. Following this the world became especially aware of the quality of Royal Victoria Hospital nurses and their humanity, skill in ward, theatre and casualty department, their unselfishness with regard to time, energy and personal safety and their adaptability. The efforts of those who taught and inspired them must have had something to do with this.

In 1973 reorganisation of the Health and Social Services arrived on the scene following the Salmon report which re-arranged the nursing hierarchy from the rank of ward sister upwards and the Briggs report which cleverly assessed nursing needs for the Integrated Health Service. These events all affected the Royal Victoria Hospital. First Miss Robb was translated upwards and out of the hospital and the post of matron ceased to exist. A new Salmon type post was eventually filled by Miss Heather Barratt. She will realise by now that those trained outside Northern Ireland have played important roles in the developing of nursing here and have been much loved and respected and I think she knows that in her case not only the new person but the new system was being assessed. The post of matron of the past was demolished because she exercised autocratic hierarchy and did not share responsibility with assistants and deputies. The new system aims at providing tiers of promotion above the rank of Sister associated with levels of management responsibility. Secondly the Royal Victoria Hospital School of Nursing ceased to exist and was replaced by the Belfast Northern Group School of Nursing, which in many ways represents a reversion to the Belfast Nurses Home structure with its independent board and finance and aim to provide nurses

for all walks of life. Nurses in future will not be trained solely with the hospital needs in mind but district nursing, health visiting, mental and maternity nursing, to name but some, will be included in the courses. To achieve this, more time on courses of instruction and less time spent on the wards has had an effect on staffing levels, together with the loss of staff nurses at a very early stage to one of these non-hospital fields of work. While student nurses spend less time on the ward, trained staff nurses become increasingly necessary on a purely numerical consideration, never to mention the increasing complexity of medicine and nursing. The average period of work given by nurses to this hospital after registration is 26 weeks and this appears to be far too short for the good of the hospital needs and for the good of the staff nurses. The General Medical Council has applied a one year period of special supervised work in hospital before fully registering the newly qualified doctor after a much longer course and it is doubtful if the nurse is any different on obtaining her "fall". The Royal College of Nursing has wielded influence causing change in the past and it is hoped they will act in this matter. Many believe that management posts have been created and management training multiplied at a time when there is a great scarcity of nurses at the bedside. The stated aim was to increase the quality of care but as a biased observer, well established in the hospital scene, it appears that quality of care has only been maintained by greatly increased effort on the part of those nursing in the wards. In contrast the advantages of losing nurses to the districts is not yet evident; it is more difficult to get a geriatric patient home than five years ago; the outpatient attendances for dressings have not reduced, to name but two examples.

Nursing is a profession with carefully guarded ethical standards and it provides rewards in job satisfaction and a knowledge of contributing a service. It seems unfair that similar entrance requirements in the banking field are rewarded immediately with a salary which a nurse only attains after three years training, never to mention residential requirements and unsocial hours of work. Medical staff believe that the pay of nurses should be appropriate to the training and responsibility they carry and that their accommodation should be so good as to compensate for the necessary residence and unsocial hours. We also appreciate the privilege practised in this hospital of being involved in nursing appointments, but believe it should be a right. The nursing and the medical professions must actively foster co-operation in the affairs of each for the ultimate benefit of the patient. Let us both stand firm in the practice of training our students in a hospital. In 1821 Graves introduced bedside teaching in the Meath Hospital, Dublin and Sir Philip Crampton followed in surgical teaching in 1834. This practice soon became the Hall Mark of British medical training. Miss Florence Nightingale adopted the same principle for nurse training. Let us resist the call of educationalists towards a purely academic course and those who say; "Going round wards is not the ideal way to produce doctors". In an institution like this our senior nurse should be in full control of the hospital nursing with only the requirement to report to district level.

Recently the health budget was cut at a time when several areas of this hospital were not functioning because of shortages of nursing personnel. Funds were available for these nurses as they were found, but this is no longer the case. The

demand of patient need has not decreased and it is hoped that these areas will soon be fully staffed. Irrespective of criticism of the present nursing structure, the nursing staff of this hospital are outstanding and it was because of this I chose to arouse your interest in them and their problems. They must always be treated with respect and supported because we cannot do our work without them, but far beyond that is the friendship, support and encouragement they give us, their medical colleagues. In closing I wish you great success in the clinical part of your course and commend to you our sister profession, some of whom will be learners with you, while others have a lot to teach you.

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A PRELIMINARY REPORT ON TRANSSEXUALISM IN NORTHERN IRELAND

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INTRODUCTION

TRANSSEXUALISM may be defined as a disturbance of gender identity in which the patient's biological sex is incongruent with their psychological sex, and they persistantly seek to live as a member of the opposite sex, that is, in keeping with their desired or psychological sexual role.

This is a descriptive study of 32 patients who were referred to the Department of Mental Health, Queen's Univrsity, Belfast, expressing a desire to live as a member of the opposite sex. When patients present with this phenomenon a differential diagnosis of transsexualism, transvestism and male/female homosexuality must be considered. Transvestism is a condition where an individual finds it necessary to dress in clothes of the opposite sex in order to maintain, but often to initiate, sexual arousal and a homosexual is one who seeks sexual satisfaction from individuals of the same sex. Twenty-eight of the patients were diagnosed as transsexual, two as transvestite and the remaining two homosexual. The 28 transsexual patients, 21 males and seven females, will now be considered in detail.

FINDINGS

Northern Ireland has a population of one and a half million. The 28 patients known to the clinic gives a prevalence of transsexualism as 1 in 52,000 in a ratio of 3 : 1 male to female. They presented over a period of 14 years giving an average of two per year.

Their age at presentation ranged from 14-46 years, giving a mean age of 26 years. A study of the marital status of these patients showed that 19 were single, four were married and five were divorced. Four of the group were unemployed, six were students and 18 were in full time employment; 13 of these were skilled workers and five were unskilled. Twenty three belonged to a religious denomination in a ration of 2 : 1 of the two main religious groups in the Province. The other five professed to have no religion. Sixteen of the group were referred by their general practitioner, 10 by other psychiatrists, one was referred by the medical officer at a casualty department and the other just turned up at the clinic asking for a sex change operation.

On presentation a clinical and psychological assessment was carried out on each patient. Some of the relevant clinical findings will be reported here. Onset was assessed as early if the patient had gender identity difficulties before puberty. Those who began to experience such difficulties at or after puberty were con-

sidered to have a late onset of their transsexuality. This method of classification has been used before [1]. Fourteen patients, 11 males and three females, reported an early onset. The other 14 had a late onset and were composed of 10 males and four females. All the patients had cross dressed at some time before presenting at the clinic. This included the two patients diagnosed as homosexual and the two diagnosed as being transvestite. Further cross dressing in the 28 patients who remained in the study will be discussed later. Nineteen patients recall one of their parents being dominant during childhood and adolescence. Fifteen were male and four were female. The dominant parent in all cases was the opposite sex to the patient. Seven males and three female patients required treatment for enuresis during childhood. Five patients were adopted children, four males and one female.

Half the patients had a personal history of psychiatric illness, eleven males and three females. The illnesses included psychotic episodes, acute transient disturbances; anorexia nervosa and depression. Four males and three females had a family history of psychiatric illness. Six patients had both a personal and a family history of psychiatric illness. One patient had a family history of psychiatric illness but had no personal history of such illness. The patients were considered to have had homosexual experience if they participated in sexual activity with another individual of the same biological sex and that they were not performing in their desired or psychological role at the time. Eight males and four females were considered to have had that kind of experience. Three males and one female patient had been in difficulties with the law but their criminal activities were not of a serious nature.

Eighteen patients are still living in a state in keeping with their anatomical state. Seven are living in keeping with their desired sexual role, one has had gender reassignment surgery and two have died. Ten patients have lapsed from the clinic, three did so because they were unable to accept the real life test, that is living and working full time in their desired sexual role. This is required before any physical treatment including gender reassignment surgery can be considered. Two patients lapsed when told that gender reassignment surgery was not available in the province. The reason the other five lapsed is not known. Three have emigrated to England to seek gender reassignment surgery. Two have left the province for personal reasons, two have been admitted to long stay wards in a mental hospital and nine are currently attending the clinic. Of the nine who are currently attending, two are participating in the real life test, five are preparing for this process and two are considering this possibility.

Two patients in the study have died. The death of one patient followed an overdose of drugs in the setting of severe despair when told that gender reassignment surgery was not readily available. The other died from the side effects of a hormone preparation taken in large quantities following an acute psychotic attack. This case has been described elsewhere [2]. Prior to their death both patients were living in their desired sexual role.

Of the eighteen patients still living in keeping with their anatomical role nine had an early onset and nine had a late onset of transsexualism. 11 of these patients had a personal history of psychiatric illness, 11 had a dominant parent

of the opposite sex and seven had a history of enuresis. Of the seven patients living in their desired sexual role, three had an early onset of transsexualism and four had a late onset, one had a personal history of psychiatric illness and three had enuresis. Twelve of the 14 patients who had a late onset of transsexualism participated in homesexual activity while only two with an early onset did so. Twelve of the patients who participated in homosexual activity had a dominant parent of the opposite sex.

DISCUSSION

This study shows a prevalence of 1 : 52,000 for transsexualism in Northern Ireland, that is if all the transsexuals in the province attend the clinic. There is no evidence for or against this. It is well known that many people live out their transsexual lives without ever seeking help. This figure is a little higher than the 1 : 66,000 recorded in England and Wales [3], but very similar to the 1 : 54,000 reported in Sweden [4]. The 3 : 1 male to female ratio supports a similar finding [5] but does not support the suggestion that the ratio is now approaching 1 : 1 male to female [6]. The number of patients seen per year varied from nil to four with an average of two annually. This is not in keeping with the trend towards an annual increase [6].

The age of presentation suggests that males tended to seek help earlier than females, supporting the idea that men find it more difficult to tolerate transsexualism than do females [7]. The females tended to present at a time when pressure was being placed on them to participate in heterosexual activities, marriage and child bearing.

Considering the marital status of this group most of the patients found marriage unacceptable. The males tended to marry with the hope that it would "cure" them of their transsexual ideas and the females reported that their lives followed a routine of boyfriend, engagement, marriage and for some patients, children. This programme was greatly influenced and motivated by society and not by the individuals themselves.

Intercorrelation between variables showed a high positive correlation between living in desired sexual role and no personal history of psychiatric illness. Late onset of transsexualism was positively correlated with homosexual activity which in turn was positively correlated with a dominant parent of the opposite sex. The high rate of enuresis in this group of patients was remarkable. Enuresis was positively correlated with a late onset of transsexualism and a personal history of psychiatric illness.

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THE MASTECTOMY ADVISORY SERVICE

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THE Ulster Cancer Foundation was established in 1970 with the threefold aims of: supporting research in Northern Ireland, the establishment of a cancer education programme, and helping to fund the Chair of Oncology at Queen's University of Belfast.

At education meetings, many questions were asked about the management of women who had a mastectomy performed. It was obvious that little or no information had been given to these women about prostheses, clothes, etc., nor had any psychological support been offered in dealing with husband and family. As nearly five hundred women undergo mastectomy each year in the province, it was obvious that there was a great need for support and help in this field.

In 1975, the constitution of the Foundation was changed to include the provision of cancer care. An article on the problems that these women faced was published in the local press and on appeal was made for volunteers to help. The response was dramatic. Thirty women who had undergone mastectomy at least 2½ years previously were selected to train as our first volunteers. A training programme was drawn up and has since been modified as required. The potential volunteer is interviewed and selected by our officers. The training consists of six lectures given by a surgeon, a radiotherapist, a psychiatrist, a sister from a female surgical ward, a volunteer and a member of our staff.

The surgeons in all the hospitals were informed of this new service. Many already used former patients selected personally to advise their new patients. After an initial slow start, our volunteers are now invited into all hospitals in the province. Nursing officers and ward sisters from all hospitals were invited to attend symposia held in headquarters. Lectures were given by a surgeon, a radiotherapist, a volunteer and member of staff. Visits to Belvoir Park Hospital were arranged.

In 1977, a "mastectomy centre" was established. It contains a permanent display of bras, prostheses, aids, swimwear, etc. There is an extensive selection of literature available to patients, relatives and nurses. Our own booklet "Reaching to Recovery after Breast Surgery" was favourably reviewed in the British Medical Journal (1980): the reviewer concluded by stating that any surgeon who undertakes a mastectomy should have a copy and base his advice on it.

The organisation has developed rapidly. The volunteers meet at headquarters four times per year. Now, many of the clients come as well. The aim is to provide something positive. A speaker talks on a topic which will be helpful to many of the audience. These meetings have become so popular that they are now also held twice a year in several provincial towns. An annual dinner is held in many towns. A social weekend is held annually in Castlewellan Castle.

All advice given is non-medical. Originally, when a patient was about to undergo breast surgery the ward sister requested that a volunteer visit the patient. The visits are arranged through the co-ordinator at headquarters. Experience has shown that it is much better to visit the patient three or four days after the operation. A number of patients had been counselled and biopsy proved negative so mastectomy was not performed.

The volunteer brings a soft temporary prosthesis to the hospital when she visits the patient. This expense is borne by the Ulster Cancer Foundation. This boosts the patient's morale and preserves her self image. One of our booklets is given to the patient. A follow-up visit is arranged when the patient goes home from hospital.

There is a wide variety of extremely sophisticated breast forms available for patients. Many are available under the National Health Service and the others may be purchased privately. Each hospital has its own arrangements for fitting patients with prostheses and brassieres. A list of shops in Belfast providing these facilities is included in the booklet.

The co-ordinator regularly gives talks to student nurses in hospital at Royal College of Nursing refresher courses, to health visitors and to groups of selected medical students.

A meeting of mastectomy associations in Europe was held in Copenhagen in May 1980. One of our volunteers and a Belfast surgeon were invited to read papers. It was obvious from reaction at the meeting that the service provided in Northern Ireland is the best in Europe.

DISCUSSION

It is now obvious that this is the most valuable of all the services offered by the Ulster Cancer Foundation. When the author was collecting data to present to Council for consideration to establish this service he was amazed at the lack of follow-up care these patients received.

One startling discovery was that the majority of ward sisters in female surgical wards outside Belfast had not trained in one of the City hospitals. Therefore, many were unable to advise patients about the location of Belvoir Park Hospital, visiting facilities, etc. Many did not know what treatment in that hospital entailed. The surgeon usually left all this work to the ward sister !

One lady wrote to say that she had had a mastectomy performed in 1950 and that for 25 years she used a bag of birdseed to fill her bra ! She is now an enthusiastic supporter of this organisation. Another lady wrote to describe her first treatment in the radiotherapy ncetre. She was in a 'strange' hospital. Many of the patients in her 'home' hospital were neighbours and friends. She became quite terrified when she found herself alone in the treatment room despite all the reassurances that she had been given by the staff in the department. Another lady had been distressed when she had been told never to sunbathe as the treated area would be damaged by sunlight ! A continental holiday planned to aid convalescence had to be cancelled.

The psychological aspect of the mastectomy operation had also been largely ignored. Some women wrote to say that they felt to be only half a woman. They wondered what would be their husband's feeling for them. They did not know how to talk to their children, especially their daughters. The modern mastectomy operation is not physically incapacitating but often it is mentally incapacitating. If a woman is going to regain her confidence she must come out of hospital feeling and looking as normal as possible.

Many women have reported that the 'fitters' of bras and prostheses carry a poor selection of sizes and cups and that the actual fitting of the garments leaves a lot to be desired. The 'fitters' appear to hurry away from them. Is this a genuine complaint or is it a fear on the part of the fitter that she may get the disease? This is a major problem for our clients. It is gradually being overcome by inviting fitters to attend some of our meetings. Indeed, everyone, fitters, surgeons, doctors and nurses who have attended the meetings of volunteers have assured me that they learned from the volunteers instead of teaching them !

Unfortunately, some of the volunteers developed carcinoma in the remaining breast. They have not been asked to advise anyone until 2½ years have elapsed and are only asked to see other women who are having the second breast removed. A few have died. Because of the attitude of positive living instilled into all our staff, these deaths did not have a long lasting effect on the other women. We have restricted the number of volunteers to approximately thirty so that they can be well trained and later acquire a wide experience in visiting clients. Too many volunteers would reduce the amount of experience available to each.

Since 1975 over seven hundred requests have been received for help — over two hundred of these being in the present year. Recently one has been heartened by the number of requests from health visitors, social workers, psychiatrists, family doctors and community nurses. We had concentrated all our efforts in the hospital service. This new development is welcome. Much work has yet to be done in advising doctors, nurses, families and, indeed, the women who develop this all too common disease.

SUMMARY

The need for an advice service to patients who have a mastectomy is noted. The non-medical problems that they encounter have been discussed. A group of women who have had the operation have been trained to advise these patients in hospital and at home. A "Mastectomy Centre" has been established to co-ordinate the service and to organise displays of prostheses, clothes etc., and to supply appropriate literature. The demand for this service is increasing annually.

ACKNOWLEDGMENTS

The outstanding success of this organisation is entirely due to its first co-ordinator, Miss Betty McCrum, to whow I am deeply grateful. I also wish to

thank the Council of the Ulster Cancer Foundation who have made funds available for this service and to the Director, Mr Wood, and the other officials in the Foundation who helped most willingly.

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LUMBER RADICULOGRAPHY IN INVESTIGATION OF LOW BACK PAIN

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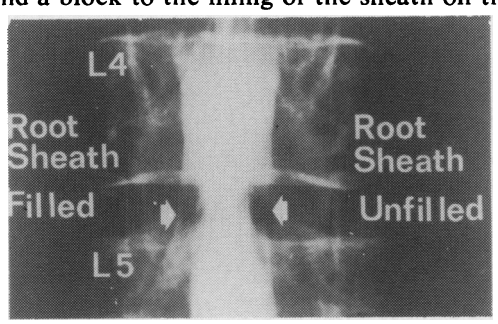
INTRODUCTION

MYELOGRAPHY with water-soluble contrast media to establish the diagnosis of prolapsed intervertebral discs is an established part of orthopaedic practice. The perfect myelographic contrast medium has not yet been developed. Ideally, it would be free of complications, be absorbed quickly from the CSF, and give a high diagnostic accuracy.

The first agent to be used in Musgrave Park Hospital was iophendylate (Myodil), introduced in the early nineteen fifties. This was a viscous, oil-soluble, iodinated material which could be used throughout the subarachnoid space. Its disadvantages were that it was absorbed only very slowly and could cause chronic arachnoiditis. It was immiscible with C S F and could not, therefore, outline nerve root sheaths. Halliday[1], reporting on the diagnostic accuracy of Myodil in clinically atypical disc protrusions, found that only 63 per cent of myelograms showing a definite or probable prolapse were correct. He noted also a significant number of false negative examinations and he concluded that Myodil myelography gave only limited assistance in the diagnosis of clinically doubtful prolapsed lumbar discs.

In search of a more accurate agent, Myodil was replaced by the water-soluble agent, meglumine iocarmate (Dimer-X) in 1974. Water-soluble agents had first been introduced in 1931 but the early materials were highly irritating and could not be allowed to come into contact with the spinal cord. Dimer-X gave a high diagnostic accuracy rate by producing excellent visualization of the lumbo-sacral nerve roots and leading to the use of the term radiculography. Pressure on a nerve root due to disc prolapse leads to lack of filling of the root sleeve which is easily seen on the radiculogram. The figure illustrates a root sheath filling on the right side at L.4/5 and a block to the filling of the sheath on the left side at L.4/5.



Filling of root sheath on right side at L4/5 and block to filling on left side at L4/5

Dimer-X had, however, certain adverse side effects. Headache was often severe but the most serious complication was epileptiform seizures. During one such Dimer-X induced attack, a patient sustained a central fracture/dislocation of the hip due to myoclonic spasms. A similar case has been reported[2]. Following this alarming complication, the use of Dimer-X was discontinued in Musgrave Park Hospital and replaced by metrizamide (Amipaque) in 1978. Metrizamide is a water-soluble, iodinated, non-ionic contrast medium, first introduced by Nyegaard and Company of Oslo in 1972. It has a low osmolality and is isotonic with CSF. Early reports were encouraging of a high diagnostic accuracy with low neurotoxicity.

The purpose of this paper is to report our experiences with metrizamide in 419 patients with particular reference to the operative correlation with the radiculogram result and to the complication rate.

METHOD

The records of 419 patients undergoing Amipaque radiculography during the period March 1978 till July 1979 were examined retrospectively — 422 radiculograms were performed, three patients having repeat examinations following technical failures.

The indications for myelography included: —

(a) Symptoms of low back pain with or without sciatica, unrelieved by a period of conservative treatment which usually consisted of pelvic traction.

(b) Neurological signs present after conservative therapy — e.g., reduced straight leg raising, absent reflexes or weakness of muscle groups.

(c) Signs of acute foot drop or urinary retention — demanding emergency radiculogram.

There were 243 males and 176 females with an age range of 15 to 73 years and a mean of 41 years. The patients with sciatica numbered 397 and 22 had backache alone.

The radiculograms were performed following standard lumbar puncture at the L.3/4 level with the patient either sitting up or in the left lateral position. The metrizamide solution was prepared by injecting bicarbonate buffer solvent into the vital containing freeze-dried, powdered metrizamide. Following withdrawal of a sample of C S F for routine laboratory examination, the metrizamide solution was injected into the subarachnoid space. Standard AP, cross-table lateral and right and left oblique films were taken immediately on a tilting x-ray table.

The radiculograms were reported on by one of two radiologists and their reports were graded into four groups —

1. Positive — showing definite filling defect, thought to be due to prolapsed disc. Other pathology producing a similar radiological picture — e.g., nerve tumours, scarring from previous infection and congenital or acquired bony abnormalities — have to be borne in mind.
2. Negative — no abnormality detected.

3. Equivocal — showing a slight abnormality of the contrast column, indicating a possible prolapse.

4. Technical failure — due to the contrast material being wholly or partially outside the subarachnoid space.

RESULTS

Of the 419 patients, 224 underwent operation within one month of the investigation and these allowed assessment of the accuracy of the radiculograms. Of the operations performed on the 188 patients with positive reports, 171 were confirmed as having a prolapsed disc at the level suggested, an accuracy rate of 91 per cent. In one case, the radiculogram showed a complete block at L1 in a patient with a kyphus at this level, due to tuberculous scarring. Fifteen cases (7.5 per cent) were deemed by the surgeon as not showing prolapsed discs at the level indicated. These can be called false positive results. Alternative explanation for most of these cases was possible and this will be discussed later.

There were twelve wrong level diagnoses — that is, the surgeon diagnosed a prolapsed disc at a different level from that suggested by the radiculogram. Of the nine double-level reports, seven subsequently had surgery. In three of these cases, prolapsed discs were diagnosed at both levels and, in the remaining four, one level was confirmed. In one case of an L.5/S.1 positive report, the surgeon considered both L.4/5 and L.5/S.1 discs to be abnormal.

Of the twelve negative results, ten were confirmed as being negative and, in two, prolapsed discs were removed. Thus, there were two false negative results but, as there were only twelve patients with negative reports operated upon, these numbers are too small to attach much significance to them.

Of the twenty-two equivocal results, only seven were confirmed as showing abnormal discs at the level suggested and one of these was at a different level. Twelve were considered normal, two doubtfully abnormal discs were removed and, in one case, a spinal fusion was performed without inspecting the disc spaces.

There were 198 patients who did not have surgery within one month of the radiculogram, some may have had surgery several months later but these patients are not included in this series. It is interesting to note that 53 patients with radiologically confirmed disc prolapses and 54 with equivocal findings did not require immediate surgery on clinical grounds.

Three hundred and twelve patients (74 per cent) had no recorded complications following radiculography. One hundred and ten patients (26 per cent) did have complications, the most common of which was headache and these are listed in the Table. There were no serious adverse reactions.

TABLE

COMPLICATIONS IN 422 RADICULOGRAMS

52	Headache alone.	1	Headache, dizziness and blurred vision.
40	Headache and nausea/vomiting.	1	Headache and insomnia.
8	Nausea and vomiting.	1	Headache and neck stiffness
2	Headache and dizziness.	1	Headache and photophobia.
2	Hot and clammy.	1	Neck stiffness.
1	Blurred vision.		

TOTAL 110 (26%)

DISCUSSION

The radiological diagnosis of prolapsed lumbar intervertebral discs was confirmed at operation in 91 per cent of cases. If one also takes into consideration the operative confirmation of the negative radiculograms, then the overall accuracy of radiculography, excluding the equivocals, is 90.5 per cent.

A certain number of positive radiculograms were not confirmed surgically as being due to prolapsed discs. In this series, there were fifteen out of 188 (8 per cent) false positive examinations. There were reasons for twelve of these reports — five of them being due to the presence of arthritic changes in the lumbar spine. Of the others, two each had previous surgery and spondylolisthesis and one each had a tumour, a bony ridge or an abnormal ligamentum flavum. In only three was no cause for error found. Especially if these complicating conditions are excluded, the study confirms the high diagnostic accuracy of metrizamide radiculography and corresponds favourably with the experiences of others [3] [4].

Another important point to come out of these results is the high number of patients (53) with positive radiculograms upon whom operations were not immediately carried out. The main reason for this was that the clinical signs had settled and it was felt by the surgeon that operation was not indicated in spite of the report. Some of these patients may well have had subsequent surgery but have not been included in a prolonged follow-up in this study.

Radiculography is not of great help when the surgeon is presented with an equivocal report. Of the twenty-two equivocal results who had surgery, half were normal and one third were abnormal. Thus, a surgeon operating on a patient with sciatica who has had an equivocal radiculogram is not certain of finding a prolapsed disc.

It would seem unwise to operate on a patient who has had a negative radiculogram in the hope of finding a prolapsed disc as the cause of his symptoms. Of eighty-six negative examinations, only twelve had surgery and ten of these had normal discs. Two false negative examinations out of twelve is too small a number to be of statistical significance.

Surprisingly, there were twelve wrong level diagnoses in which the surgeon diagnosed a disc at a different level from that suggested by the radiculogram. Either the surgeon was mistaken in his levels — perhaps due to some anatomical

abnormality, e.g., sacralisation of the fifth lumbar verterbra, or the radiculogram was wrong — not once but twice, with a false negative at one level and a false positive at the other. In view of the already established high accuracy of metrizamide, we believe the former explanation to be the more likely. One way of reducing the likelihood of operating on the wrong level is by use of a marker x-ray. This is a technique in which a radio-opaque material such as a coin is placed over the lower lumbar vertebrae and a standard lateral x-ray, with the patient in the flexed position, is taken before operation. On the x-ray, the coin is seen to be opposite a particular vertebra and the position is marked by a scratch on the skin. This is an additional aid to identify the level at which the surgeon is operating.

There were nineteen technical failures (4.5 per cent) due to failure to enter the subarachnoid space or the presence of the contrast medium outside the dura. This is half the failure rate when compared with Halliday's results of 1969, in the same hospital. Most of the injections were performed by junior staff in training, some of whom were doing lumbar punctures for the first time. We feel that, with practice, this rate can be lowered even further.

Just over one quarter of our patients had complications (Table 1). This is considerably lower than the 34 per cent[5] or the 43 per cent[4] reported. The presence of adverse reaction has, in the past, been the limiting factor in the use of other water-soluble agents and was the reason for discontinuing Dimer-X examinations in Musgrave Park Hospital. There were no serious complications in this metrizamide series. Headache was the most common and troublesome reaction. It must be remembered that headache follows lumbar puncture alone without the injection of noxious agents into the C S F in approximately 33 per cent of cases[6]. We cannot, therefore, say conclusively that the headaches observed were due to chemical irritation of the meninges by metrizamide. Some of the headaches recorded in our series were so severe and prolonged that several patients admitted that they would never subject themselves to the experience again. Nausea and vomiting, present in eight patients, was often troublesome for up to 48 hours.

No myoclonic spasms or convulsions occurred in this series but have done so in other instances[7], and are more likely following cervical examination. One reason for the low neurotoxicity is apparently related to the low osmolality of metrizamide[4]. We must take steps to reduce the incidence of this complication. It is known that phenothiazines can provoke epileptiform activity on the E E G and act synergistically with metrizamide to produce epileptic seizures[8]. Any patient taking these drugs must have them discontinued before undergoing radiculography. Premedication with diazepam has apparantly lowered the convulsion rate[8]. Though most of the examinations in our series were carried out without prior administration of diazepam, it would be reasonable to prescribe it before and after puncture in an attempt to prevent convulsions. It has also been the practice in Musgrave Park Hospital to keep the head of the bed tilted up at

30° for twenty-four hours following examination, to avoid the contrast medium coming into contact with the central nervous system. It is hoped that attention to these points will reduce the risk of convulsions occurring.

SUMMARY

The accuracy of metrizamide contrast medium in diagnostic lumbar radiculography was assessed on 224 patients who had surgical treatment for low back pain and sciatica. Of 188 with positive reports, the diagnosis was accurate in 91 per cent, the complication rate was low and there were no serious adverse reactions.

Metrizamide is an accurate and safe medium for use in diagnostic radiculography and its use is recommended in all patients in whom disc surgery is contemplated.

We would like to acknowledge the help of the orthopaedic consultants of Musgrave Park Hospital who allowed us to study patients under their care. Our thanks are also due to Dr. R. S. Crone, Mrs. Ann Ross and the staff of the Radiology Department of Musgrave Park Hospital and to Miss Betty Beavis for her help in the preparation of this manuscript.

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GALILEO IN QUEEN'S

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THE University has lately taken into its care a piece of Florentine statuary. The statue of Galileo has been moved from the Ulster Museum to what, it is hoped, will be a permanent home in the Medical Biology Centre where it has been placed in a well-lit position at the north end of the front corridor. The statue was originally brought from Florence to Belfast by the late Professor Sir William Whitla and presented by him to the Ulster Medical Society in 1915.

Sir William is remembered as a generous benefactor of Queen's and of the medical profession in Ulster. He was an ardent traveller, visiting Russia, Palestine, Italy, France and Canada. During his travels he indulged his passion for collecting pictures and pieces of sculpture, among them the statue of Galileo which was too large to be placed in his house in Lennoxvale (now the residence of the President and Vice-Chancellor of Queen's) or in the Medical Institute in College Square North which he had presented to the Ulster Medical Society. The statue was then given a temporary home in the Belfast Public Library in Royal Avenue and was later taken to the new Museum and Art Gallery on Stranmillis Road.

The authorities of the museum, having given lodging to the statue for 65 years, desired to be relieved of it, and the Ulster Medical Society turned to the University for assistance, with the gratifying result that the Galileo has now been housed on the Queen's campus.

The sculptor was Pio Fedi, one of the most distinguished of the Florentine sculptors of the 19th century. Some of his work is still displayed in the main square of Florence amongst statues which are known the world over. The following account of it appeared in the *Transactions of the Ulster Medical Society* in 1915. The writer's name is not given.

"A colossal statue in Carrara marble. The celebrated astronomer is represented in the prison of the Inquisition sitting on a stool; a map of the world and rolls of paper lie on the ground. The right leg is extended, and the left is bent. The right hand rests on the knee, on which is unrolled an astronomical map. The other hand supports his chin in a thoughtful attitude. A long beard falls on his breast. The brows are knitted, and the face wrinkled. He is completely absorbed in the working out of some new problem, or perhaps he is thinking of his famous dilemma, "Eppur si muove" ('It moves for all that').

The work was intended for the monumental cemetery at Pisa. The author was so fond of his work that he did not wish anyone to touch it. He himself rough-hewed the block and carried it out to the end without adding anything thereto.

Pio Fedi loved his art and cultivated it with the passion of the ancients; he took the subjects of his works from classical sources thus drawing his inspiration from the actual font of eternal beauty.

To this artist has been granted in his lifetime one of the greatest of honours — one of his works, "L'Enlevement de Polyxene", has been purchased by public

subscription raised by the Florentines, and has been placed beneath the roof of the Orcagna where it represents modern art side by side with the immortal works of Benvenuto Cellini, Donatello and Jean Bologna in what the Florentines consider to be the most beautiful portico in the world and the monument capital of the history of art".

His Dante group is in the Pitti, and other works of his are met with in various galleries and public squares in Italy.

That it is a faithful portrait of Galileo is vouched for by the fact that the sculptor copied the death mask of the great scientist which is still preserved in the Florentine Museum".

Since Galileo was a physicist and astronomer his statue some might say would be more appropriately housed among physicists than anatomists and physiologists. However, it was as a medical student that he began his university training and he is again among medical students. In addition, the Whitla Medical Building which both commemorates the donor of the statue and (by courtesy of the university) provides accommodation for the Ulster Medical Society is virtually an integral part of the Medical Biology Centre. The new location of the Galileo is therefore entirely appropriate.

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TERMINAL CARE

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INTRODUCTION

AS the Journal of the Royal College of General Practitioners[1] rightly points out, the dead cannot complain, the bereaved seldom do so and where the dying are concerned there is no possibility of trying harder next time. While the patient requiring terminal care is often thought of as one dying with a painful malignancy, it is important not to forget patients in terminal phases of cardiovascular, cerebrovascular, neurological or respiratory illness and to remember children with, for example, spina bifida, cystic fibrosis and muscular dystrophy who now live much longer than formerly. Terminal care, by definition then, refers to the care of a patient whose treatment, following accurate diagnosis of his illness, becomes palliative rather than curative and who is expected to die within a time which is usually less than a year, but may range from a few days to a few years. These patients and their families require very special support which involves not only high quality nursing but also explanation and counselling, help with spiritual and social problems, palliation of physical ailments and the use of other methods of enhancing the quality of life such as physiotherapy and occupational or recreational therapy. Alleviation of the worst miseries of the dying patient and his family is not dependent upon new buildings nor expensive equipment but depends primarily upon enlightened professional attitudes and doctors have a very definite responsibility to endeavour to acquire these.

OBJECTIVE

The objective of a physician involved in terminal care should be to create an environment in which the patient can receive relief from physical and emotional suffering throughout his illness. The patient should have access to professional staff who can help him to meet death in comfort and with dignity by removing or alleviating unpleasant symptoms and preventing him from experiencing fear or loneliness. There are thus three main areas to consider in planning a practical approach towards meeting these objectives. These concern (1) the environment; (2) relief of physical symptoms and (3) relief of emotional suffering.

The Environment

The locations in which terminal care may be provided are the home, hospital and hospice. Social changes over the past years have affected the pattern of dying. Family units have become smaller and more women go to work outside the home. Therefore, as older family members quickly become physically tired and younger people may have other responsibilities, help may not be readily available for the patient in the home. However, should the patient wish to stay at home the practical aspects of assistance from nurses, social services, voluntary services and sources of

financial aid should be considered carefully. Aids to nursing in the home, for example, a fan, commode, bed rest, deodorizer and night sitting and laundry services should quickly be made available.

A study done in Belfast in 1979 revealed that almost 60 per cent of all deaths now occur in hospital.[2] Twenty five per cent occur suddenly and only 11 per cent of deaths occur at home following a period of terminal care. Many patients are admitted to hospital just a few days before their death. Since so many people feel that the ideal death is to die peacefully in one's own bed, why should this be so? It may result from insufficient help being available at home so that 24 hour nursing care eventually becomes impossible. Relatives may lack or lose confidence in coping as the personal needs of the patient increase. Another reason may be that the disinclination of the patient or family to accept the imminence of death may leave them unprepared for the final deterioration. The family may be unable to cope with anxiety regarding administration of medication, being alone at the time of death, how best to help the patient and what to do after death. They may be anxious that help from a known and trusted doctor or nurse may not be immediately available when needed. Recognizing such possibilities, appropriate action must be taken to minimize these anxieties.

In hospital these patients may feel neglected because of the pressing demands of other acutely ill patients and, indeed, staff may be glad of excuses to avoid spending time with the terminally ill, especially if they feel ill-equipped to cope with the patient's emotional needs. However, in hospitals where staff are concerned and knowledgeable about the treatment of the terminally ill this need not arise. Should patients then need to be readmitted when home management is no longer possible they return to a familiar and caring setting where they may feel quite happily secure.

The third possible environment is that of a hospice or terminal care unit where skills of specialists may help in achieving good control of symptoms. Here patients may be seen on an outpatient or day centre basis or may be short-stay or long-stay inpatients. In some cases the unit may send staff to visit the patient at home or to work in conjunction with the primary care team. However, some regard admission or referral to such a unit with great distress and there are disadvantages in detaching the dying from the rest of the community. The success of such units is based upon the skill and high level of commitment of the staff. There are usually religious services held in these units for those who wish to attend but pressure is never put upon patients to alter their beliefs. A psychiatrist is often available to both patients and staff and may be called upon to help staff members who feel distress, anger or dislike of patients and their illnesses and then undergo feelings of guilt. Close contact with the clergy associated with these units in spiritual counselling is also of great practical value.

In deciding upon the environment in which terminal care should be provided many factors must be considered. There are benefits in involving the family in the care of the patient. Helping with routine tasks can increase and improve family communication and mutual support. It is often a comfort after death for them to know that they have helped the patient as much as possible during the illness. Obviously it is easier for them to help in their own home and adequate nursing resources should be provided to assist them. Day care centres may be a useful means of allowing the family a break from an intense situation and hospital sources can

provide expert advice on pain relief and control of other symptoms. The best environment for terminal care must thus depend upon individual needs, wishes and the facilities available. Every circumstance has its own problem to be solved and it is important that staff involved should have an understanding of the problems, an adequate level of knowledge, reasonable resources to work with and a positive attitude towards achieving the best results for each individual. To do so to the best advantage needs good and clear communication between all members of staff.

For the future, an integrated system with co-ordination between primary care, hospital and hospice sectors should be the goal. Hospices, with their specialist experience, should continue to be initiators of new approaches to symptom relief and centres for research rather than merely providing beds for dying patients. Local needs should be considered in the planning of care. More special unit or hospital care is likely to be needed in larger towns and cities where transport is relatively easy but homes and families tend to be smaller. In rural areas with stronger family ties and greater difficulties in travelling a stronger emphasis will be placed on care at home.

Relief of Physical Symptoms

Of all factors in terminal illness pain is one of the major problems requiring relief. The intensity of pain is closely related to its cause and the interpretation placed upon it by the patient. For example, pain experienced in a short-term illness and readily understood differs considerably from chronic pain which often lacks obvious meaning for the patient but which may invoke the possible threat of admission to hospital, the need of surgery, permanent disablement or death itself. Pain, such as that of metastases in bone or affecting a nerve root, alters the patient's social and interpersonal relationships and his ability to live a normal life. It may isolate him from the world around. It may also affect his finances for it may be the factor which prevents him from continuing in paid employment. Pain is potentiated by fear and tension and these are great antagonists to analgesia.

Physical pain will be alleviated most effectively in an atmosphere which provides some security for the patient and family. With regard to pharmacological measures, the physician may use simple analgesia initially, such as paracetamol, dextropropoxyphene or dihydrocodeine, before progressing to the opiates to which the maxim "too little, too late" is often applied. These drugs should be introduced at a time which is not too late for them to be valuable and in a dosage which is sufficient to make the patient comfortable. Useful opiates are phenazocine, dipipanone, pethidine and Brompton Cocktail, which contains cocaine and diamorphine in an alcohol base. A useful adjunct to these analgesics is chlorpromazine which sedates, helps nausea and potentiates analgesia. Non-steroid anti-inflammatory drugs, such as indomethacin, are also useful, especially in controlling nerve pain.

Principles applying to the use of analgesics are that they should be administered on a prophylactic basis, given three to four hourly, rather than waiting to palliate pain when present. They should be given orally for as long as possible but the rectal route should not be forgotten since many are available in the form of suppositories. When parenteral administration of an opiate analgesic is indicated this should not be withheld. Dosage must be sufficient to control symptoms but when physical relief is

obtained and the patient becomes comfortable it may then be possible to decrease the quantity of medication.

Cytotoxic drugs may also have a place in analgesia, as do physical methods such as nerve blocks and radiotherapy, particularly where pain is associated with spinal cord compression or bowel, bladder or uterine haemorrhage. Both infection and hypercalcaemia are known to exacerbate pain and these conditions should be actively sought and appropriately treated.

Eating and drinking are everyday activities which become major problems if nausea or vomiting is present. Cyclizine provides effective relief from these symptoms and the painful colic associated with obstructive vomiting may be relieved by a combination of diphenoxylate and atropine (Lomotil). Metoclopramide is less appropriate as an anti-emetic in terminal care since it is more liable to cause extrapyramidal reactions in the dehydrated patient. Anorexia may respond to the tasteful preparation and presentation of savoury foods which are usually more appetizing than sweet foods to those who are ill. If the patient has dysphagia this is sometimes alleviated by antacids. Careful attention to oral hygiene may prevent a sore tongue and nystatin preparations are useful if candida infection develops on the tongue or oral mucosa. The simple measure of offering ice to suck will relieve the dry mouth which is a common symptom of dehydration. Another major physical problem requiring relief is insomnia, often alleviated by chloral hydrate or diazepam. However, sleeplessness is often associated with depression which may require treatment with antidepressant drugs such as amitriptyline. Cerebral **metastases can produce dementia or delirium which may respond dramatically to dexamethasone.**

With decreasing mobility and increasing analgesic intake, constipation becomes a common complaint requiring treatment with suppositories or oral laxatives. Diarrhoea is sometimes another problem in terminal illness and when spurious diarrhoea, secondary to faecal impaction, has been excluded, kaolin preparations are useful remedies. The discomfort of either bowel or bladder incontinence should be minimized by the provision of absorptive pads and waterproof sheets but may eventually require further attention such as urinary catheterization. A laundry service is an invaluable aid to both patient and family in such situations.

Dyspnoea is a most distressing symptom which may be alleviated by oral salbutamol or by aminophylline suppositories and the patient may feel less distressed if oxygen is available. However, it may be necessary to tap pleural effusions in order to relieve respiratory embarrassment. Other disturbing symptoms are a chronic hiccough, which often responds to chlorpromazine, and a chronic itch from which relief may be obtained by antihistamines.

Fungating growths and pressure sores require frequent dressings and it is both kind and useful to protect the patient from the unpleasant odour of such lesions by using a deodorizer. Instruction of the family in good nursing care and the provision of sheepskin pads are valuable in avoiding physical suffering for the patient.

Relief of Emotional Suffering

In considering the total care of the terminally ill the provision of emotional relief must not be forgotten. Physical pain and its treatment have been considered but

there are other facets to pain. Emotional distress can be a real problem if the patient feels rejected by society. This may occur if the patient's appearance has changed. For example, he may have developed a large growth on his face or may have undergone mutilating surgery. A woman may feel that her personality has been altered and her femininity compromised after a mastectomy or hysterectomy. Emotional distress may be intense when a patient has to forfeit independence and accept weakness and dependence on others. There is emotional stress in adjusting to a new social situation such as hospital where all personal privacy may be lost. Patients may feel isolated if surrounded by staff who do not have confidence to face the problems of a dying patient and who lack understanding of ways to help overcome these problems. All staff involved in terminal care require instruction in counselling techniques and need to be able to cope with their own reactions to death in order to provide support. Time should be taken to talk with patients about daily happenings and their immediate interests. Existing social contacts should be maintained and, if necessary, new ones encouraged.

Problems may be prevented if information is effectively communicated and this should be given in a kindly, optimistic and simple way that is still recognizable as the truth. As the illness progresses the patient may wish to know more about his condition and past lies only serve to create barriers and promote anxiety. The doctor should understand that the patient will not immediately be able to accept that he has a terminal illness and that he has to go through a series of stages in acceptance. Firstly, there is a stage of denial, either verbal or manifest in behaviour. Secondly, there will be a stage of anger asking "why me?", or blaming someone for not detecting this diagnosis at an earlier stage. Doctors must be aware of the reason for this hostile behaviour and not aggravate it. Thirdly, patients go through a stage of bargaining, trying to "buy off" the disease. Most bargains are kept as secrets between the patient and God but by being aware of this it may be possible to discover and alleviate irrational fears or guilt. Fourthly, the patient may become depressed when the truth can no longer be avoided and though he may mask this with superficial cheerfulness antidepressant medication in addition to counselling may be required to overcome this depression. In time further discussion will lead to a final stage of acceptance in which the patient is quiet and sleeps a lot, often just preceding his death. Throughout these stages it should be remembered that the knowledge that someone cares and is ready to share concern may well be much more important than details about diagnosis and prognosis.

After giving relatives news that the patient has a terminal illness they should be given the opportunity to ask questions and a second interview, after the impact of the news has been absorbed, should be arranged. In talking with relatives lack of information may cause uncertainity and nurture anxiety or bitterness. The whole programme of terminal care is much easier for everyone in a family who see God as the God of life and death and who regard death as a continuum of living. But even here help should be offered to enable the bereaved to adjust to their separation from their loved one. Relatives need advice and support before and after the patient's death, for death is not the end of professional responsibility to the family. Remembering this is good preventative medicine in combating subsequent pathological grief reactions.

CONCLUSION

The effectiveness of the care of the patient in his terminal illness depends on the efficiency of the primary care team. The general practitioner must supervise treatment at home, organizing 24 hour cover which reassures the family that trusted help will always be available. He should have a plan of care knowing where the hospital or hospice may provide useful services and knowing that there will be good communication between these sectors and the primary care team. He should also provide drugs as necessary to alleviate symptoms and should ensure the availability of adequate aids for home nursing by enlisting the help of voluntary and social services as appropriate. The Health Visitor should particularly be involved in the care of the elderly and of children. Such services as domicilary chiropody, physiotherapy or occupational therapy may enhance the patient's comfort, although these are not available in all areas. The place of a spiritual counsellor is of great practical value and his involvement must not be forgotten. Prior to the patient's death visits should be as frequent as necessary to ensure that effective care is taking place and after death relatives should also be visited to enable them to share their grief and then continue to live in a state of mental and physical health.

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ACKNOWLEDGEMENTS

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BOOK REVIEWS

SYMPOSIUM ON NUTRITION. Edited by S.H. Davies. (Pp 123. Price not stated). Edinburgh: Royal College of Physicians, 1980.

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THOSE who work in accident and emergency departments are exposed to particular risks in the medico-legal field. They are usually offered advice either from lawyers, who know what the law is but do not fully appreciate why a doctor feels impelled to act as he does, or from doctors who do understand, but whose grasp of the law is less than perfect. The great advantage of this book is that the author is both lawyer and doctor. He is the emergency physician in charge of the Emergency Room of Underwood Memorial Hospital, Woodbury, a Member of the Bar of New Jersey, Kentucky and Editor of "Emergency Physician Legal Bulletin".

The book is American, and therefore based on American law and written from a more aggressively litigious situation than our own. Not everything is directly applicable to a United Kingdom situation. However, the fundamental basis of the law relating to negligence, confidentiality and such matters does not vary.

The least relevant chapter is probably that on Good Samaritan laws. I do not know of any strictly comparable law here. The chapter on the legal risks of the Emergency Medical Technician (the paramedic or up-graded ambulance man) is a warning of what may happen here if workers of this grade are introduced. That does not prove that such grades are inappropriate, it merely highlights one possible accompanying complication. The other 13 chapters are all concerned with such matters as consent to treatment, the medical record, child abuse, rape and psychiatric emergencies.

The writing is lucid and commendably free of jargon. In spite of the American setting I think it is a book well worth having in the Accident and Emergency Library in departments in the United Kingdom.

W.H.R.

REVIEW OF NEUROSCIENCE. By Ben Pansky and Delmas J. Allen. (Pp 622, Figs over 1000. £11.00). London: Bailliere Tindall, 1980.

THIS book follows a current trend, particularly prevalent in America in the last ten years, in that various topics are presented in a multidisciplinary manner relating normal and abnormal structure and function. This educational concept is in some ways good, especially for a complicated system such as the nervous system, and Review of Neuroscience provides a great deal of information in this way. As with all multidisciplinary presentation it fails, however, in that total correlation is impossible and in fact the reader is presented with a series of chapters on embryology, anatomy, neurophysiology, clinical neurology, and neuropathology rather than with a truly integrated presentation. Nevertheless, the information provided is useful and the diagrams are excellent. It is doubtful, however, if the student approaching neuroscience for the first time would find this the easiest book from which to learn. It is probably better to approach the subject conventionally through the established texts on embryology, anatomy, physiology, etc. Nevertheless for those who wish to revise topics quickly and easily, this is a most useful volume and of particular use to the clinician and to the neuropathologist. I.V.A.

CLINICAL CANCER MEDICINE: TREATMENT TACTICS. Edited by Jacob J. Lokich, M.D. (Pp 422, Illustrated. £19.95). Lancaster, MTP Press, 1980.

WITH medical oncology becoming a more important sub-specialty this 400-page book is a valuable addition to the growing number of oncology textbooks. It is a simple, explicit, clinically oriented presentation of a multi-author work in which many of the contributions are excellent and up-to-date; for example, the chapter on hyperacalcaemia of malignancy and its treatment with Mithramycin and the chapter on the management of nutrition. It also includes useful references.

This text could be appreciated by undergraduates but is written in particular for physicians interested in oncology and postgraduates studying medical oncology.

The practical approach to the overall care of the patient, including the very important psychological aspect, is emphasised by the many clinical examples described throughout the book. Accompanying illustrations would have been more helpful in colour.

I found this book a very worthwhile presentation and an excellent reference.

Z.M. and W.S.L.

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CLINICAL CANCER MEDICINE: TREATMENT TACTICS. Edited by Jacob J. Lokich, M.D. (Pp 422, Illustrated. £19.95). Lancaster, MTP Press, 1980.

WITH medical oncology becoming a more important sub-specialty this 400-page book is a valuable addition to the growing number of oncology textbooks. It is a simple, explicit, clinically oriented presentation of a multi-author work in which many of the contributions are excellent and up-to-date; for example, the chapter on hyperacalcaemia of malignancy and its treatment with Mithramycin and the chapter on the management of nutrition. It also includes useful references.

This text could be appreciated by undergraduates but is written in particular for physicians interested in oncology and postgraduates studying medical oncology.

The practical approach to the overall care of the patient, including the very important psychological aspect, is emphasised by the many clinical examples described throughout the book. Accompanying illustrations would have been more helpful in colour.

I found this book a very worthwhile presentation and an excellent reference.

Z.M. and W.S.L.

LAW AND EMERGENCY CARE. By James E. George, M.D., J.D. (Pp ix + 283. £16.75). St. Louis: Mosby and London: YB Medical Publishers, 1980.

THOSE who work in accident and emergency departments are exposed to particular risks in the medico-legal field. They are usually offered advice either from lawyers, who know what the law is but do not fully appreciate why a doctor feels impelled to act as he does, or from doctors who do understand, but whose grasp of the law is less than perfect. The great advantage of this book is that the author is both lawyer and doctor. He is the emergency physician in charge of the Emergency Room of Underwood Memorial Hospital, Woodbury, a Member of the Bar of New Jersey, Kentucky and Editor of "Emergency Physician Legal Bulletin".

The book is American, and therefore based on American law and written from a more aggressively litigious situation than our own. Not everything is directly applicable to a United Kingdom situation. However, the fundamental basis of the law relating to negligence, confidentiality and such matters does not vary.

The least relevant chapter is probably that on Good Samaritan laws. I do not know of any strictly comparable law here. The chapter on the legal risks of the Emergency Medical Technician (the paramedic or up-graded ambulance man) is a warning of what may happen here if workers of this grade are introduced. That does not prove that such grades are inappropriate, it merely highlights one possible accompanying complication. The other 13 chapters are all concerned with such matters as consent to treatment, the medical record, child abuse, rape and psychiatric emergencies.

The writing is lucid and commendably free of jargon. In spite of the American setting I think it is a book well worth having in the Accident and Emergency Library in departments in the United Kingdom.

W.H.R.

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PHARMACOLOGY. By R.G. Penn. Third Edition. (Pp 320, Figs 22. £4.75). London: Bailliere Tindall, 1980.

THIS is the third edition of a small textbook of pharmacology and supercedes the previous edition which was published six years ago. There are four introductory chapters on "general pharmacology" followed by chapters which describe the effects of drugs on each body system. The chapters on general pharmacology contain insufficient information to be of value to students without reference to other textbooks; in particular the section on pharmacokinetics does not take into account the great advances in this subject in recent years and their importance in therapeutics. There is no mention of the value of the measurement of plasma drug concentrations. The chapters on systematic pharmacology contain much more useful information which is clearly presented but occasionally there is inadequate information about newer drugs, e.g., cimetidine and beta adrenoceptor blocking drugs. The effects of drugs in man is generally poorly described and the pharmacokinetics of drugs is rarely included. Although the therapeutic indications for the use of many of the drugs is mentioned, their use in the treatment of disease is not covered in sufficient detail to be of any real value. This book may be of value to pharmacy students although it may not contain sufficient information to be used as a single textbook. Although the author did not intend his book to be a "therapeutic handout", its appeal to medical students would have been considerably improved by increasing its content of clinical pharmacology. Consequently the book may be of little value to medical students except where pharmacology is taught and examined as a separate subject, or in conjunction with a textbook of clinical pharmacology or therapeutics.

The book could be improved by the inclusion at the end of each chapter of a bibliography as a guide to further reading. Although there is a list of reference books at the end of the book, this could have been supplemented by a statement that excellent reviews on many aspects of pharmacology appear in many specialist journals.

R.G.S.

LAWTON AND FOY'S TEXTBOOK FOR MEDICAL ASSISTANTS. By M. Murray Lawton, Donald F. Foy, Lowell I. Thomas and Victor Schramske. Fourth Edition. (Pp 460. £13.50). St. Louis, Toronto, London: The C.V. Mosby Company, 1980.

THIS lengthy book defines in detail the learning needs of a new type of health care professional in America, known as a Medical Assistant. The aim of training is clearly to enhance status. The individual meets the many needs of the busy clinician in his office setting. Like a chameleon the trained professional will act as nurse, counsellor, technician, receptionist and practice manager. The multipurpose role defined therein is at variance with specialisation and role differentiation within the well developed medical care team approach in the British National Health Service, also with its hierarchial system of control between different health and social workers. The detailed learning requirements in the clinical practice sections of the book would be more appropriate in Britain to the training programmes of doctors, nurses, or laboratory technicians. The chapters on business practices are relevant only in an American context. The book makes interesting reading in a cultural sense but there is little of practical value for the British reader. There is an associated Workbook for Medical Assistants by different authors, for use with it, which is reviewed separately.

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BASIC RESUSCITATION AND PRIMARY CARE. By F. Wilson and W.G. Park. (Pp x + 339, Illustrated. £8.95). Lancaster, Lancs: MTP Press, 1980.

THIS book is aimed at the newly qualified doctor with little or no practical experience in resuscitation, senior nursing personnel, staff starting work in wards, casualty departments, intensive care units and the potential anaesthetist embarking on a career in anaesthesia. It begins with a very basic concise summary of how to organise thought and action in the emergency situation and is thereafter divided into four sections dealing with: i) specific conditions requiring urgent or rapid recognition and treatment; ii) practical ventilation; iii) the heart and circulation in health and disease, and iv) pH and SI Units.

Despite its title, this book goes far beyond describing basic resuscitation—it is not a simple primer of emergency treatment. Many situations, however, are well covered in Section I where a comprehensive range of emergencies from cardiac arrest to endocrine problems, disorders of temperature regulation, pre-eclampsia and neonatal resuscitation are briefly discussed. It was good to note 'Patients requiring urgent pain relief' were included under this 'emergency' section. The sections on temperature disturbance and of control of hypertension were useful but the book suffers from the inclusion of many irritating statements, e.g. under the heading 'internal active rewarming' in the emergency situation (p. 41) one cannot be sure how often it would be useful to use a Water's canister device to help rewarm a patient, that droperidol is particularly useful in old confused patients (p. 56) or that following trauma, external blood loss is *less* common than internal bleeding (p. 74). In the section on poisonings (p. 34) including paraquet, no mention is made of the availability of a simple urine test or of blood sampling. Neither is there any mention of haemoperfusion and this would seem to be a major omission.

Under Indications for Ventilation—Pulmonary emergencies, on p. 63 'Adequate PO_2 levels are irrelevant' seems rather a sweeping and misleading statement to make to young and inexperienced staff. One would have thought that maintaining adequate PO_2 levels at all times was fundamental in a primary resuscitation handbook. However, the rest of this chapter is clearly and informatively written.

The dangers of placing a nasogastric tube in the trachea of an intubated patient are referred to more than once. In discussing the diagnosis of this error (p. 86) which they seem to think could be common, direct inspection of the larynx is not mentioned. This seems odd in a book written by anaesthetists.

Section II on 'Practical Ventilation' is very comprehensive. The technique of endotracheal intubation, design and construction of circuits, respiratory pathophysiology and the recognition and treatment of the obstructed airway are all covered clearly.

Section III on 'The Heart and Circulation in Health and Disease' provides a simple guide to basic physiology and then goes on to outline the principles of treatment of the shocked patient, estimation of blood loss and fluid replacement. There is also a clearly written explanation of central venous pressure measurement and a chapter on practical techniques—mostly concerning venepuncture of peripheral and central veins, but also describing arterial puncture.

The final section on 'pH and SI Units' ha a useful chapter on blood gas disturbances with a clinically useful guide to their interpretation (p. 318). The rest of this section on moles, pascals and joules under the heading 'SI Units used in Resuscitation' is interesting background reading rather than emergency medicine.

The book just fulfils its aims of providing basic information for nursing and very junior medical staff. The middle ground between a 'white-coat-pocket' aide-memoire and an authorative textbook is difficult to fill and the authors at times seem unhappy about the restrictions they have placed on themselves. £9.95 is expensive for a rapid guide but inexpensive for a major book.

E.McA. & J.W.D.

VASCULITIS. By Klaus Wolff and Richard K. Winkelmann. (Pp xiv + 338, Illustrated. £20.00). London: Lloyd-Luke Medical Books, 1980.

THIS book was based on the papers read at the Innsbruch Symposium in 1979 but, in addition, for completeness of presentation, several further chapters were written. Winkelmann's chapters on the classification of vasculitis are a model of clarity dealing with both clinical and pathological concepts. Other excellent chapters are on "Microbial Antigens in Vasculitis". Particularly interesting are accounts of rarer forms of vasculitis, lymphomatoid granulomatosis, livedoid vasculitis and eosinophilic cellulitis. This book is a 'must' for both clinicians and pathologists interested in this subject. J.A.W.

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EPIDURAL ANALGESIA IN OBSTETRICS—A Second Symposium. Edited by Andrew Doughty. (Pp xvi + 208, Illustrated. £7.50). London: Lloyd-Luke, 1980.

THIS book documents the evolution of the practice of extradural analgesia in obstetrics during the last decade. Its pre-runner, published in 1972, did much to add momentum to the growing demand for this form of pain relief for the parturient. Contributors include Bromage and Abouleish from the USA, Jousten, Fuster, Van Steinberge from Western Europe and Moir, Doughty and Crawford from the United Kingdom. The differing viewpoints of acknowledged experts regarding details of technique and clinical management are of great interest.

The book is subdivided into eight sections the first of which describes the initiation and maintenance of an epidural service. Medical staffing and the role of the midwife frequently presented difficulties and it is emphasised that close co-operation is essential if a safe and satisfactory service is to be established. The need for a resident anaesthetist, expert in resuscitation techniques, is stressed.

The sections on indications and fetal welfare suggest that this form of pain relief is applicable in almost every situation providing benefits for mother and infant. The paper presented by Thorburn and Moir dealing with severe pre-eclampsia indicates a need for caution as these authors suggest extradural analgesia may indeed be contraindicated in such circumstances.

Other sections deal with the choice of local anaesthetic, extradural management for Caesarean section and complications. Two deaths are mentioned and the importance of good organisation and strict constant medical supervision are stressed. The re-awakening of interest in the use of subarachnoid block in obstetrics is satisfied by a chapter on spinal anaesthesia.

This book is essential reading for all associated with the practice of extradural anaesthesia in obstetrics, be they obstetricians, anaesthetists or midwives. It is unique in that it is an appraisal of ten years' work and as such can only aid the advancement and interest in this form of pain relief. The editor, Andrew Doughty, has already made a very significant contribution to safe obstetric anaesthesia and we are again indebted to him for his work on this publication. At the price of £7.50 it represents excellent value.

J.M.

BODY TEMPERATURE CONTROL IN ANAESTHESIA, SURGERY AND INTENSIVE CARE. By Anita Holdcroft. (Pp 179, Figs 38. £8.50). London: Bailliere Tindall, 1980.

THIS book gives a most useful account of the process of temperature regulation in man and how it may be altered. Surprisingly few general accounts have been written on the subject since Cooper and Ross's monograph on Hypothermia in Surgical Practice (1960). Since this time hypothermia has become routine in open heart surgery and malignant hyperthermia has apeared virtually as a new disease.

The book starts by covering the physiology of heat gain and heat loss including such topics as acclimatization to heat, thermoregulation in the newborn and special problems in general medicine. The chapter on methods of temperature measurement is of special value to the anaesthetist preparing for the Primary FFARCS examination. It brings together not only the physics of the measurement but the relative value of the various bodily sites in which temperature can be measured. The section on drugs and body temperature includes the action of drugs in producing normo- or hypothermia and the effect of drug action, the best known of which is the effect on neuromuscular block.

Malignant hyperthermia may be rare but it is one of the most frightening emergencies that the anaethetist ever encounters. Research in Great Britain and the USA has produced much evidence as to its possible mechanisms and treatment. The effectiveness and ready availability of dantrolene makes the chapter on this disorder, by G.M. Hall, most timely.

The maintenance of body temperature and treatment of accidental hypothermia concerns physicians, paediatricians and those involved in intensive care generally. The chapter on this topic is practical and has a wide clinical application. Finally there is a chapter on the production of hypothermia and its physiological effects.

The book is attractively produced with up-to-date references and a useful appendix on correction for temperature of acid base data. As one who finds a small spaciously printed monograph easier to read than a section in a large text book I can heartily recommend it to all who wish to be brought up-to-date with this wide subject.

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PSYCHIATRIC ILLNESS. By H. Merskey. Third Edition. (Pp 434. £7.50). London: Bailliere Tindall, 1980.

THIS is the third edition of a successful introductory textbook of psychiatry. The approach is rather unusual in that the emphasis is on common psychiatric symptoms such as anxiety and clinical situations which create management problems such as the acutely disturbed patient. The process of diagnosis and management of such symptoms and situations is lucidly presented in a very readable style, which will make this book appealing to the non-specialist reader. The range of symptoms and clinical situations covered is wide and all of them are relevant to general medical practice. The chapter on personality disorder is disappointing. However, this difficult topic is rarely dealt with adequately in short textbooks of psychiatry. This third edition incorporates for the first time discussions of family therapy and cognitive therapy, information on drug treatment and legal matters relevant to conditions of practice in North America as well as the United Kingdom. There is an entirely new chapter on children and adolescence. A useful synopsis of all the common psychiatric syndromes is included in an appendix to the book. This textbook can be recommended as a useful introduction to psychiatry and will be especially useful for postgraduate students in training for general practice. G.W.F.

CURING AND CARING—A Review of the factors affecting the quality and acceptability of Health Care. By Allen D. Spiegel and Bernard H. Backhaut. (Pp xv + 261. £14.95). Lancaster, Lancs: MTP Press, 1980.

THIS hard-back by an Associate Professor of Preventive Medicine and an economist attempts to summarise the American literature written in the last 15 years pertaining to Curing which they refer to as 'the technology and science of the healing arts' i.e. the quality of health care and Caring, 'the art of medicine' i.e. the acceptability of health care to the consumer, the community and the provider.

If any medical readers were in doubt about the benefits of self assessment or audit before they read the section on Curing, I feel their apprehension would have disappeared having read the very comprehensive resumé of the evidence in favour of regular assessment, backed up by over 400 references.

The section on Caring is, as expected, much less technical and therefore easier to read—the chapters on the pros and cons of health education being particularly constructive.

The book should be valuable to committees formulating health policies in general, and community physicians in particular, despite its transatlantic orientation. J.R.McC.

THE PORPHYRIAS. Edited by A. Goldberg and M.R. Moore. Volume 9, Number 2 of Clinics in Haematology. (Pp vii + 225-450, Illustrated. £9.00). London, Philadelphia and Toronto: Saunders, 1980.

THE porphyrias—a group of diseases characterised by abnormal production and excretion of porphyrins have, since their definition in the early years of this century, attracted great clinical and biochemical interest and a voluminous literature. This recent edition of Clinics in Haematology is a very authoritative summary of our present understanding of these disorders. The opening chapter is a very lucid account of porphyrin metabolism in health and disease and is followed by descriptions of the different clinical varieties, namely hepatic and cutaneous porphyria, porphyria variegata and congenital porphyria. Of particular interest is the recent work on the mechanism of the photo sensitivity reaction so characteristic of cutaneous porphyria. Some years ago it was suggested that porphyria variegata could be regarded as the Royal Malady and that it had been present in the Houses of Stuart, Hanover and Prussia for some 400 years. However, strong arguments are put forward to challenge this deduction.

A chapter on porphyria in animals is followed by a very useful contribution on how patients suspected of having these disorders should be investigated.

Sections on the effect of drugs in hepatic porphyria and abnormal porphyria metabolism in diseases other than porphyria are also included.

This edition will serve as a most useful reference, but is unlikely to be read from cover to cover by any but the most dedicated biochemist. It is perhaps worthy of note that whilst the biochemical abnormalities in these patients has been defined in most elegant detail, this has not as yet been accompanied by any effective therapy. J.M.B.

HERITABLE FACTORS IN DISEASE. Royal College of Physicians of Edinburgh Publication No. 50. Edited by A. T. Proudfoot. (Pp 127; Illustrated). Edinburgh: Royal College of Physicians, 1979.

THIS book is the outcome of a symposium held on 1st and 2nd December 1977, at the Royal College of Physicians of Edinburgh. There is little doubt that genetic factors have become increasingly important in the aetiology of disease, and it has been estimated that some 5-7% of the population will suffer from a disorder with a genetic basis. The first five chapters of the book cover basic topics such as pattern of inheritance, sex-linked inheritance, multifactorial inheritance, genetic counselling, and prevention of disease. These are comprehensive and succinct. The chapter on multifactorial inheritance (D.S. Falconer) and on genetic counselling (A.E.H. Emery) are well written. The remaining six chapters are concerned with the genetic factors in diseases of gastrointestinal tract, skin, kidneys, and also the role of such factors in cancer, mental retardation and sexual differentiation. The chapter on genetics and cancer (D.G. Harnden) is concise and contains several useful tables.

Overall, the book does not contribute anything new and the reviewer considers that, as there are several recent books available in this field, the demand for this one will be limited. The editing is careless with frequent typing errors, e.g. p.72 "dsiorders", p.116 "antenantal", p.117 "religous", p.121 "non-steriodal". There are also errors of fact. For example, in discussing hydrocephalus and spina bifida, the author (J. Keith Brown) states "it can certainly occur in parent and child and in aunts, and is more common in inbred communities . . . . we do not know in fact whether the mode of transmission is most commonly autosomal recessive or autosomal dominant". I do not envisage this book having a wide circulation or being of value either to the student or the qualified doctor.

N.C.N.