VOLUME 42 WINTER 1973

# THE ULSTER MEDICAL JOURNAL

PUBLISHED BY
THE ULSTER MEDICAL SOCIETY

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# THE ULSTER MEDICAL JOURNAL

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2. Manuscripts should be typewritten with double spacing and with wide margins. They should be fully corrected, and contributors will be responsible for the payment of any sum charged for alterations in printer's proof in excess of 50p per sheet (16 pages).

3. References should be restricted to those really necessary, and useful and cited as in the publications of the British Medical Association and in most modern British journals. Either the full title of a journal or its correct abbreviation as given in *World List of Scientific Periodicals* or *World Medical Periodicals* should uniformly be employed.

4. Tables and illustrations should be reduced to a minimum, and should be sent detached from the typescript of the paper. Line drawings should be used whenever possible. All illustrations must be in a finished form ready for reproduction. Authors may be charged for all blocks at cost price.

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# THE ULSTER MEDICAL SOCIETY

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Dear Sir (or Madam),

If you are not a member of the Ulster Medical Society, we would appeal to you to give the question of joining your consideration. The Society has been in existence since 1862, and has always been active in keeping its members interested in the advances in medical science. Meetings are held at intervals of a fortnight during the winter months, and papers are contributed by members and distinguished guests. Facilities are provided for doctors to meet informally afterwards and have a cup of tea. *The Ulster Medical Journal, the official organ of the Society, is issued to all Fellows and Members free of charge.*

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We remain,

Yours faithfully,

J. A. McVICKER, *President.*
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*To* DR. N. C. NEVIN,
DEPARTMENT OF MEDICAL STATISTICS,
INSTITUTE OF CLINICAL SCIENCE,
GROSVENOR ROAD, BELFAST BT12 6BJ.

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*Name of Candidate* .....

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*Year of Qualification and Degrees* .....

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THE
ULSTER MEDICAL JOURNAL

PUBLISHED ON BEHALF OF THE ULSTER MEDICAL SOCIETY

VOLUME 42 WINTER 1973 No. 1

# FORTY YEARS ON

**J. A. McVICKER, O.B.E., M.B., B.Ch., F.R.C.G.P.**

Presidential Address to Ulster Medical Society, Session 1972–1973

FORTY YEARS AGO, this month, I started in practice, I confess without the benefit of vocational training; that came two months later when my chief had his first coronary. I was extremely fortunate in becoming assistant, and later partner, to John Taggart of the Antrim Road, one of the most distinguished practitioners of his day.

Taggart was a County Antrim man, with all the bluntness and sagacity characteristic of County Antrim men, yet full of compassion. He was respected and loved by his patients and held in the most friendly esteem by his colleagues and such men as R. J. Johnston, James Craig, Tommy Houston, Sam Irwin, W. W. D. Thomson, R. J. McConnell and many others. To many of you here tonight they are just names from the past, but I can assure you they were all eminent and distinguished doctors. As I worked with Taggart I soon found how these men admired him as a man and as a very competent physician. I am ever grateful for the four years during which I had the privilege of working with him, before his early death. What he taught me, in a very quiet way, more by example than precept, not only of medicine but also the right relationship with patients and the conduct of practice, has been of inestimable value to me during my professional life. I may say that all his colleagues continued to be most kind and helpful to me after his death.

I have been very lucky that during my time in practice, the rate of advance and progress in medicine, scientific, socialogical and organisational, has been much more rapid than ever before. The vast amount of new knowledge and methods which has come in the last 30 or 40 years is quite staggering.

In the ten years before I started in practice two great life saving discoveries had been made – insulin and the liver treatment of pernicious anaemia; and yet at

that time, I suppose we had only two drugs which might be termed chemotherapeutic agents – quinine for malaria, which I did not find to be prevalent in north Belfast, and arsenic for syphilis. Then in 1936 Prontosil was produced and rapidly followed by the other sulphonamides, including the famous M. & B. 693, which not only cured Winston Churchill of pneumonia, but also made a great many other people very sick during the therapeutic process. Today sulphonamides are not really very interesting or exciting drugs, except the new combination with trimethoprim, but at the time of which I speak they were quite revolutionary. To have means of actually curing infections due to streptococci, pneumococci and *B. coli* was unheard of. To be able to reassure the patient with pneumonia that he would be convalescent in a week or so, was very different from waiting for the famous crisis which usually came between the 7th and 9th day, if the patient was fortunate. To students and young doctors of today the anxious care which pneumonia used to require is unimaginable. We were literally helpless and could only hope that good nursing with supportive treatment and the patient's resistance would keep the pulse rate below the systolic pressure. Otherwise, we were taught, the prognosis was bad. Incidentally it is rather interesting that the incidence of typical lobar pneumonia today is very much lower than it was then. This may be due to the early exhibition of antibiotics in chest infection, where we still see many cases with a patch of consolidation, without much general upset.

In 1939 the War came and for a while life went on much as usual. A.R.P., later known as Civil Defence, was gradually organised with static and mobile First Aid Posts. The Emergency Medical Service deployed the hospitals for the many casualties which were expected. The Blood Transfusion Service intensified its work and built up its reserves. Very many doctors served with the Forces.

It was, as you know, not until 1941 that Belfast experienced its quite heavy, but few, air raids. As a consequence of these many people left the city and the work in the practice became very light. Thus I was able to undertake a part-time appointment with the mellifluous title of Liaison Medical Officer to the Belfast Civil Defence Authority.

Soon we began to hear of the wonders of penicillin, but of course all supplies were devoted to the Services. When the war was over supplies slowly increased, at very high prices, and again we were joyful that we could treat effectively many infections. Then came streptomycin and the attack on the tubercle bacillus was on. Soon, however, very severe side effects, notable intractable vertigo and deafness, appeared.

Perhaps the most agonising consultation which I can remember was with Fred Kane and the late Fred Allen. The patient, a little girl, the daughter of personal friends, presented with the symptoms and signs of meningitis. A lumbar puncture was done in the Clark Clinic. The pathologist reported that although tubercle had not been found, the fluid was otherwise consistent with tuberculous meningitis. The question was to give or not to give streptomycin; remember this was in its fairly early days. Its value in what had previously been a fatal disease was pointed out. The possible side effects were considered and all this was put to the parents. Ultimately it was decided to wait till the next morning. Happily by then the child had developed a parotid swelling, so the question of treatment was resolved.

We soon had the tetracyclines which had the great advantage in practice that they were active when taken orally. They were called the wonder drugs and indeed they seemed to be so. Please do not think that I am dramatising the point when I emphasise what the chemotherapeutic and antibiotic drugs meant to general practice. Before we had them in so many cases we could only exhibit masterly inactivity and simple supportive measures. Nevertheless we should remember today that many simple and minor infections are self-limiting. During the fifties many valuable drugs were added to our therapeutic armamentarium. The various ganglion blocking drugs gave hope for the treatment of hypertension, although in most cases the aetiology remained obscure. The early drugs in this group had unfortunate and uncomfortable side effects, and had to be administered with caution. However, as time went on and other hypotensive compounds were formulated, it was soon seen that the treatment of hypertension was well worth while.

Later the first oral diuretics – the thiazides – were introduced, and they, with the more recent diuretics, revolutionised the treatment of cardiac failure, and particularly the treatment of what might be termed chronic failure. Before this we had to rely on digitalis and injections of mersalyl. Today it is astonishing the number of cardiac cases who can lead comfortable and reasonably active lives due to the combination of digitalis and oral diuretics. One knows of many patients who have suffered severe attacks of congestive failure and are now easily maintained with these drugs. In the old days many would not have survived a year. One of the interesting by-products of the oral diuretics in practice has been a noticeable drop in night calls for cardiac asthma.

Corticosteroids were produced and, with a great flourish of trumpets, cortisone and its derivatives were presented to the profession and the public. At that time they appeared to be a panacea for many ills. But the bogey of side effects and the limitations of treatment with these drugs soon became apparent. In time their place in therapeutics was properly evaluated. The corticosteroids can be life saving drugs in many serious and some uncommon conditions, and at the same time, provided they are used judiciously, bring relief and comfort in such common and disabling conditions as rheumatoid disease and asthma. They have, of course, been a godsend to the dermatologists and their patients. One wonders sometimes what has happened to the surplus supplies of tar, which used to be prescribed in vast quantities and under many guises.

In psychiatry E.C.T. was being used more and more. In suitable cases of endogenous depression it gave results little short of the miraculous. I have seen patients whose lives were quite literally transformed after a few treatments. When we got the anti-depressant drugs, E.C.T. was not so much required. As time went on one became more confident in diagnosing depression and treating it with the tricyclic drugs. To me the response, in the truly depressed patient, gave a great sense of satisfaction. To see these poor unhappy people returned to a bright and enjoyable life brought me great pleasure. Of course, the treatment was not always effective, due I am inclined to think to inaccurate diagnosis. I have often thought how useful a biochemical test for depression would be. Who knows, it may yet come.

Thirty years ago we had not heard of tranquillisers and anti-depressants, and had to rely on barbiturates and bromides. Bromide was quite a helpful drug. I remember my senior partner describing it as specific for menopausal symptoms; that of course was in the days before the oestrogens were used. Today it never seems to be used, although it was effective in short courses. I can only remember one case of bromism. The phenothiazines were the first generation of this group of new drugs. I remember when Largactil was first marketed being assured by a pharmaceutical representative that it would replace E.C.T. It did not, however, work quite like that. It is not a true anti-depressant, but most useful in some psychosis and in the disturbed elderly. Then the benzo-diazapines came along. Librium, then Valium and now Nobrium, etc., all valuable for the anxious and agitated, but it is much easier to start their use with a patient than to discontinue it. The quantity of these and similar drugs ingested throughout the population is colossal. Why, I do not know. Some blame must be put on ourselves, who find it easier to prescribe them than to spend much time trying to help the patient sort out his or her problems. It may be partly addiction or drug dependance, whichever term you like to use; but why do people have so much more anxiety and depression than they did 30 to 40 years ago? Is it due to what is termed the pace of modern life, or is it due to discontent and fear of not being able to keep up with the Jones's? Or is it due to our change of values both material and spiritual in our supposedly highly civilised society? There seems to be a great amount of insecurity in present day life which must contribute to all this. Of course the appalling situation in our country in the last few years has accentuated this, but there is a world-wide restlessness and loss of confidence.

However, I have digressed. During the past thirty years practically all the so-called infectious fevers have been eliminated or brought under control. I cannot remember when I last saw a case of diphtheria. It is strange how scarlet fever has spontaneously changed its form. Once it was a potential killer and damager of the kidneys. Now it seems to be practically always a benign and insignificant illness. Tuberculosis is controlled to a great extent and is treatable. Poliomyelitis is, we hope, practically eliminated due to the vigorous immunisation schemes sponsored by our public health colleagues.

Surgery has advanced quite unimaginably and its horizons seem to know no bounds. What is probably most noticed by the family doctor, who rarely nowadays has the opportunity of being present at his patients' operations, is that surgery has become so much less traumatic to the patients. They seem to take their operations in their stride, as indeed does the modern young mother take her confinements, and convalescence is much shorter. In the old days an abdominal operation meant months of infirmity and apprehensive familial sympathy. I am certain that early post-operative ambulation has been a great factor in this, both physically and psychologically. Having said all this, I think that it should be remembered that surgery could not have made the strides that it has without the wonderful advances in anaesthesia. The anaesthetists appear to be able to give the surgeons practically carte blanche in their procedures, and they have undoubtedly contributed immensely to the patients' comfort and post-operative progress. When I first started in practice I had to give the anaesthetics, while my partner assisted. It was really a very crude business for the patient, the surgeon

and myself. When I was a surgical pupil in the Royal, I recall Cecil Calvert coming up one night to do an appendicectomy. I was deputed to give the anaesthetic. When he had finished he came to me and with his quite unforgettable quiet smile remarked, "That was rather an in and out anaesthetic, wasn't it?" I could but agree.

This has been, I am afraid, a rather sketchy and superficial résumé of the advances in treatment during this period. There are many other matters which I could and should have mentioned, but looking back, perhaps these are the things which probably impressed me most, and made the greatest impact on our work.

I have not dared to mention the permissive society and all its implications. A whole paper could be devoted to that. But, I would like to say, that from what I have seen, the young people of today are on the whole a very good lot, and much better informed and more socially conscious than my generation at their age.

As medicine becomes more and more specialised there are more and more sophisticated techniques of diagnosis and treatment which the family doctor should know of, but has little opportunity of using.

With all the discoveries and advances in treatment we are perhaps apt to be a little self-satisfied. What is on the other side of the coin?

Digitalis is still the sheet anchor in cardiology. No better analgesic than morphine or its derivatives has appeared. Ergot and pituitary extract have not been superseded in obstetrics. Glyceryl trinitrate gives the most rapid and predictable relief in angina, and, dare I say it, aspirin is still probably the best day to day analgesic, in spite of the fashionable paracetamol, which is less effective and may be nephrotoxic. A poultice is still very comforting in superficial sepsis while the antibiotics get to work. We have lost, unfortunately, the art of the use of the placebo in what we used to call functional conditions, because we think we have really potent drugs for so many disorders. Many of these used to respond to a placebo and continuing reassurance in complete safety. Do we really know much more of the aetiology and treatment of peptic ulcer than we did forty years ago? Vitamin $B_{12}$ is still recommended in the treatment of multiple sclerosis, although its effects, if any, are dubious. The treatment of rheumatoid arthritis is little changed except for the suitable exhibition of steroids and the most recent analgesics in the pharmaceutical mail. Osteoarthritis and all the other degenerative diseases are still with us. Coronary artery disease has increased enormously and although the treatment now provided has saved many lives, there is no agreement on the many theories of prevention. Common viral diseases are untreatable, although vaccination is a help in some.

Malignant disease is as common as ever and although cure can take place if by good fortune the patient presents early, the aetiology is as obscure as ever, except in lung cancer. So far as I can see the best regime for treatment of cancer of the breast is not agreed. In 1954 I was called to see a lady in the terminal stages of this disease – a fungating mass, multiple secondaries, ascites and so on. She only survived for a week. I asked her when she had first noticed the lump. She replied, "About the time of the air-raids, but I didn't see you because of the way my mother was." The poor old mother was then demented. That was a thirteen year

survival, without treatment, in a series of one. Not, I realise, statistically significant, but rather interesting. Some day, we trust soon, the breakthrough in the treatment of cancer will come.

The pattern of morbidity has changed as so many of the acute conditions can be controlled and treated, so we find that more and more time is being spent on the degenerative diseases, and, as I have mentioned, on psychiatric conditions.

While all these therapeutic advances were becoming available in the post-war years, there was, of course, great activity on the medico-political front. With Government plans going ahead for the introduction of the Beveridge Welfare State, the profession was soon suffering from an acute anxiety neurosis. It was inevitable that the National Health Service would come into being, but we, having in the past conducted our profession in a rather individualistic fashion, were apprehensive of government control and direction. There were many acrimonious and some near hysterical meetings as the discussions went on. Ultimately the 4th July, 1948, arrived and we were in it for better or for worse. Personally I felt that, with increasing costs and rapidly expanding, and usually expensive, facilities for treatment, the Health Service was quite inevitable, as well as being basically truly humanitarian. I still believe that when history comes to be written the courageous experiment of the Welfare State will rank very high amongst social reforms.

In the early days of the Health Service, general practice was in the doldrums and general pracitioners appeared to develop an inferiority complex. The reasons for this were difficult to pin-point, but I think it was partly due to the greater publicity given to the rapid expansion of the hospital service, partly to the differential in remuneration between consultants and general practitioners and perhaps largely to fear of the possible consequences of the new regime. There was great talk of abuse of the service by patients, the unnecessary work demanded by trivial complaints and of course economic considerations. The last was remedied to some extent by the Dankwerts Award and over the years has continued to be improved. I never found abuse of the service by patients to a noticeable extent. People did not come to sit in the waiting room for an hour or an hour and a half, unless they had a problem and wanted help. The complaints that appear trivial to the doctor may be very big to the layman, and surely it is the primary duty of every doctor to answer any call for help. And, of course, the trivial symptom can be the pointer to something sinister. What I did frequently notice was the consideration of the patients – "Johnny has been ill for four days, but I didn't want to trouble you; we know how busy you are now." I heard that time and again, and often wished I had been called earlier.

With the development of the Health Service the work and scope of the hospitals became greater and greater. Expert consultant advice became available all through the country, as well as in the larger more specialised centres. The assistance and advice available to family doctors has been most helpful and has contributed greatly to the standards of general practice. The care and comfort of patients in hospital is vastly improved, but with all the modern techniques, humanity has not been lost. Almost without exception patients who have been in hospital extole the kindness, skill and thoughtfulness of the nursing and medical staff.

One aspect of the hospital service, which if I dare suggest, could I believe be improved in some units is communications. To this day a visit to out-patients or admission to the wards is a frightening experience to most people. But to go to hospital and to be given little information about your condition or treatment, and then to have to wait usually for some weeks before the family doctor gets the report, causes much anxiety and distress to the patient, and is a source of frustration to the doctor. I am sure this could be greatly improved.

The large number and frequency of review appointments which some departments use, seem to me to be unnecessary. The patients are called back at frequent intervals and usually are seen by a different registrar each time. In most cases these follow-ups could be done quite effectively by the general practitioner, and with less inconvenience and worry to the patient, and avoidance of hospital neurosis.

It seems a pity that the day of the old fashioned domiciliary consultation between consultant and family doctor at the patient's bedside is declining. Nearly always now it appears to be too difficult to arrange a mutually suitable time for this. I believe that all parties concerned are thereby losers. Over the years I learned a great deal from my senior colleagues chatting after the consultation. Of course frequently on the visit to the patient next day, one was asked, "But what do YOU really think, doctor?" – a small example of the sometimes frightening trust people put in their family doctor.

In 1952 the College of General Practitioners was launched through the far-sightedness and enthusiasm of a comparatively small number of men in London and throughout the country. I think the object of the College can best be summed up by its noble motto, "Scientia cum Caritas"—Science with compassion. It is purely an academic body with no political intent, formed with the improvement of the quality and status of general practice as its aim. This it is achieving over the years. Many useful research projects have been carried out by the College, the concept of continuing post-graduate education and the introduction of under-graduates to practice were inaugurated. These things are taken for granted now, but it is well to remember that the College had so much to do with the propagation of the ideas. More and more universities have now introduced departments of general practice, many with professorial chairs. Here again the stimulus of the College has been a notable factor. The College is consulted at the highest levels on all things pertaining to the academic side of general practice, and I am sure that it has brought a new dignity and confidence to its members. It must be a great source of satisfaction to its founders that the College has achieved so much in twenty years.

As time went on more and more partnerships were formed, group practices came into being in converted or purpose-built premises. A few experimental health centres appeared. With more financial help from the government and with the liberalisation of official policies, these tendencies accelerated. Health centres and group practices are common place – the single handed practice is disappearing in all but the remote areas.

All these changes have been of great advantage to doctors. They are working under better conditions, with improved equipment and facilities, and often with the assistance of nurses, social and welfare workers. They are no longer in

isolation, but can work in cohesive teams, with all the help of discussion and sharing of duties.

With these advantages in the organisation of our work, we must not lose sight of the raison d'etre of our job – the patient. I believe very strongly that general practice to fulfil its highest aims, must be a personal service between the doctor and the patient. It has always been maintained that the continuance of personal and family care is perhaps the greatest asset of general practice. I have had some misgivings that in these days and in the future this principle may become eroded. With multiple partnerships it is easy for the patient to have less continuing care from his doctor of choice. I feel that if this tendency should go on it will be a disadvantage to the patient: and the doctor will lose a great deal of satisfaction in his work if patients become depersonalised, rather than friends who depend on his help through difficult periods in their lives. In the recent report on the Organisation of Group Practice, it is stated "the primary object of all medical care is to meet the health needs of the individual and the society in which he or she lives." This must not be lost sight of.

General practice has always been an exacting way of life, both physically and mentally, with the responsibility of being prepared at all times to make the right decision in matters of little importance, or literally in matters of life and death. But today with the changes which I have mentioned, it is much less arduous and practitioners are better trained and equipped to deal with their work. Nevertheless, I feel strongly that the needs of individual patients must be the doctor's first consideration. In all organisation of practices this must be given priority. In other words the doctor must still have the same dedication and unselfishness in his professional work which so many of his forbears had.

I fear that this has been rather a meandering address and perhaps too autobiographical. However, I have tried to show you some of the thoughts of an ageing general practitioner, looking back over his time in practice. Many things have changed, but we should not accept change without proof, purely for the sake of change. I have seen many theories advanced which appeared wonderful, but were found to be of little value. Vitamins were hailed as a cure for all ills. Fifteen years ago we were told we should not eat fat. Today sugar has been labelled the great enemy of our health. I have sympathy with the old adage "a little of what you fancy does you good", the operative word of course being "little".If you think about it, the human digestion and metabolism are extraordinarily flexible and tolerant processes.

Various remarks have been made of "the cottage industry" but it should be remembered that in the past many workers in cottage industries were superbly skilled craftsmen.

Let us go forward and maintain the standards and integrity in the art of our profession which our predecessors laid down, aided by all the continuing wonderful advances in the science of medicine.

I thank you all for coming here tonight and listening so patiently.

Scientia cum Caritas – do not let us forget the Caritas!

# CONSTITUTION AND BYE-LAWS OF THE ULSTER MEDICAL SOCIETY

Adopted at Annual General Meeting, 5th October, 1972

## A. Constitution

I. The Society shall be called the Ulster Medical Society.

II. It shall consist of Honorary Fellows, Fellows, Life Fellows, Members and Honorary Associate Members.

III. HONORARY FELLOWS. Eminent medical men, or those who have distinguished themselves by their publications or contributions to medical science, shall be eligible for election as Honorary Fellows.

IV. FELLOWS. All persons registered for seven years as medical practitioners under the Medical Acts shall be eligible for election as Fellows. The Annual Subscription shall be £3.15 for those practising or residing within a radius of ten miles from the centre of the City of Belfast, they shall be known as Town Fellows (husbands and wives in the above category who are both Fellows will be entitled to pay a combined subscription of £4.20); £2.10 for those practising or residing outside this radius, they shall be known as Country Fellows (husbands and wives in the above category who are both Fellows will be entitled to pay a combined subscription of £3.15).

V. LIFE FELLOWS. Any duly elected Fellow or Member shall, subject to the approval of the Council, be entitled to a life-fellowship on payment of a single subscription of £30.00 for a Town Fellow, or £20.00 for a Country Fellow. All Fellows or Members of the Society who have paid subscriptions for 40 years or more shall be exempted from any further subscription. Fellows and Members of the Society who have paid subscriptions for 20 years and who have reached the age of 65 shall also be exempt from any further subscription.

VI. MEMBERS. All persons registered as medical practitioners under the Medical Acts shall be eligible for election as members of the Society on an annual subscription of £1.05. Such membership shall terminate at the end of the seventh year after the date of medical registration. Members shall then become Fellows.

VII. TEMPORARY MEMBERS. At the discretion of the Council, medical practitioners temporarily resident in Northern Ireland shall be entitled to temporary membership of the Society without subscription or the power to vote.

VIII. Fellows and Members shall enjoy equal voting privileges in all ordinary divisions at the business meetings of the Society, but Members shall not have the right of voting in the election of Fellows.

IX. HONORARY ASSOCIATE MEMBERS. The Society may, on the recommendation of the Council, elect at an Ordinary Meeting, eminent persons who are not registered medical practitioners, as Honorary Associate Members.

X. ALTERATION OF CONSTITUTION AND BYE-LAWS. Alterations must have the approval of the Council, and afterwards be passed by an Annual Meeting, or a Special Meeting summoned for the purpose, of which seven clear days' notice must be given.

XI. A copy of the Constitution and Bye-Laws, with all alterations thereto, shall be kept in the custody of the Honorary Secretary.

### B. Government

I. Only Fellows shall be eligible to become office-bearers.

II. The Society shall be under the control and management of a President, the President-elect, the immediate Past-President, two Vice-Presidents, an Honorary Secretary, an Honorary Assistant Secretary, an Honorary Treasurer, an Honorary Librarian, an Honorary Editor of the Ulster Medical Journal and an Honorary Archivist who, with eight elected Fellows, shall constitute the Council of the Society.

III. Of the eight elected members of Council, any member who has held office for three consecutive years shall not be eligible for re-election of this office within twelve months.

IV. The Council shall have power to adjudicate in all cases where ethical questions are involved.

### C. Payment of Subscription

I. Subscriptions to the Society are due, in advance, on the 1st November of each year.

II. Fellows and Members whose subscriptions are two years or more in arrears shall be regarded as having allowed their Fellowship or Membership to lapse.

III. Fellows or Members elected after 1st February shall be required to pay only half the annual subscription for the current session.

### D. Election, Resignation, etc., of Honorary Fellows, Fellows, Members, and Honorary Associate Members

I. The name of each prospective candidate for Fellowship and Membership shall first be reported to an officer of the Society by his proposer and seconder for consideration, and displayed on the blackboard at the subsequent ordinary meeting if found suitable. The candidate shall then be considered elected if no objection be received within two weeks. If any objection be lodged a ballot shall be taken at the next ordinary meeting. One black ball in four shall exclude.

II. No Fellow or Member shall be understood to have withdrawn from the Society until he shall have paid all money due, returned all books, and other property belonging to the Society, and signified his intention of resigning by letter addressed to the Honorary Secretary; and if such letter be not received previous to 1st November, the subscription of such Fellow or Member shall become due on that date. The resignation shall be recorded in the Minutes.

III. Whenever there shall appear to be cause in the opinion of the Council, for the expulsion of any Fellow or Member, a minute shall be made thereof, which shall be communicated in a registered letter to the Fellow or Member concerned fourteen days before the next meeting of the Council. He shall be invited to reply to the Council and if no satisfactory explanation be received before the next Council meeting a minute shall be submitted for the consideration of the annual or special general meeting. On the minute being put to the ballot, if three-fourths of the Fellows present vote for it (forty at least being present) the President of the meeting shall declare the same confirmed accordingly. No proposition for the expulsion of any Fellow or Member shall be entertained at any meeting, either of the Society or the Council, of which due notice has not been given in the circular calling such meeting.

### E. President

The President shall be elected annually at the Annual Meeting.

### F. Vice-Presidents

There shall be two Vice-Presidents who shall be elected annually.

### G. Honorary Treasurer

I. The Honorary Treasurer shall be elected annually, but no one shall hold the office for more than five years in succession.

II. He shall, on entering upon his office, received from his predecessor whatever balance of money is in hands, and shall pay into the Banking Accounts of the Society all monies belonging to it; he shall have charge of, and be responsible for, the custody of all deeds and documents pertaining to the finance of the Society.

III. He shall receive all monies due, donations and bequests, and discharge all bills or demands when ordered by the Council; he shall not pay any sum of money on account of the Society without the sanction of the Council.

IV. He shall keep a printed receipt book for annual subscriptions; each receipt to be signed by him, and to be filled up with the name of the Fellow or Member paying, the sum paid, and the date when paid (bankers' orders excepted).

V. He shall present to the Council, or on request by any member of the Council, a report of the state of the funds of the Society.

VI. He shall make up and balance the accounts of the Society to 30th April in each year, and after that date he shall submit the same with the requisite vouchers to the auditors appointed by the Council.

VII. He shall not be considered liable for the default of any other person during the period he has held office.

### H. Honorary Secretary

I. The Honorary Secretary shall be elected annually, but no one shall hold the office for more than five years in succession.

II. The duties of the Honorary Secretary shall be to issue notices for all meetings of the Council, and of the Society, to attend such meetings, to record the minutes, to have charge of the minute book and any other documents entrusted to him by the Council, to conduct the correspondence of the Society, and to send to the medical journals for publication any proceedings of the ordinary meetings as may be directed by the Council.

III. He shall receive from members notices of papers or specimens, etc.

### I. Honorary Assistant Secretary

I. The Honorary Assistant Secretary shall be elected annually, but no one shall hold the office for more than five years in succession.

II. His duties shall be to assist the Honorary Secretary.

III. In the absence of the Honorary Secretary, his duties shall devolve upon the Honorary Assistant Secretary.

### J. Honorary Librarian

I. The Honorary Librarian shall be elected annually, but no one shall hold the office for more than five years in succession.

II. He shall exercise supervision over the management of the Library, and shall see that the Bye-Laws are enforced.

### K. Vacancies in Council

In the event of any office becoming vacant, the Council shall have power to co-opt a Fellow to fill the vacancy for that year.

### L. Special Meetings

The Council may summon a special meeting whenever they consider it necessary, and must do so if requested in writing by ten Fellows of the Society.

### Bye-Laws

I. The annual meeting shall be held before the commencement of a new session and the officials then elected shall assume office, with the exception

of the President who shall take office from the date of his inauguration, and in any case not later than 1st November.

II. The ordinary meetings of the Society shall, as far as possible be held on Thursdays.

III. Procedure at the ordinary meetings:

1. Chair to be taken by the President, or, in his absence by one of the Vice-Presidents, or in their absence by a Chairman chosen by the meeting.
2. Reading and confirmation of minutes of previous meetings, Ballotting for Fellows or Members, Proposing new Fellows or Members, Notices of Motion, Ordinary Business, which shall be, as far as possible, conducted in the order in which the subjects appear on the circular.
3. Fellows or Members addressing the meeting shall do so standing, and the ordinary rules of debate shall be observed. The President's ruling shall be final.

## Regulations for Publication of The Ulster Medical Journal

1. The Council shall be empowered by the general meeting to make arrangements for the appointment of an Editorial Board and the Honorary Editor of the Journal.
2. The Editorial Board shall be responsible for the policy and publication of the Ulster Medical Journal. The Honorary Editor shall be convener of the Board and responsible for preparation of the Journal.
3. The author of a paper read before the Society may submit the manuscript of his paper to the Honorary Editor. Fellows and Members and others may submit papers not read to the Society. Contributions from Fellows and Members and from outside authorities may be invited.
4. Papers submitted for publication, on which the Editor or any members of the Editorial Board does not feel competent to adjudicate, may be submitted to a recognised authority.
5. The Journal is primarily concerned to record medical work and research done in the province and with the history of medicine in the area.
6. All papers shall be typed in double spacing with references conforming to the current practice of the Journal. Illustrations must be limited to those really required and should preferably be line drawings. Their place in the text should be indicated and they should be accompanied by brief legends on a separate sheet.
7. Copyright in the Journal is obtained and is retained by the Society, but release of copyright will gladly be given to authors, and the Honorary Editor is empowered to grant this.
8. If reprints are required, orders must be placed with the printers. The cost of these should be obtained from the printers in advance.

9. Fellows and Members shall receive the Journal free of charge.
10. The rate of subscription to the Journal for non-members shall be fixed by the Council. Details on ordering and subscriptions and on exchange journals are given in each number of the Journal. Only editorial communications and books for review should be sent to the Honorary Editor.

# SIR WILLIAM THOMSON, PHYSICIAN

**By H. W. GALLAGHER, M.B., F.R.C.S.,**

Consultant Surgeon, Ards Hospital, Newtownards, Co. Down

Lecture to Ulster Medical Society, 16th November, 1972

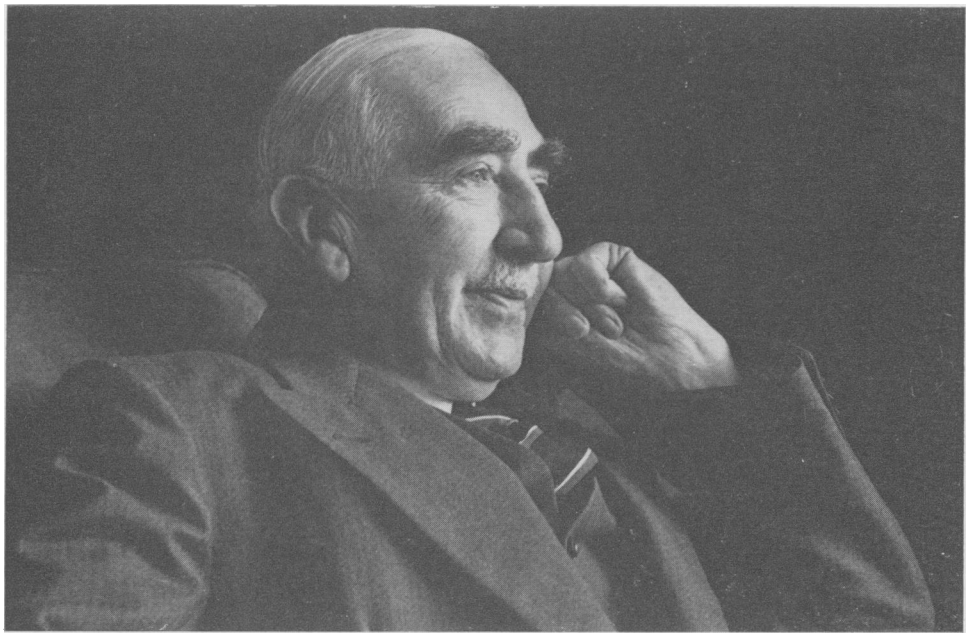


FIG. 1

WILLIAM WILLIS DALZIEL THOMSON

Knight Bachelor
B.A., B.Sc., M.D., D.P.H., F.R.C.P. Lond.

Deputy Lieutenant for the City and County Borough of Belfast
Professor of Medicine in the Queen's University of Belfast
Senior Consultant Physician in the Royal Victoria Hospital, Belfast

8th September, 1885, Anahilt, County Down
26th November, 1950, University Square, Belfast

ABOUT 35 YEARS AGO a young inexperienced and very nervous student entered Wards 1 and 2 of the Royal Victoria Hospital, Belfast, as resident pupil. The same student – I hope I am still capable of learning – stands before you this evening and hopes you will receive him as graciously as Professor W. W. D. Thomson did on that occasion. He shook my hand and welcomed me as a new member of his team. This was all the more unexpected because of what I had experienced in the previous month in a surgical ward where, as resident pupil, that lowest form of hospital life, I had been treated no worse, I suppose, than I deserved. In contrast

to that, W.D., whom we remember much as in figure 1, seemed to regard me as essential in the care and treatment of his patients. He cast on me a mantle of responsibility which really did not fit and at the same time inspired me to try and grow into it. I did not know then, and have only realised since attempting this appreciation, that this was part of the genius of the man.

Some 13 years previously, when still under 40 years of age, at the annual ceremony of the opening of the session he had addressed the students of the Royal Victoria as equals. The text has been lost, and all we have is the report in the Belfast News Letter of 16th October, 1924, and I quote from that report, "He welcomed the students to a life of study. In fact all members and would-be members were fellow students in the medical profession and there was no appreciable interval between the teacher and the taught, both were in the same class, the one a little more advanced than the other."

That short month was my only close contact with Professor Thomson as he then was. I attended his classes and clinics and was examined by him in at least one of the prize examinations in final year, but to him I could only have been one of a very large class. Therefore you will note that I have no qualifications at all for the task which I have undertaken and I am very conscious that what I say and the manner in which I say it, cannot hope to emulate the obituary notices and memorial addresses which appeared and were given after his death in 1950. Those of you who have read these tributes by Dr. R. S. Allison, Dr. J. T. Lewis, Prof. Sir John Biggart and others, will realise that I am not attempting the impossible task of copying them, but some here to-night may be stimulated to look at these tributes in the *British Medical Journal, Lancet, Queen's University Record* and *Munk's Roll.* However, the reason I have undertaken the task will become apparent as the story unfolds.

## Early Life

It begins in 1885, when the wife of Dr. William Thomson, the dispensary doctor in Anahilt, gave birth to her first son and fourth child, about twelve years after the youngest of three daughters had been born. He was named William Willis Dalziel, William after his father, Willis and Dalziel after two of his father's brothers.

In the late 19th century a Mr. Harty was organist of Hillsborough Parish Church. He used to visit Anahilt Dispensary to teach music to the Thomson girls. He travelled by pony and trap, often being driven by his son, afterwards the world famous Herbert Hamilton Harty. Bertie Harty and Willie Thomson played together while the girls made music. Their friendship was renewed many years later during one of Hamilton Harty's visits to Belfast, and thereafter Harty made 25 University Square his Belfast headquarters. It is very appropriate that the Hamilton Harty Room is just opposite what should now be called Thomson House.

After a period in the local primary school, W.D. went to Campbell College and was a bright scholar, being awarded exhibitions in at least Preparatory and Junior Grades. He had every intention of proceeding to university when tragedy struck the family. His father got up from a bed of illness to attend a patient and was himself struck down with pneumonia which in those days was more than just the old man's friend – it was still a very dangerous and even fatal illness for younger people, and it proved fatal in this instance.

## University Career

A university career seemed to be impossible – no Welfare State, no education grants – and but for the foresight and confidence of the Headmaster of Campbell there would have been no university career. He was convinced that Willie would be able to maintain himself at Queen's College by bursaries and scholarships. He inspired Mrs. Thomson with the same faith, which was justified in 1907 when W.D. graduated from the Royal University of Ireland with First Class Honours, and with the Dunville Studentship and Senior Scholarship, all of which are commemorated in a signet ring which his mother gave him. It is inscribed on the inside with B.A., D.S., S.S., Q.C.S., 1907. It is the only thing he took from his mother during his undergraduate years. We do not know if the ring was made specially for the occasion or whether it had belonged to his father, but the crest, a buck's head, with the motto "Industria Murus" meant a lot to W.W.D. It is the crest of one branch of the Scottish Thomsons. Note the absence of a "p" which signifies that he was a son of the Scottish Tom and at times he became quite annoyed if a Sassenach origin were suggested by the insertion of a "p". Many years after this, W.D. used the same crest and the crests of his beloved university and city for the design of the leaded lights he had installed in his consulting suite at 25 University Square. "Industria Murus" – "Industry is a protection" or "hard work is my defence". Certainly W.W.D. had plenty of that because for three years of his student career he helped to support himself by teaching Botany in both Victoria College and Princess Gardens School, in the latter of which his sister, Mrs. Duncan, was headmistress. He also found time to take a full part in student activities; and every Society he joined, elected him, or tried to elect him to high office. As early as 1905 he was on the Committee of the Belfast Medical Students Association, and became senior secretary for 1907/8, and in the same year was representative of the Students Representative Council to the Fifth Annual Congress of the British University Students. He was also Secretary of the Publications Committee of the S.R.C. This Committee was responsible for the monthly appearance of the College Magazine, Q.C.B., and one would have expected that the following year he would have become Chairman of Committee and Editor of the Magazine, but instead he became President of the S.R.C., a position which carried with it membership of the Senate of the University, which Queen's College had now become. Times have changed, now, I believe, the Presidency of the S.R.C. is a paid full-time appointment, but he took it in his stride as a part-time office.

In 1907 higher education in Ireland was being reorganised and of course the country was in a turmoil politically. Many changes were suggested and a big debate was mounted by the S.R.C. to discuss the proposal that "A National University is desirable for Ireland." W.D. was chosen to be their spokesman and his arguments in favour of the dis-establishment of Dublin University and making Trinity College a constituent college of a new National University are interesting. He quoted the maxim "Dublin University is for the classes, the Royal for the masses". He stated that Roman Catholics and Nonconformists were virtually excluded from Trinity and anything less than amalgamation would perpetuate the battle of Trinity versus the rest, which was just one aspect of the battle of the Church of Ireland versus the rest. In fact, he said, "an amalgamation would be a contribution to unity

and concord in this distracted land of ours, and would be the first step to lead us into the paths of peace." However, the audience did not think much of this and an amendment that Dublin University be preserved was carried by 34 to 28. But such are the vagaries and inconsistencies of the Irish character that when this was put as a substantive motion, it was lost by 30–44.

The only association in which he refused to take office was the Christian Union and in later life he regretted that, by refusing office, he had supported the puritanical belief that a person could not be a Christian and enjoy a bottle of beer, as he did. His enquiring mind made acceptance of many dogmas difficult, if not impossible, but in spite of, or perhaps because of this, he was basically a man of faith, in the same manner as his Presbyterian forbears.

One would think that all those student activities were enough for any one person, but in addition he took a leading part in the Great Fete of 1907, in which the gentry and nobility of the province joined in organising a four-day sale for the Athletic Field Fund. One duchess, two marchionesses, four countesses, two viscountesses, and thirteen ladies were involved in running the stalls, and almost £3,000 was raised. If W.D. had to act as mediator between such distinguished ladies he had a hard time, but equally he had an opportunity for acquiring the charm and diplomacy which became characteristic in later life.

Industria Murus – certainly he lived up to it. In 1911 he graduated M.B., with First Class Honours, but graduation did not stop his thirst for knowledge or his brilliant achievements; 1912, D.P.H.; 1913, B.Sc. with First Class Honours; 1916, M.D. with Gold Medal; 1918, M.R.C.P., to be followed later, of course, by F.R.C.P. I thought that giants had died out with Goliath or Finn McCool, but W.D. was a giant, physically, intellectually, morally – in every way. He had all the gifts and made use of them. Genius is said to be 90 per cent perspiration and 10 per cent inspiration and he certainly worked hard for all his attainments.

After qualifying he visited Dublin, London, Budapest and Paris, where he worked with Widal on the problems of nephritis. One of his early papers, based on this work, demonstrated that correlation of blood urea levels with urinary excretion of urea could be a help in prognosis. One sentence reads, "The patient empties his bladder completely; quarter of an hour afterwards about forty cubic centimetres of blood are taken, either by venous puncture or by cupping". Cupping evidently was still being practised in 1914. I, for one, had no idea that such vast amounts of blood could be taken by such means.

## Marriage and War Service

About this time he spent a year as Resident Medical Officer in Purdysburn Fever Hospital; an elegant young man and eligible bachelor. While there he contracted scarlet fever and was extremely ill, but no doubt he was well looked after by the beautiful nurses, with whom, I am sure, he was a favourite patient. But if any had matrimonial designs they were frustrated, because in 1914 he married his first love, Josephine Barron, whom he had met when she was helping at the Great Fete of 1907. Now 65 years later she is still mentally brisk and active, and I am indebted to her for much of the information I am giving tonight. Her father,

Humphrey Barron, J.P., a well known Belfast business man, always regarded W.D. as his best investment.

After the honeymoon, planned for Spain, but spent in Ireland because of the deteriorating international situation, they returned to set up house in 25 University Square, which was their home for 36 years, and is now the office of the Dean of the Faculty, and appropriately the Health Centre for the University, and is still the home of Lady Thomson.

The best man was Dr. McCloy, a friend and contemporary but much older, having been a teacher before embarking on the study of medicine. His present to the young couple was a print of Fildes' famous painting "The Doctor". It hung in University Square for 57 years, and is now in B.M.A. House, Belfast – a gift from Lady Thomson to the profession. W.D. had this painting in the hallway where he could see it and be reminded daily of its message, which is much more required by us than by him or the doctors of his generation. In this era of scientific medicine we are apt to forget *compassion*. Balint reminds us that "The doctor is the medicine", and even if we do not believe it for ourselves there is no doubt that 50 years ago it was true. The best bedside manner is the sincere compassion there portrayed, although there was nothing practical the doctor could do for the dying child.

The painting had more than an aesthetic and ethical interest in the Thomson household because there was a family tradition that the doctor portrayed was Sir William Gowers who was a very distant relative by marriage. The family tree is long and I hope the following facts will suffice. In the eighteenth century, James Thomson, of Kilmarnock, after a university education, became a prominent business man, editor of the Ayrshire Miscellany, and a staunch supporter of the Hanoverian dynasty. His son, also James, came to Ulster in 1830 to minister to a congregation of the "Original Seceders" in Ballynahinch, and moved to the Presbyterian Church in Magherally in 1840. His son, Dr. William, who settled in Anahilt, married Elizabeth, daughter of Rev. T. McGregor Greer, of Anahilt, whose grand-niece, Kit, married Sir Ernest Gowers, son of Sir William Gowers, portrayed in the painting. Sir Ernest Gowers was the author of the famous guide to good English – "Plain Words" – and Sir William, an early neurologist is remembered in Gowers' tract.

Soon after marriage W.D. joined the Army and was chosen by Sir Almroth Wright, the most famous bacteriologist then living, to be part of his team at Wimereux, investigating sepsis, nephritis and trench foot. The other members of the team were Colebrook, Keith and Fleming. Wright was a Belfast man, but not a Queen's man. He had introduced innoculation against typhoid fever and had hopes of conquering other bacterial diseases by similar methods. The members of the team became lifelong friends and in fact had it not been for the friendships they formed, W.D.'s life would have been much curtailed – but that is jumping too far into the future.

In the same year, 1916, that he was awarded the M.D. with Gold Medal, his wife presented him with a greater treasure, their only child – Humphrey Barron – named after his maternal grandfather.

## The Young Professor

After the war, W.D. returned to civilian practice, first on the staff of the Mater Hospital, to which he had been appointed in 1912, then as Assistant Physician to the Royal Victoria Hospital from 1920–1924. He was appointed Professor of Medicine in 1923, and a year later became Physician In Charge of Wards 1 and 2. The inauguration of the new Professor by the students was in the traditional manner; another victim at the same time was Professor Andrew Fullerton.

In 1924 he gave the address of welcome at the opening session. I have already referred to part of this speech, but in it he also welcomed to the staff the late J. A. Smyth, Robert Marshall and his own cousin Hardy Greer, who shares the same physical features inherited in each case from the Rev. T. McGregor Greer. The distinctive brow and nose are well seen in the photograph (Figure 2) of W.D. introducing his patients to the Duchess of Gloucester in his beloved wards in the Royal Victoria Hospital. The report in the News Letter is, of necessity, incomplete, but apart from one grammatical infelicity probably gives a good impression of W.D's. style. I quote, "Surgery had developed from a shambles, reeking with blood and sepsis, horrors unspeakable, groping its antiseptic path through the mist of carbolic spray to *finally* emerge into the brilliant aseptic and life-saving science of the present day".

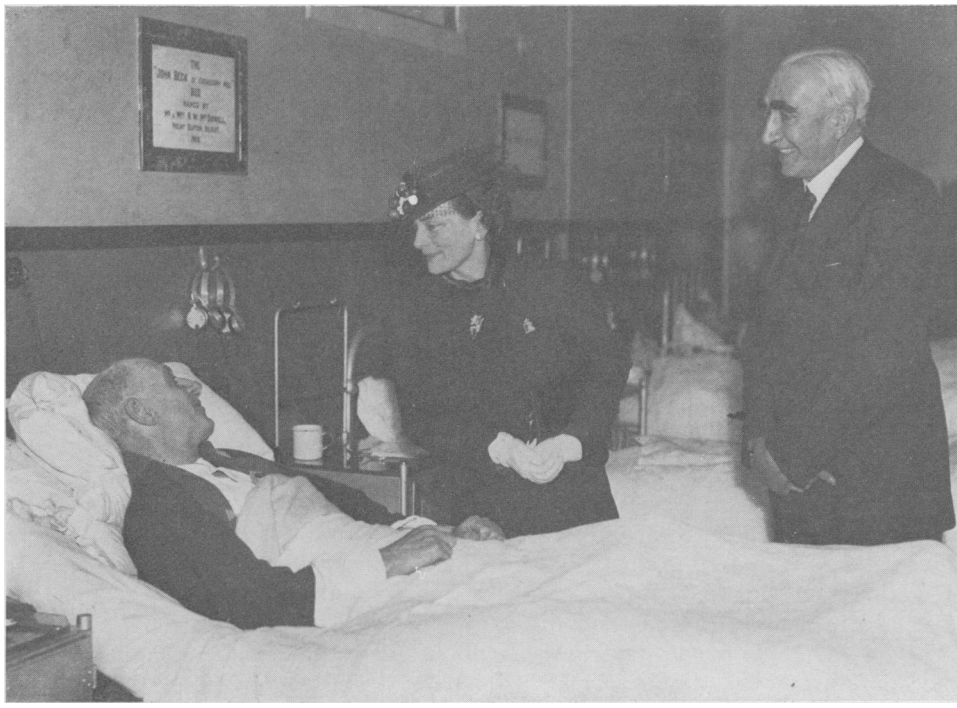


Fig. 2

*Professor Thomson introducing his patients to the Duchess of Gloucester in the Royal Victoria Hospital, Belfast*

Evidently he had a high opinion of his surgical colleagues but his own talents and interests would not have advanced him far on a surgical path. Looking back on his publications and judging them in the light of publication date, the only mistake I can find is when with Doctor, later Sir Thomas Houston, he tried treating surgical conditions such as onychia due to *Bacillus coli*. I quote, "A vaccine of this micro-organism was administered and after the first dose of $2\frac{1}{2}$ million immediate improvement set in and it was only necessary to administer a second dose to secure a complete cure". Here the story might have ended, and even today we might have agreed cause and effect – post hoc ergo propter hoc. But another sentence is added, "Both nails were lost". W.D.'s love of truth must out and, although he did not appreciate the curative effects of the nails coming off, he did not suppress the evidence! Another branch of the Thomson family also has a buck's head as its crest, but the motto is changed to "Honesty is the best Policy", and this was a favourite proverb oft repeated in the Thomson household.

## Illness

A distinguished career for the brilliant young professor now seemed assured but early in his professorship he was struck down by severe illness. It is now a popular medical hobby to try and diagnose illnesses of the famous, or upset the diagnoses previously made. No amount of research or questioning can alter the fact that W.D. had a very grave illness with all the symptoms and signs of severe ulcerative colitis, which had only been separated as a distinct entity from the various dysenteries in the early years of this century.

In 1932 Crohn, Ginzberg and Oppenheimer described what is now known as Crohn's disease, and I well remember the excitement in 1937 when Professor Crymble diagnosed a case. Crohn's disease of the colon has only recently been separated from ulcerative colitis and W.D's. case history would, I think be more in keeping with Crohn's disease of the colon than ulcerative colitis. But whatever the diagnosis, he was extremely ill. Appendicostomy, performed at great expense by a famous London surgeon, proved unavailing. He was transferred to the New Lodge Clinic under the care of the great Sir Arthur Hurst. Mrs. Thomson obtained accommodation nearby and every week Alexander Fleming came to visit them both and helped Mrs. Thomson shoulder this very heavy burden. Treatment in the clinic seemed unavailing and W.D. became most unhappy and distressed. On Fleming's advice – mediated through Thomas Houston – Sir Samuel Irwin, or S.T. as he was then, was instrumental in bringing him home, as everyone thought, to die. In fact he said goodbye to some of his friends, but the loving care of his wife kept him alive. Gradually he improved and although he never regained his previous vigour he was able to return to active work. When I was a student the fact that W.D. had had ulcerative colitis was well known. Note the tense "had had"! Many times before and after his treatment in the New Lodge Clinic he tried to resign his professional chair but Sir Richard Livingstone, the Vice-Chancellor, would not agree. His colleagues rallied round and did his duties for several years. In fact W.D. was incapable of work for about four years and when he did return he might have one solitary patient to see at an out-patient session.

Possibly at this time W.D. learned equanimity. Certainly he modelled his life

and conduct on his hero – the author of *Aequanimitas* – another William, born in the Canadian outback but famous throughout the world – famous more for what he got others to achieve than for what he personally added to scientific medicine, and of course famous also as a clinical teacher. W.D's. copy of Osler's Textbook of Medicine, now owned by Dr. John Weaver, shows how much time he spent with Osler in spirit, although as he himself said, "My younger narrower path never crossed his older wider orbit."

During his illness the Fellows and Members of this Society with a few other friends decided to show their appreciation of W.D's. worth and courage in adversity, and pleasure at his improved health by subscribing a very considerable sum of money with which a diamond ring for Mrs. Thomson and a silver tray were purchased. The tray, which was given by Lady Thomson to the University in 1968, was suitably inscribed and engraved with the signatures of the 140 donors including Almroth Wright and Alexander Fleming (Figure 3). This presentation affected W.D. very deeply and he vowed that in return he would try to do something to honour the medical profession of Ulster, especially in the context of the Ulster Medical Society. In 1937 his opportunity came when for his Presidential Address he chose the subject – "Some Aspects of the Life and Times of Sir Hans Sloane".

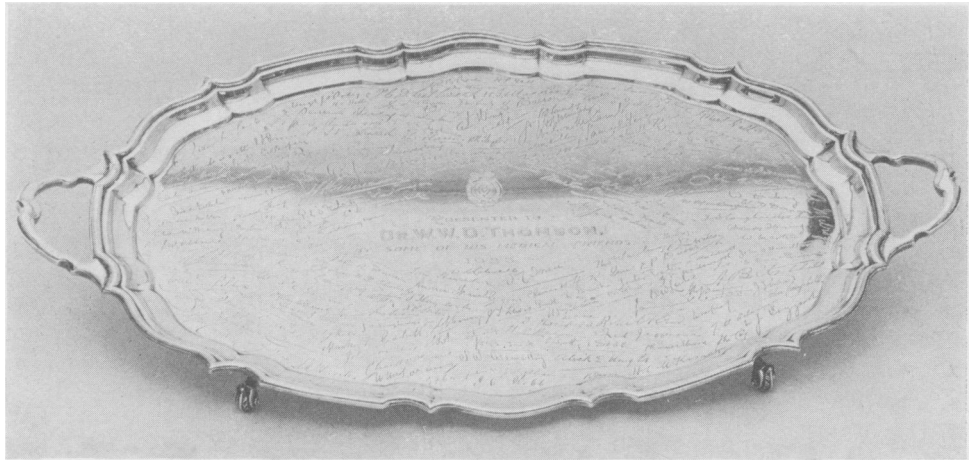


FIG. 3

*The Thomson Tray*

## HANS SLOANE

Such was my ignorance at that time, that when I first heard W.D. talk about "the man from Killyleagh", I thought he had gone mad. A poor boy from Killyleagh becoming the founder of the British Museum! It seemed incredible. It is more correct to say that he willed the foundation of that famous institution, but what a fortune he must have amassed to be able to acquire such a collection.

The biographical sketch of Sir Hans Sloane is a wonderful document. I find it far more readable and informative than other longer and more fulsome writings, but there is one remarkable vignette in the essay which had nothing to do with

Sir Hans Sloane. This is the story of James Walker of Hillsborough who in 1718 in the presence of Charles Seaton, dissenting minister of the Parish of Anahilt, was born after 48 hours of impacted labour conducted by Dr. John Sedgwick "in which parts of both arms had remained born and were so swollen by the contractive force of the uterus that it was impracticable to replace them". The redoubtable Dr. Sedgwick amputated both arms after dislocating them at the shoulders. He then performed a version and delivered the child who surprised them all by crying. The man-midwife then became surgeon and "sewed the wounds crossways, pulling the muscular parts over the scapulae, producing little stumps." This armless man became a horse dealer, and would ride 40 miles to a fair. He could dress and comb a horse as well as any groom, holding the curry-comb between his chin and shoulder.

This little story of the 18th century must have appealed to W.D. for three reasons; first, the heroism and resourcefulness of the general practitioner in mastering two frightful situations in rapid succession; secondly, the illustration of how grit and determination can overcome an apparently insuperable disability – reminiscent of how he had overcome his own ulcerative colitis or whatever illness it was; and thirdly, the dissenting minister, Charles Seaton, who by his very presence and consent, had shown his willingness to share responsibility if success had not crowned the efforts of the general practitioner, was the predecessor of W.D's. own grandfather in the pulpit of the Presbyterian Church of Anahilt.

There are two strange omissions in the story of Sir Hans Sloane. W.D. does not mention that not only did Sloane bring back from Jamaica a collection of plants but also the secret recipe for milk chocolate from which he must have earned a considerable amount towards the £50,000 he considered he spent on forming the collection which was the nucleus for the British Museum. Cadbury Bros. eventually obtained the recipe and in the mid-nineteenth century used Sir Hans Sloane's name as an advertising gimmick. W.D. also omits that Sloane apparently acquiesced in the treatment of his niece by Mad Sally Mapp, the bone setter, who is portrayed in the famous satire by Hogarth "The Undertakers". The Borough of Epsom paid Sally Mapp a retainer of 300 guineas to ensure that she lived within the Borough for one year because of the trade she encouraged by her very presence. A guinea in those days bought a ton of coal, now it does not even buy a hundredweight! Sloane's neice was neither the first nor the last to be cured of sciatic scoliosis by the ministrations of the unorthodox.

A portrait of Hans Sloane, painted by Stephen Slaughter in 1736, hangs in the National Portrait Gallery, London. W.D. presented a copy of this, painted by Clifford Hall, to this Society. It now hangs in B.M.A. House since the closure of the Whitla Medical Institute.

## The Thirties

I suppose the thirties were the happiest time of W.D's. life. Success and recognition had come – 1932, President of the Northern Ireland Branch of the British Medical Association; in 1936, of the Irish Medical Schools Graduates' Association; in 1937, of the Ulster Medical Society and of the Section of Medicine of the British Medical Association at its meeting in Belfast. In 1939 he delivered his Lumleian Lecture before the Royal College of Physicians, and his son Humphrey qualified.

He rejoiced in the friendships of his colleagues, especially C. G. Lowry and R. J. Johnston. When in trouble he would seek their advice which was always contradictory. If a letter of complaint came or legal action was threatened, one would be up in arms suggesting legal advice and carrying the fight to the enemy camp, while the other would just advise "burn the letter." The pacific advice was always accepted and such acceptance was never regretted.

He followed Osler's maxim – never laugh at a patient and rarely with him, but he could laugh at himself. I remember him telling us about a visit he had from a farmer and his wife. She had lost her voice – not from any local condition but apparently she just refused to communicate. The general practitioner could do nothing and she was referred to W.D. who could elicit no answer to any question. She just sat on the chair and did nothing. W.D. then tried to examine her and lifted her ankle length black skirt to test her knee jerks. She pushed the skirt down, stood up and exclaimed, "Sowl, you're a boy!" and strode out of the room. I doubt if any psychiatrist could cure schizophrenia as quickly today.

Another story which he loved telling was of an episode during finals when he and Dr. Eileen Hickey were conducting a viva. It was at a time when the toxic effects of tobacco, such as amblyopia and tremor, were a popular topic although the relationship between smoking and carcinoma of the lung had not been discovered. Dr. Eileen Hickey was doing her best to obtain a response from a candidate who, like the schizophrenic patient, had been struck dumb. He had been asked the causes of tremor and had managed to give one or two of the more common, but inspiration failed. She repeated the question in a different format: "Take a good look at Professor Thomson. If he developed a shaky hand, what would you say was the probable cause?", at which W.D. blew a cloud of cigarette smoke across the table. The unexpected response came – "senile decay". The poor candidate never expected to pass, but W.D. must have ensured that justice was done for another M.B. was let loose on an unsuspecting public.

But stupidity could bring out a different side of W.D. who did not suffer fools gladly. From time to time he would bring out the slides made in France during the First World War when working on war nephritis. After many years the stock of slides diminished to one single irreplaceable, priceless relic, which was guarded carefully and which no one else was allowed to touch. He was demonstrating it to a class and carefully placed it on the stage of the microscope and focussed. The students filed up and each was allowed to adjust the fine focussing screw. A stout woman student sat down and grasped the coarse focus screw and with one dexterous twist the objective was pushed right through the slide. What W.D. said is unrepeatable but was very descriptive.

## The Clinician

I have said that W.D. in the thirties gained fame and recognition – but for what? There is no disease or sign called after him. No new concept came from his fertile brain. He was a teacher, a scholar, a clinician – a great clinical teacher. Some of his descriptions are still remembered by his former students, both for their intrinsic worth, their literary style, and of course for the voice in which they were spoken. A former student remembers the following words and almost the exact

intonation in which they were spoken 45 years ago: "Pulsus alternans: the anguished cry of the failing heart; once heard always strive to recognise, for it does not often recur. A few weeks or at best a few months and then the picture closes".

I have been fortunate in that all the physicians I have had as colleagues in both the Banbridge and North Down Hospital Groups, have borne the stamp of W.D., and are all great clinicians. Fortunately they are handing on his teaching and example to a new generation, so that the wonderful advances of science and technology can be applied correctly at the bedside.

His papers were clinical in content and often in name: "War Nephritis; A Clinical Functional and Pathological Study". This was a report to the Medical Research Council by W.D. and H. M. Keith in 1918 – "A Clinical Study of Primary Carcinoma of the Bronchi", 1933; "Clinical Aspects of Hodgkins Disease", 1935, both in this *Journal*. The relationship between renal disease and hypertension was a problem which attracted him and which he discussed in 1933 in the *British Medical Journal*, and again in 1937 in the *Medical Press and Circular*. A broader view is taken in "Recent Advances in Medicine", written in association with Dr. Muriel Frazer and published in the *Practitioner* in 1942. In 1948 he returned to the subject of his Lumleian Lecture in 1939, Primary Carcinoma of the Lung. This was published in the *Bristol Medico-Chirurgical Journal*. In 1949 both the *Ulster Medical Journal* and the *Quarterly Journal of Medicine* published his short essay on his hero, Sir William Osler.

The thirties of course did not see the super-specialisation which we have today. All the physicians were general – Boyd Campbell and S. I. Turkington alone tried to specialise in one particular facet, but one student in my year summed up our feeling in this phrase – "The Boyder knows hearts, the Turk chests, but W.D. knows it all."

He had a great interest in diseases of the nervous system and especially in the protean manifestations of tertiary syphilis. I have been told that he devoted a whole term's systematic lectures in his early days to tabes dorsalis. He seemed to take a delight in relating some of the bizarre symptoms sometimes produced by general paralysis of the insane, for instance, the judge whose first aberrant act was to relieve himself in a corner of his own Court; and do not some of you remember him telling us frequently. "Remember, the bishop was once a student".

Someone has said that the years 1935–1945 marked the zenith of the Belfast Medical School, and, as one who qualified in 1939, I of course would agree that there was at that time a flowering both in numbers and quality that had not occurred before and has not been repeated. Those were the great years of W.D. when he was the leader of a distinguished teaching team, some of whose names I have mentioned. The only survivor of the senior medical team is Dr. Robert Marshall. On the surgical side, Professor P. T. Crymble had such men as S. T. Irwin, Bobbie John McConnell, Howard Stevenson, Harry Malcolm, Barney Purce, C. J. A. Woodside, Cecil Calvert, Ian Fraser, James Loughridge, Eric McMechan and the young Jimmy Withers as clinical associates (not to mention the other specialities). The pre-clinical foundation was soundly laid by Walmsley, Barcroft, Young and John Henry Biggart.

## Humphrey Barron Thomson

The year 1942 brought with it the death in battle of his only son – only child – whom his contemporaries remember with affection. He had followed his father to Campbell and to Queen's, where I was his contemporary and did two months residency with him in the Royal Maternity Hospital. The same economic necessity did not drive Humphrey as his father, and although his class-mates were convinced of his ability, we did not think that he worked any more than the bare minimum. Industria Murus was forgotten, but he never allowed his relationship with the Professor to influence his chances in an examination; when he failed he knew he deserved to, and when he was successful we all knew that the success was equally deserved but we all suspected that had he worked a bit harder he would have been among the leaders of the year. Neither did the relationship prevent him receiving the rough edge of many tongues. Once in medical out-patients Humphrey and I were sent into one of the small examination rooms to examine and diagnose a patient. We brought back the diagnosis of tabo-paresis and were held up to ridicule in front of the whole class for complicating a simple case of tabes and making a double diagnosis. One of us, I forget which, then had the temerity to ask the patient in front of the whole class if he had any difficulty in passing water. "No," he said, "it all comes out of my finger tip."

The Thomson Room in the Medical Library was furnished to keep alive Humphrey's memory. The plaque above the door is not easy to read but the last line is "In Arduis Fidelis".

## Alexander Fleming

This irreparable loss was borne with courage and fortitude and was perhaps lessened by renewed friendship with "little Flem", who in 1946, was the Nobel Prize Winner for his discovery of penicillin. About this time Fleming lectured in Belfast and of course he and Lady Fleming stayed at 25 University Square. Their return to England via Larne and Stranraer was memorable because on arrival at York Street Station, Fleming realised that his slides had been left sitting in the hall of 25 University Square. W.D. persuaded the station-master to delay the departure of the train while the chauffeur returned for the slides. W.D., Sir Alexander and Lady Fleming stood in front of the engine, while Lady Thomson, or Mrs. Thomson as she then was, retired in embarrassment to the railway carriage. After Fleming's death in 1955, Lady Amalia Fleming gave a bronze medal, commemorating the Nobel Prize, to Lady Thomson, who last year very kindly presented it to me. I value the medal so much that I have had it framed in silver and as an expression of my thanks I decided to try and do for W.D. what he had so successfully done for Hans Sloane. I am very conscious of my inadequacy for the task and of the many revealing details and facets I have left out. I am indebted to the published appreciations which I have already mentioned and also to many other personal communications for help in placing before you this story of a great man, and to Miss Webster and staff for producing for me W.D's. articles.

However, that is all out of context and is just following the Fleming thread in the web of W.D's. life.

After the war came the re-organisation of the medical services with multitudes of committees on which to serve – Hospitals Authority, Tuberculosis Authority, Senate of the University and the Faculty of Medicine and such small voluntary committees as the Rest Home Committee of the Northern Ireland Council of Social Service. In 1948 he became a Deputy Lieutenant for the City of Belfast. In 1949 he was President of the Association of Physicians of Great Britain and Ireland and in 1950 he was knighted. He was now approaching 65 years of age and was probably looking forward to retirement to his beloved seaside home – Seven Tides, Donaghadee, where already he had created a delightful orchard and garden.

Those of you who were at the Annual Dinner of this Society in 1950 will remember the unease which swept round the tables when it was realised that W.D. was ill and had to leave. This was changed to sorrow a few days later when his death was announced. He was buried in Anahilt in the Presbyterian Churchyard. In the adjacent church a stained glass window was later installed by his widow in memory of him, his son and father – three generations of doctors.

His memory in the Royal Victoria Hospital is kept alive by the Thomson Medal endowed by his medical friends. On one side is the crest of the Royal and on the other the Thomson crest of the buck's head and "Industria Murus".

During his lifetime he never had time to sit for a portrait, but R. H. McKelvey produced a masterpiece which now hangs in the Thomson Room and literally makes the room a memorial to Father and Son.

Lady Thomson also gave a bookcase to the Thomson Room. It had been purchased by W.D. for £100 and was greatly admired by him. The size of it makes one realise the magnitude of the rooms at 25 University Square. There are very few books in the bookcase but through the good offices of Mr. Tom Brown, Chairman of the Hospitals Authority, it contains a photostat reproduction of the manuscript and typescript of the late Professor Thomas Walmsley's famous lecture "A Basketful of Bones".

I can well remember the presentation of Walmsley's lecture in the old Anatomy Lecture Theatre, now demolished. It opened new horizons for me – medical students in my day were and probably still are, very ignorant people, devoid of all knowledge outside their own little field. I mention it now because it deals in an entirely different way with the problem of a divided community, which if you remember was the subject of W.D's. first recorded public speech, in which he said that the establishment of a single national university for the whole island would be the first step into the paths of peace. Walmsley's recipe for reconciliation was SERVICE and he pleaded that we should all beware of walled-in cities of every kind, a thought which was fully shared by W.D., especially the danger of the walled-in city of the closed mind.

I can do no better than conclude by giving the quotation with which W.D. ended his own essay on Osler. This was written by one of Osler's colleagues and if we insert the name Thomson instead of Osler we have, "Thomson's main strength lay in the singular and unique charm of his presence; in the sparkling brilliance of his mind; in the rare beauty of his character and life and in the example that he set to his fellows and his students. He was a quickening spirit".

# ROYAL VICTORIA HOSPITAL RESEARCH FELLOWSHIPS

**D.A.D. MONTGOMERY, M.D., F.R.C.P.,**
Physician-in-Charge, Metabolic Unit

Annual Oration at opening of Winter Session, October 1972

FOR NEARLY one hundred and fifty years a member of staff of the Royal Victoria Hospital has been asked to give an address to mark the commencement of the hospital year, and to welcome new students to their clinical work. Today it is my turn to be so honoured and I am aware, not only of the privilege conferred on me by my colleagues in entrusting me with this duty, but also of the responsibilities and difficulties that the task imposes. It is made no easier by my recollection of many past speakers and the qualities of learning, wisdom and wit which they displayed. Some were truly vintage performances, but alas, I fear, that through my own inadequacies 1972 will definitely be a non-vintage year.

My first duty, and a very pleasant one, is to welcome those of you who have just arrived at hospital and are commencing your third year in medicine. We give you a special word of greeting and encouragement as you enter this strange new world of hospital medicine. You have shed the sheltered academic life, but I hope you have retained the knowledge which diligent teachers have imparted to you in preparation for this transformation. Now you will come into direct contact with your fellow human beings, many of whom will be sick, suffering pain or dying. In a short space of time you will experience man's whole life-span from birth to death and the tribulations, sorrows, fears, despair, joys and triumphs that face him between these events. You will learn to treat diseases and how to give hope and encouragement to those that have them. In all this you must realise that you are heavily handicapped in your process of learning and understanding. As healthy young men and women it is difficult for you to step into other men's shoes unless you have had a close or personal experience of illness and pain and the emotions that go with them. Only by a very conscious and determined exercise of your imagination can you hope to overcome it. I urge you to cultivate this assiduously if you are to become good doctors. And by good I don't necessarily mean successful.

Perhaps at no time in its history has medicine been subjected to greater changes or stresses than in recent years. Similar changes are taking place throughout the Western world and this is especially true in our own community. Old values are being challenged. The worth of new values is uncertain. Standards of behaviour, of individual freedom and the acceptance of authority are all under scrutiny and these affect your generation with particular urgency. The doctor now has to work in an atmosphere of constant questioning and publicity. In the near future you will have a health-service commissioner or medical ombudsman leaning over your shoulder.

Nowadays more, much more, is demanded of the medical and nursing professions than ever before. More scientific knowledge, more heroic surgery, more sophisticated medicine, entail higher standards of qualification and specialist training. In our concern for these worthy objectives we may be in danger of forgetting the essential welfare of the patient. This is the ever-continuing dilemma. Technical knowledge

is not enough, nor will pity compensate for lack of knowledge or professional skill. At present there is a greater tendency to regard the patient as a complicated piece of machinery that needs repair and for us to approach him as skilled mechanics or chemists instead of real healers concerned with the whole man. If we are not careful, and I say this to my colleagues, a generation may grow up who do not know or appreciate that an essential part of medicine is in danger of being lost. Recently I came across a book which had for its title "Love Needs Care". If you turn the words round to read "care needs love" then you will have an ethic for dealing with your patients' needs that will help towards a solution of these difficulties. Caring for our patients demands the highest level of professional competence guided by a spirit of love or compassion. Unless you have this inspiration your patients will fare poorly and you will be unhappy in your chosen career. If you do possess it, you will have a motive for existence and a guide to action for the rest of your life.

You are starting your hospital work at a time when an earthquake of administrative upheaval is about to convulse the health service of the nation. Many of us wonder at the wisdom of some of the proposals. We ask is it really necessary to alter, so drastically, a service, which apart from some notable defects, works reasonably well? Nevertheless, changes there will be, and in the near future it will be your task to see that it works properly, or else you will have to pick up the pieces and start again. In this new system where organisation and managerial activity are to play such a large part, an ugly commercial attitude is creeping into medicine and the trust between doctor and patient is being eroded. In a recent editorial in the *New England Journal of Medicine*, Dr. Inflefinger writes:

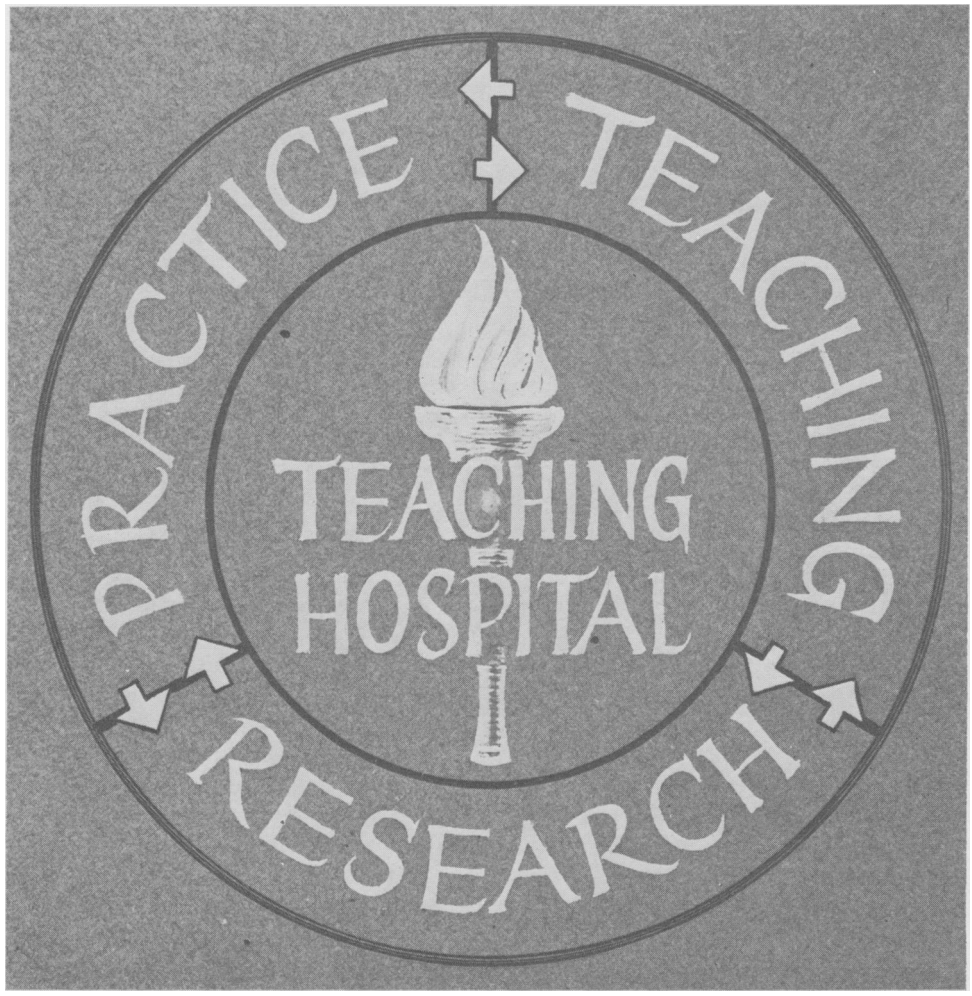
> "If trust, and particularly trust in the professional integrity and competence of the physician is fading away, who cares? Is such a trust of any consequence? Is the doctor on whom the patient places confidence any more effective than a completely impersonal dispenser of health care who gives the same advice? The answer, except when the doctor performs some technical manipulation must be an insistent 'Yes'."

If you and I believe we can give better care to our patients on a professional basis rather than on a commercial basis, then we must make exceptional efforts to sustain this professional attitude and trust. Our words and actions must constantly emphasise the difference between *our* standards and those of the politician, the industrial court or the market place. Already some of the selfishness, or what Peregrine Worsthorne calls "the general bloodymindedness" that increasingly affects the community, is brushing off on to us too. Sectional interests are beginning to predominate when we should be thinking of the good name of the profession as a whole. The desire to work less for more money seems to be a national characteristic from which none of us is immune. Such continuing great expectations or, if you prefer, simple greed, cannot conceivably be satisfied without the nation becoming bankrupt and we, as a learned profession, must revise our attitudes and return to the old standards. It is to you newcomers, fresh and uncontaminated, with your ideals intact, that we must look to maintain our true values.

During your training in hospital you will receive a great deal of instruction but

approach it with a critical mind. Be prepared to think, reason and question for yourselves. Try to make your own observations and judgements. The attitude that allows you to concentrate only on what is required to pass examinations is restricting. You should allow your mind to range freely and read widely around your subject. If you do this early, habits of thought, observation and curiosity will become so established that you will eventually want to add to the store of medical knowledge and participate in research. It is with this theme of research in hospital that I wish to devote the rest of my address. In particular, I would like to describe the work connected with the Royal Victoria Hospital Research Fellowships.

The function of a teaching hospital is to sustain and develop three interconnecting aspects of medicine. These are, treating patients or the practice of the art, teaching students and pursuing research. Each is essential and dependent on the other (Fig. 1). Good care of patients requires the active participation of those



involved to increase knowledge and to scrutinize critically the results achieved by their methods. Teaching students should compel the teacher to aim at the highest standards in communicating knowledge and in the treatment of the patients under his care. The questions of students and the teachers' inability, at times, to answer them should be an added stimulus to further study and investigation. The balance between these aspects of medicine, however, has not always been correctly apportioned in our hospital. Before the last war, practice and teaching were prominent but research was weak. There were many reasons for this. The consultants were busy men who gave their services to the hospital voluntarily and earned their living by private practice. This entailed long hours in the consulting room and in travelling throughout the province, which left little time for original work. Many were accomplished practitioners of the art and excellent teachers, but with notable exceptions, few engaged in clinical research. Facilities too, for research within the hospital, were virtually non-existent and money was too scarce to be spent on what some might have considered to be the icing on the medical cake. Since the war, however, the amount of research carried out in the Royal Victoria Hospital and the publication of the results has increased enormously. This upsurge has been due to a number of causes. For example, the number of consultant staff and registrars has increased considerably. Under the National Health Service the consultants devote the vast majority of their time to their hospital practice and some work full-time. Other facts include the stimulus of the post-war full-time professorial units and the facilities for research provided in the Institute of Clinical Science; the training and teaching of research methods to our postgraduates in other centres in the United Kingdom and abroad; the importance placed on research and the publication of papers as a measure of an applicant's professional attainments by appointment panels; and, in considerable part, to the work carried out by holders of the Royal Victoria Hospital Research Fellowships.

## Historical Background

Now, I pause for a moment to sketch in the historical background of these fellowships and to show how the idea took root and developed. Research requires financial support and the money for the fellowships comes from the hospital endowments or free funds. These investments were frozen under the National Health Services Act in 1948 but were liberated for use by the Management Committee in 1950. By 1948, the Royal Victoria Hospital had considerable assets in bequests and donations received since the stirring days, a hundred years or so ago, when the affairs of the hospital were guided by men like James Girdwood and Adam McCrory. These two, and others subsequently, provided the bones and sinews for the hospital's development. Later the creation of the Working Men's Committee in 1892 ensured that the bulk of the day-to-day expenses of the hospital could be covered by small regular contributions from work people in the city. This was the inheritance received from the past.

After 1948 when public funds provided most of the money needed for capital development and running costs, members of the Royal Victoria Hospital Committee, among whom Victor Clarendon and Herbert Quinn were leading figures, had to consider how best to utilize the substantial interest that flowed in annually from

these investments. In the first place it was decided to allocate a yearly sum of money to assist members of staff to attend conferences of especial value and to give papers at medical meetings. The committee realized early the importance of this support and the effect it would have on the development of the hospital services of the province.

It was from this farsighted concession that the concept of hospital scholarships arose. A committee of the medical staff was set up to investigate and make recommendations for financial assistance for travel. From their work stemmed the idea of providing a sum of money from free funds for hospital scholarships. The purpose was to encourage young graduates to undertake research within the field of clinical and experimental medicine and surgery. These were normally to be tenable for one year but could be renewed for a further year if thought necessary. A hospital research committee was set up to make plans for the project and entrusted with the task of examining proposals and submitting recommendations to the medical staff before seeking the approval of the Board of Management who, over the years, have given the project their generous and enthusiastic support. Men like Austen Boyd, Victor Clarendon, Albert Grant, Professor Newark and Herbert Quinn deserve our warm thanks for the way in which the scheme developed under their guidance. I am doubtful, however, if the plan would have achieved the success that it has without the wholehearted advocacy and assistance, first of Brigadier T. W. Davidson and then of Mr. R. T. Spence. Their understanding of the problems involved and the financial backing required has proved to be invaluable over the years.

From the beginning the Research Committee, under its chairmen, Dr. R. S. Allison and then Mr. J. A. Corkey, has been responsible for implementing the scheme and for supervising the work of those involved. Dr. J. A. Weaver was appointed the first Fellow in August 1955 and from then until 1972, sixty-five fellowships, nine of which have been held by women, have been awarded and almost £180,000 has been expended. When this year's budget is included the overall sum will reach £215,000. A further four new fellows have been appointed from August 1972 and six fellows in post have had their grants renewed for another year. The achievements and results of those who have completed their fellowships will be described later.

In 1957, shortly after the scheme was launched, all of us were greatly saddened by the tragic death of our friend and colleague Cecil Calvert. The medical staff recommended that an appropriate memorial would be the establishment of one of the hospital scholarships which would thenceforth be known as the Cecil Calvert Fellowship. This fellowship was intended to encourage research in the neurological sciences, a subject in which Cecil Calvert had played a leading role. In June 1957 the staff recommended that Dr. George Edelstyn be appointed to the first Calvert Fellowship. In the following year Mr. J. S. Loughridge suggested that the late G. R. B. Purce, who had been a pioneer in thoracic surgery, should be similarly commemorated. This was warmly supported by the staff and, in May 1958, they recommended that one of the Research Fellowships should be named the G. R. B. Purce Fellowship. Mr. J. B. Lowry was nominated the first Purce Fellow in 1959.

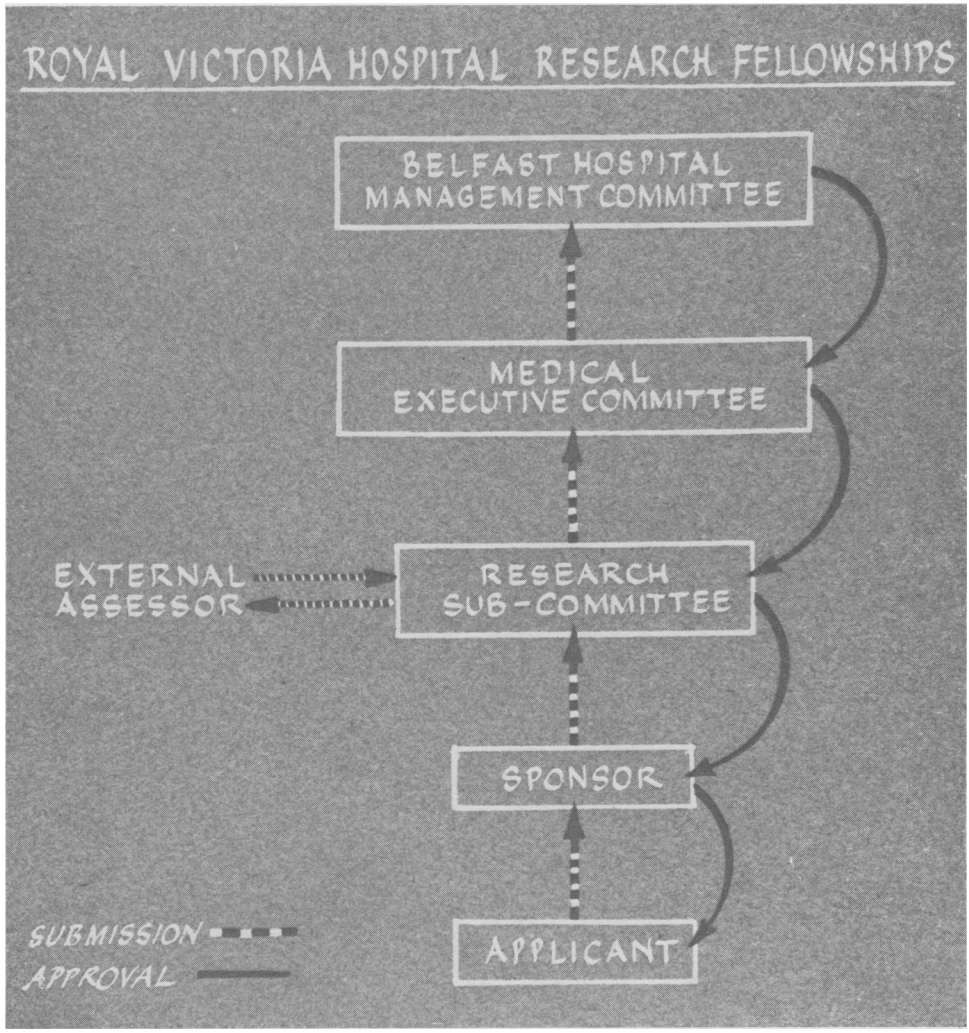
At the completion of these named fellowships the holder is expected to give a lecture, in which he not only pays a brief tribute to the man whose work is being commemorated, but also gives a dissertation on his own research before the assembled members of the hospital staff. At the conclusion the lecturer is presented with the Calvert or Purce Medal, to commemorate the occasion, by the chairman of the medical staff committee. The names of the Calvert and Purce Fellows are shown in Table I.

TABLE 1. *Calvert and Purce Fellowships* 1957–71

| *Calvert* (12) | *Purce* (8) |
|---|---|
| Dr. G. A. Edelystyn | Mr. J. B. Lowry |
| Dr. Betty Nicholl | Dr. J. A. Lyttle |
| Mr. A. McCalister | |
| Dr. R. C. Gray | Dr. I. D. Ramsay |
| Mr. G. P. Burns | Dr. P. B. Halmos |
| Dr. J. A. Dickson | |
| Dr. S. S. A. Fenton | Mr. J. E. Black |
| Mr. J. D. George | |
| Mr. S. T. D. McKelvey | Dr. M. Scott |
| Mr. A. G. Gurd | Dr. A. A. Jennifer Adgey |
| Dr. J. D. Allen | |
| Mr. A. A. Crockard | Dr. R. W. Stout |

Over the past 17 years the scheme has developed and grown into the important place that it now occupies in the postgraduate education of some of our best young doctors. Usually about six fellowships are awarded annually. When the projects are particularly promising the Board of Management has provided extra funds to support more candidates. Their generosity in increasing the total amount of money allocated has enabled us to stay abreast of inflation. Otherwise, the scheme would have foundered long ago from lack of resources, for the sum of money originally set aside would now only support one or two fellows at the most. For the current year the management committee have provided almost £36,000 – a record amount! We trust that similar sums of money (preferably with a built-in inflationary clause) will be forthcoming from the Area Health Board who will take over the management of our affairs. I hope they will prove equally dedicated to the principle of research in hospital as the present Belfast Hospital Management Committee whom they are to replace. I would make this plea very strongly for it would be tragic if financial support of this nature is withdrawn.

Over the years the work of the hospital research committee has evolved and, for those of you who do not know, I must mention briefly how this is carried out (Fig 2).




In the early part of the year applications for the fellowship are invited. These are open to graduates of all approved schools of medicine or universities. Each applicant is asked to submit his or her project, suitably written up, through a sponsor or head of department who is a member of the consultant staff and under whose guidance the fellow will work. The sponsor may or may not be responsible for originating the topic. Sometimes the applicant has the idea and approaches a member of staff to act as his or her sponsor. However, the sponsors have an important part to play in the practical management of the scheme and, without their help, it would be difficult for the committee to provide the necessary day-to-day assistance and advice that many fellows require.

When the applications are received the projects are reviewed by the committee

and the sponsor attends a meeting at which the various submissions are discussed and questions raised and answered. Only when the committee is satisfied with the feasibility of the study, that there are no ethical problems involved and that the project is intrinsically worthwhile, is a final recommendation made to the medical staff. The research committee may co-opt members of staff with special experience to obtain their advice on projects of a specialized nature or they may submit the application to an outside assessor. After their acceptance the applications are passed to the Board of Management for approval.

The financial implications of the fellowship are complicated. Since the holder of a scholarship is, for tax purposes, considered to be a full-time student, he is exempt from paying income tax. Thus, if he were paid according to his grade within the Health Service there would be a distinct financial advantage in the holding of a fellowship. Since this extra incentive was thought to be undesirable, a number of arbitrary stipends were selected so that the holder receives a sum of money roughly commensurate with the salary of his grade within the Health Service after deduction of tax. Each pay increase for junior staff has imposed a strain on the financial resources of the free funds but the Management Committee, greatly to their credit, has honoured each of them in full. Money for technical assistance when required, equipment, travel and the cost of reprints of publications are provided on a generous scale as well.

In 1971, the Royal Victoria Hospital research committee was dissolved when the present so-called cogwheel system of medical committee structure came into being. A new committee was set up to cover the research needs of the group as a whole. It functions as a sub-committee of the medical executive committee and includes a nucleus of members of the old Royal Victoria Hospital committee strengthened by representatives of the other hospitals in the group and the dental staff. When the new committee took over responsibility for the group they recommended that the Management Committee should make additional funds available to meet the research needs of the other hospitals and that monies, previously set aside for the Royal Victoria Hospital, should remain committed to that hospital. This was accepted by the Management Committee as a guiding principle for the future allocation of funds.

Now to return to the work of the fellows. Six months after commencing their research they submit a written report of their progress and are interviewed by members of the committee. The objectives are to ascertain how the work is proceeding, to try and resolve difficulties that may have arisen and to ensure that the fellows are pursuing their work diligently. Similarly, a written report and interview is required at the completion of the fellow's tenure of the post. The research committee meets at other times to conduct business arising from the administration of the research scheme, to recommend the award of the Calvert or Purce fellowships and to arrange the lectures associated with them.

This, then, is the way the research scheme has developed over the last 17 years. Like so many institutions it has evolved gradually and pragmatically. No single person has been responsible for sitting down and planning the scheme as we find it in operation today. Much of the credit of getting it under way must go to Dr. R. S. Allison and Professor M. G. Nelson. Little, however, would have been

accomplished without the enthusiastic support of the members of the hospital committee and Board of Management, and the altered financial standing of the hospital. The times were ripe for this forward step.

Having sketched in the background history of the hospital fellowships, I now propose describing in greater detail the achievements of the fellows themselves. When you hear these you will be in a better position to judge the worth of what has been done. Has the experiment proved successful?

The purpose of my investigation was to obtain information from the fellows about their experiences and their assessment of the value of the fellowships. In particular, I tried to obtain information on the following aspects:

1. Their views on the facilities provided for the research project.
2. The adequacy of the supervision provided by the sponsor.
3. Satisfaction or otherwise with the fellowship as
   (a) an experience in postgraduate training and introduction to research methods;
   (b) a stimulus for further research in their subsequent careers.
4. The effect, if any, that the fellowship had on their career prospects.

Questionnaires covering these and other aspects were sent to the 64 fellows alive at the time of writing. Sixty-two replies were received – a 97 per cent response. Many of you will be aware how difficult it is to draw correct conclusions from answers to a questionnaire no matter how it is worded. But from the replies and my experience on the committee over many years, I think the following views are probably warranted (Table II).

TABLE II. *Analysis of replies received from 62 fellows 1955–72*

| *Aspect of Fellowship Investigated* | *Satisfied* | % | *Dissatisfied* | % |
|---|---|---|---|---|
| Physical facilities for the research project | 46 | (74) | 16 | (26) |
| Supervision by sponsor | 52 | (84) | 10 | (16) |
| Experience of fellowship as postgraduate training and introduction to research (Excluding 6 fellows in post) | 50 | (89) | 6 | (11) |

Forty-six (or 74 per cent) fellows were satisfied with the physical facilities provided for their research. This included space for work, laboratory bench space, animal facilities, equipment, clinical access to patients, technical assistance and statistical help. Sixteen (or 26 per cent) fellows expressed dissatisfaction or had reservation. These were as varied as the fellows themselves. Some complained that accommodation was provided on a grace and favour basis. One fellow wrote that accommodation was provided only by bartering co-authorship of possible publications. By implication they were critical that there is very little space available for research purposes within the hospital. Five fellows, four of whom were carrying out surgical research, while satisfied with the accommodation provided, found their

work hampered by lack of technical assistance or had problems with their equipment. One remarked that technical assistance is often provided at a very junior level and that help of this nature is often a hinderance instead of an asset.

Granted that research accommodation is very limited, how has space been provided for those who expressed their satisfaction? In part, University departments with clinical responsibilities have come to the rescue. The closeness of the Institute of Clinical Science to the hospital has been invaluable and we owe the University a debt of gratitude for their help. The close liaison between the hospital and University has been further strengthened by including several clinical professors on the research committee. Of course, the debt is not one-sided, for University departments have found it useful to sponsor young graduates in a line of research that complements or extends their own work. Hence the scholarship scheme has been of great value in providing funds for research for holders of joint University and hospital appointments. Some fellows have found shelter in laboratory areas, especially in biochemistry and haematology, or have been accommodated within their sponsor's department as in cardiology, metabolism and neurosurgery. However, it is clear that space for research within the present hospital premises is grossly inadequate. I hope those responsible for the replanning of the new Royal Victoria Hospital will remember this need and give it priority when they draw up their plans for rebuilding.

I have already spoken of the important part played by the sponsors in the fellowship scheme. Certainly some of the success that has been achieved has been due to the generous guidance and help that they have given to fellows under their supervision. Fifty-two (or 84 per cent) of the 62 fellows expressed their satisfaction with the help they received from their sponsor. Most answered the question with a simple "Yes" but others were more specific. One wrote: "Most helpful and more than adequate"; another: "Absolutely first class." "My sponsor's interest and encouragement was a tremendous help to me" was the comment of a third.

Five, while expressing approval, qualified their remarks. For example, one wrote: "Plenty of encouragement but not enough expert informed criticism." Others were less specific and were perhaps too polite to express themselves more freely. Ten fellows (or 16 per cent) were dissatisfied with help received from the sponsor. Four answered the question in the negative but gave no reasons. The others were more explicit. The main cause for criticism was that the project was outside the experience of the sponsor and hence proper supervision and advice could not be given. Two fellows felt that their sponsor did not have sufficient time to see them at regular intervals and felt isolated.

The vast majority of fellows were satisfied and happy with the fellowship as an experience in their postgraduate training and as an introduction to research and the problems connected with it. Fifty (or 89 per cent) of those who had completed their fellowship expressed unqualified satisfaction with the experience and this, too, appears to be the attitude of those in post. Many were warm in their praise but I can only give a few examples:

> A non-Belfast graduate, now a consultant in England, wrote: "I was given magnificent equipment and allowed to travel in order to learn how to use it. This alone saved me six or nine months of work. I have been disappointed subsequently by the facilities for research offered to me and

feel that none of my work has been of the same quality as that done in Belfast."

Another, writing from America, said: "You will see I am enthusiastic about the R.V.H. Fellowship – indeed, I would not be here if I had not the good fortune to obtain a fellowship to start my research. I know that junior doctors in many other British teaching hospitals do not have the same opportunity and are envious of the facilities offered by the R.V.H."

A third wrote: "I believe that these fellowships contribute greatly to the postgraduate education of doctors in the province and I would be dismayed if any move was made to abolish them."

Another qualified his support by remarking that candidates for a research grant should have obtained their Membership or Fellowship first. In his own case he became involved in research before obtaining a higher qualification and found himself divorced from clinical work, while at the same time still feeling the necessity to read for the examination. This view is generally supported by the research committee.

Six fellows (or 11 per cent) found their fellowship unrewarding and counted the experience a failure. Their reasons are interesting. One was given support for a short stop-gap period early on for what seems to have been an inadequately prepared project. The fault was primarily the responsibility of the research committee and not that of the individual. As he said: "I should probably not have had a research fellowship". Fortunately, the experience did not prevent him from subsequently leading an active and productive career in a combined clinical and academic post.

In three others the selection of the subject was unwise and inadequate preparation and supervision meant that no useful purpose was achieved. One of these fellows found it to be a complete waste of time and wrote: "My project was not prepared adequately to be productive". For these the blame can be apportioned equally between the applicant, the sponsor and the research committee. The latter bears a heavy responsibility for ensuring the viability of every project recommended for approval. A fifth fellow was unable to complete his work because of personal circumstances. The critical views of the remaining fellow are too long to quote in full. He questioned the whole ethos of the scheme pointing out that medical research seems to have become a sine qua non to hospital career advancement, despite the fact that many doctors (as he put it) are neither suited for this type of work nor happy doing it. Certainly these are valid criticisms but the fact that most fellows enjoyed the experience and found it valuable suggests that the committee, on the whole, chose the applicants wisely. Nevertheless, we must be on our guard against forcing individuals into medical research who are unsuited for it or unwilling to embark on it. Some of this pressure might be relieved if selection panels attached less importance to the candidate's publications when selecting a man for a consultant post.

The assessment of aptitude for research in those who have had no previous experience of it has exercised the research committee over the years and we have not found a reliable yardstick to measure this intangible quality. The individual who comes with a well thought out idea shows the greatest promise. On the other

hand, the person who needs the stimulus of an idea from his sponsor is not necessarily suspect. Some are extremely good in doing the necessary spade work but the man who knows where to dig the first sod is rare and should be given every encouragement. Some further qualifications and opinions expressed by those who found their fellowship useful deserve attention. Several thought it was important to chose a subject which was within the established research pattern of the hospital or University department. Great difficulties could be experienced when a fellow tried to break new ground. Some fellows felt isolated from other colleagues working on Authority or Medical Research Council scholarships or University research, and said they were often unaware of what was being done elsewhere in the region. In some instances they could have received advice or help from others who were working in allied fields. To some extent this isolation may be minimized by the recent introduction of research seminars to provide a forum for the exchange of ideas and presentation of current research within the hospital group and associated University departments. Several research fellows have participated in this way and I hope it will continue to enjoy the support, not only of the Research Committee but of all members of staff and senior students.

Recording and writing-up the results of clinical investigation forms an important part of the discipline of medical research and provides valuable training for the postgraduate student. Royal Victoria Hospital fellows have made an impressive contribution to the medical literature. Forty-four (out of the 62 who replied) published 124 papers connected with the subject of their study. Six who are still in post are not ready to report their results, and 12 fellows at the time of analysis have not written anything, although some are preparing papers. Thus, the number not publishing results is unlikely to exceed seven in all. It is impossible to say whether the projects which resulted in the publication of papers were superior to those which were less fruitful in terms of medical writing. Some individuals have greater facility for writing than others. It is noticeable that the fellows appointed recently have been more productive in this respect than their colleagues who obtained their scholarship earlier. The advantage to the fellow of working in collaboration with a sponsor who is contributing regularly to the literature can be clearly seen.

Thirty-five fellows were awarded higher academic degrees as the result of work carried out during their fellowship. These included 22 M.D.'s, 9 M.Ch.'s and 4 Ph.D.'s. Six theses are in course of preparation or have been submitted to a university for acceptance. When allowance is made for the fellows in post and two who already had doctorates, 61 per cent of the fellows obtained a higher degree. This figure will rise to 72 per cent if all the theses presently being prepared are successful.

Thirty-nine fellows who published papers or obtained a higher degree have continued to carry out research and write during their subsequent careers. If we exclude the fellows in post and four others who have just recently completed their work, there are eleven fellows who have not continued with any form of clinical or academic research. Of those maintaining an interest in research, six have each published over 20 papers; four of these over 50. A further six have produced between 10 and 19 papers, and 27 an average of four papers each. Many of those replying to the questionnaire attribute their continuing interest in research to the

stimulus gained while holding the fellowship. There is little doubt that the experience creates habits of observation and thought and a dedication to medical research that probably lasts for a lifetime. The views of one fellow sum this up succinctly. He writes: "The fellowship provided me with my first opportunity to engage in full-time research. As a result of this I have continued to devote a major portion of my efforts in this direction". Two fellows have made a career in full-time research and one is at present holding a research fellowship in America.

Many fellows considered that their fellowship had contributed materially to their career prospects. Table III shows their present posts. The nine fellows in academic teaching posts include two associate and one assistant professor in America. There are two senior lecturers with consultant grading and two lecturers in Northern

TABLE III. *Careers of* 65* *R.V.H. fellows*

| | | |
|---|---|---|
| Consultants | | 29 |
| Physicians | 13 | |
| Surgeons | 9 | |
| Anaesthetists | 2 | |
| Pathologists | 2 | |
| Radiologists | 2 | |
| Radiotherapist | 1 | |
| Full-time Research | | 3 |
| Academic Teaching Posts | | 9 |
| Senior Registrars or Equivalent | | 16 |
| Fellows in Post | | 6 |
| General Practitioner | | 1 |
| Not Working (Housewife) | | 1 |

*One fellow deceased

Ireland, a senior lecturer in New Zealand, and a first assistant in a surgical professorial unit in England. The views of the fellows in this respect varied. A number felt that the attainment of a higher academic degree, for which the fellowship provides an opportunity, is a help in obtaining a post in a teaching hospital. Other views were more individual. One wrote that the fellowship had helped him to create and pursue a career in academic medicine. Another remarked that he had become known in this special field through writing papers and giving lectures connected with his research. A third considered that the opportunities to learn basic research techniques, the design of experiments and the statistical approach to analysing results added greatly to his postgraduate training and subsequent career.

Finally, three other comments are worthy of attention. One fellow in post considers that the number of doctors who would have left the hospital to do their research elsewhere is greatly reduced because of the facilities provided by the fellowship. The present scheme is a strong incentive for them to stay at home.

One is reminded of Charles Colton's truism that "Imitation is the sincerest of flattery", when one fellow wrote: "Two years ago a similar fellowship was instituted in our hospital and is proving very productive". A third with probably the same idea in mind said: "These fellowships represent money well spent. The lack of similar facilities is a serious handicap in the development of my present hospital."

These then are the views of the fellows themselves. I think we can justifiably conclude that for them the experience has been of immense value, not only as a feature of their postgraduate training but also as an introduction to research methods and the creation of new ways of thought and interest for the majority in their future careers.

On the other side, I would like to examine the contribution made by the fellows and their research to the hospital and community in general. For those who have to provide funds the quetion "Have we had value for money?" must often arise. I think I can reassure them that solid achievements have resulted, though the dividends of medical research are not always immediately obvious. Sometimes we do not receive the benefits directly because fellows may leave and take their experience and skills elsewhere. This exchange of talent, however, is of considerable value to the total sum of medical research. If we gain from research performed elsewhere we must be equally generous and prepared to give part of our contribution to others without stint.

Now, I propose to mention some of the benefits that the hospital and patients have received from the scheme. Times does not permit me to mention all and my selection is necessarily arbitrary and not in order of merit. Indeed, the latter would be quite beyond my powers, for the value of any research cannot be assessed properly over the brief period of my review.

The present Respiratory Failure Unit stems largely from work carried out by a fellow on the management of respiratory failure. By a happy chain of circumstances the need for a respiratory failure unit was recognized as the work was completed, the man was ready and trained for the post, and support was forthcoming from the management committee. This department has proved to be of great value to the clinical work of the hospital and most of you will know what an important part it is playing in caring for many of our seriously wounded and injured fellow citizens.

In other fields, research fellows have carried out work or established new techniques of investigation or treatment which now form part of the standard practice of the hospital. For example, all of us are proud of the reputation of the Department of Cardiology, and over the years a group of young and gifted fellows have been fostered and trained in this specialty. Some of the present cardiological practice in the Province stems from research which they have carried out in this sphere. Mention, too, should be made of neurosurgical methods of investigation and treatment carried out by Calvert fellows. These have included pituitary ablation in the management of breast cancer, the use of ultrasound and radio-isotopes in the investigation of cerebral function, and recently, research into new techniques for studying cerebral biochemistry and vascular dynamics in severe head injury. All these have added materially to the safety of the patient and the ability of the neurosurgeon to practise his craft.

Many standard biochemical, haematological and radioisotope tests, now performed regularly, originated from investigations carried out by research fellows. For example, some of the routine radioimmunoassay tests for polypeptide hormones developed out of the original work on growth hormone carried out by a fellow. Other radioisotope tests in biochemistry and haematology were established by fellows. For most of you the term "breathalyser" has an ominous ring. A similar kind of test, although performed without the assistance of the Law, has been adapted for estimating the excretion of fat in the stools. The method, which avoids unpleasant and tedious work in the laboratory, was established by a fellow working in collaboration with the Medical Physics Department.

The first electromyogram performed in this hospital was done by a research fellow working on the muscle disorder of thyroid disease. On completion of his work the equipment was handed over to the late Dr. L. J. Hurwitz. He, together with several fellows, used it for the investigation of various muscle diseases and nerve conduction studies. From such small beginnings the neurological EMG service of the hospital developed.

Parallel with these, a series of excellent studies in surgical gastroenterology have continued over the whole term of the fellowship scheme. Some of the methods that have been evolved, such as the measurement of gastric emptying, have become part of the routine investigation of patients with gastrointestinal disorders.

Because of these and many other examples which I could mention, I think you will realise that the Royal Victoria Hospital fellows have produced work of importance and worth and that they have helped to keep this hospital in the forefront of medical research. The money, you can see, has been well spent.

This, then, is the fellowship scheme as it has developed since 1955. What more can we do to assist it to a greater level of excellence? Some aspects need attention and I hope the necessary support will be forthcoming from the Area Health Board to enable them to be met. Without adequate finance and facilities the scheme will wither.

1. Firstly, then, we must make provision for research facilities and laboratories within the hospital area. These need to be properly equipped and staffed to provide adequate technical assistance when needed. Facilities for animal experiments must be available and the requirements of the research fellows should be remembered by the committee of the Faculty of Medicine which is investigating this subject.

2. Secondly, within our own sphere of responsibility, the Research Committee, in association with the sponsor must be prepared to spend more time in guiding the choice of project and in selecting and advising on the methods of study. The sponsors must have a detailed interest in and knowledge of the projected study so that they can guide the work properly. It is a privilege and responsibility in which we all can share, but no one should undertake it without considering the cost in time and energy. The applicants themselves need to spend greater thought and time in working out the details of their project and choose their sponsor wisely. It is a mistake to allow an individual to launch out into a specialised and solitary channel of research. It is better for him to work as part of a team which has an interest or experience in the field to be studied. Completely new projects, which fall outside the research experience of the hospital, are most likely to founder because of inadequate help and guidance.

3. Thirdly, we must all endeavour to create a climate within the hospital which attracts young doctors into research because it is an interesting and exciting thing to do and likely to benefit their patients, rather than being a dutiful chore to get through in order to advance their career.

4. After completion of their project, fellows should receive active encouragement to engage in further research. This will require additional funds from public sources. This year the Northern Ireland Hospitals Authority is spending £50,000 on research for the whole province. When one considers this sum in relation to what is being spent in our own hospital and the overall cost of the health services, it is obvious that more money must be provided. In fact, it forms 0.15 per cent of all the money spent on running the hospitals in Northern Ireland. Even if you add to it the money spent on the Royal Victoria Hospital fellows and Medical Research Council money spent in Northern Ireland the percentage rises to only 0.45. The equivalent amount provided from public funds for the rest of the United Kingdom (viz. from the Medical Research Council and the Department of Health and Social Services) is six times more, approximately 2.7 per cent of the cost of the hospital services. Medical research in Northern Ireland needs to get the support it deserves; it has been and remains the Cinderella of the Health Service.

These then are some of the ways we can improve the scheme. Medical research is rather like making a Byzantine mosaic. Most of us, if we are fortunate, may add a chip or two to the unimportant background. A few gifted people are able to fill in some of the intricate design but it is only a creative master, like a Pasteur or Fleming, who can put in the face with all its subtleties of design and colour. The best that most of us can do is to make some modest contribution to medical knowledge within the degree of our own competence, but at least we should do that. The art of medical research requires patience and dedication, but the rewards of diligence are great. It is like gazing into a deep well because the longer you look the brighter shine the stars in reflection.


## Acknowledgments

I am grateful to the Royal Victoria Hospital Fellows for replying to the questionnaire and for their helpful comments. Dr. R. S. Allison (Hospital Archivist) provided some of the historical material and I appreciate his assistance and advice. Professor R. A. Macbeth, Chairman of the Department of Surgery, University of Alberta, kindly allowed me to read published and unpublished observations on the experience of research fellows who had worked in the Department of Surgery. I greatly value his courtesy in allowing me to benefit from his investigations. Professor R. B. Welbourn generously allowed me to read his lecture on "Science and Surgery" and introduced me to Professor Macbeth. I am grateful to Dr. J. Andress, Senior Administrative Medical Officer, Northern Ireland Hospitals Authority, Mr. C. A. Kirkman of the Medical Research Council and Mr. R. T. Spence, Secretary, Belfast Hospital Management Committee for information about the amount of money expended on research in Northern Ireland. I am especially indebted to Miss May Weller who provided so much secretarial help and typed the manuscript. My thanks are also due to Mrs. Cheryl Milligan and Miss Deirdre MacIntyre for obtaining information from Medical Staff Minutes; and Mr. G. A. Smith (Hospital Artist) and the Photographic Department for the illustrations.

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# THE SEVERE HEAD INJURY: METHODS OF ASSESSMENT

The Calvert Lecture: 1971

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*Cecil Armstrong Calvert has been regarded as one of the most outstanding men the Belfast Medical School has produced, graduating with First Class Honours in* 1922. *He was a clinician and surgeon of international reputation.*

*He was the founder and Director of the Department of Neurosurgery in this, the Royal Victoria Hospital, until his untimely death in* 1956, *and he tirelessly devoted his time and energy to the treatment of his patients and the training of his staff.*

*During the war he established, with Sir Hugh Cairns, a Head Injury Centre at Oxford—the first of its kind in Britain.*

*His most significant contributions to medical knowledge were in the field of head injuries: he developed methods of treatment for compound fractures of the base of the skull which are standard treatment to-day. This present research would have been of special interest to him.*

## Introduction

Trauma is the epidemic of this age and takes a heavy toll where tuberculosis and plague were once the giants. It, too, carries away the young and those in the prime of life, for well over half the victims are less than 30 years of age (Gögler, 1965).

Head injury is responsible for 70 per cent of the deaths which follow trauma, but the unpredictability of the condition makes the prognosis uncertain and leads to doubts about the benefit of different treatments. In coronary artery disease the value of objective measurements and continuous monitoring of cardiac function have been clearly demonstrated (Adjey et al, 1971). In head injury care, where we deal chiefly with young patients, it is now appreciated that monitoring of cerebral function should accompany clinical assessment. The investigations to be described were an attempt to enlarge our understanding of the natural history of this condition and to improve the evaluation of treatment.

## History

The study of head injuries is one of the earliest projects undertaken in medical history dating from 3000 B.C. In excavations in Peru, skulls have been found with evidence of healed trepanation beside fracture lines—showing that the procedure was carried out during life and with a degree of success. Indeed, of the 400 or so skulls found, some 60 per cent showed signs of healing, (Tello, 1913). The earliest written accounts of head injuries are in the Edwin Smith papyrus of 1400 B.C. At that time doctors plainly had decided which patients had a good prognosis.

In this, the first text book of medicine, 19 patients with head injuries are described, and clear instructions on treatment are given. Patients fell into three categories :

(a) Those who would recover without treatment;

(b) Those who might recover and therefore could be treated;

(c) Those who were not to be treated because of a hopeless prognosis.

The penalty for not following this advice ranged from a fine of 10 shekels of silver to amputation of the right hand (Horrax, 1952). This advice is still applicable, but the determination of these categories—those who will improve and those who will die—has exercised medical minds for centuries. Hippocrates said : "No head injury was too trivial that it should be ignored, or too severe that it be despaired of". But, 2,400 years later, Penfield had little further to add to this broad generalization saying : "It must be decided initially whether or not the prognosis is hopeless, but the criteria which may be said to mark a case as 'hopeless' are few" (Penfield, 1941).

In the last few decades the electrical activity of the brain, as detected by EEG, has been used in the study of severe head injuries. Changes accompany improvement in clinical condition; an absolutely flat record usually indicates brain death; but in this field the test's value has been limited. In recent years other parameters such as intracranial pressure, cerebral blood flow and biochemical changes in the cerebrospinal fluid have been studied. They will be described in a later section.

## Pathophysiology

As has already been suggested, the severe head injury is a dangerous condition with a mortality of between 50-70 per cent. Surprisingly few patients who die from head injury have large intracranial haematomata. Naked-eye autopsy examination of the brain usually reveals very little abnormality. Microscopically, however, Strich (1956) and Nevin (1967), identified diffuse areas of damage in the brain. They describe groups of damaged axons in the white matter and areas with neuronal death surrounded by zones of cedematous cells. Normal brain tissue lies between the damaged areas. The changes resulting from the initial injury are serious enough but, as the skull is a closed compartment, a vicious circle of rising pressure becomes established. Trauma results in oedema which raises intracranial pressure, oedema reduces the blood and oxygen supply to sick cells, the resulting ischaemia promotes further oedema. As cerebral oedema is an undesirable consequence of the head injury, the object of treatment is a reduction of intracranial pressure and improvement in the blood supply to the tissues most requiring it. This basic pathophysiology leads us to investigations in patients with severe head injury.

1. *Intracranial pressure monitoring.* Control of cerebral oedema reduces intracranial pressure. A low pressure therefore becomes the aim of treatment.

2. *Biochemical studies of cerebrospinal fluid (C.S.F).* CSF is the extracellular fluid of the brain cells. Abnormal levels of metabolites indicate the extent of cellular damage and have a bearing on prognosis.

3. *Cerebral blood flow.* Cerebral oedema reduces the blood flow; changes in flow provide an indication of the severity of cerebral oedema, and to some extent show the effect of treatment.

## METHODS

As intracranial pressure, nutrition of brain cells and cerebral blood flow are so closely related, it seemed reasonable to measure all three simultaneously in severe head injuries.

### 1. *Intracranial Pressure (ICP)*

Isolated pressure measurement by lumbar puncture was used initially but was unreliable (Quinke, 1891). A small, intracranial pressure device has now been developed which allows continuous pressure recording. The model used is a silicon beam planar resistor type of strain gauge, (Ferranti & Akers). The device is placed in the subdural space through a burr hole. It is quite small and does not damage the cerebral cortex. The pressure transducer is connected to a battery-operated amplifier and a slow running chart recorder. The transducer can be left inside the head for 10 days and is easily removed by cutting out the retaining stitch. This equipment has recorded intracranial pressures as high as 100 mgHg which is 10 times normal, (or the equivalent of five lumbar puncture manometers placed on top of each other). The rate of change in intracranial pressure is perhaps, more important than the actual levels. Breath-holding or coughing can raise the pressure to 25-30 mmHg, (that is, two to five times normal), and similar changes can accompany induction of anaesthesia and endotracheal intubation. The effects of different forms of treatment, to be described later, can be assessed by these pressure changes.

### 2. *CSF Biochemistry*

The vicious circle of oedema and raised intracranial pressure increases the damage to injured brain cells. Normal cells require glucose and oxygen which are metabolized to carbon dioxide and water. Injured and ischaemic brain cells lack oxygen; their deranged metabolism leads to the accumulation of lactic acid. This metabolite accumulates in the CSF in amounts which depend to some extent on the number of injured cells. A correlation between CSF lactic acid level and prognosis in head injuries has been suggested by Kurze et al, (1966). But the actual levels and the length of time the levels were raised has not been evaluated.

In 38 severe head injuries, serial samples of CSF were obtained by lumbar puncture. If intracranial haematoma was suspected, lumbar puncture followed operation. The CSF sample obtained was divided into three parts : one for lactic and pyruvic acid estimation, the second for Astrup estimation, and the last for protein and red cell content. The pressure was also measured and compared with the intracranial pressure values. Samples were obtained daily or, in some cases, twice daily. The values obtained in 18 of these are shown in Fig. 1. The values of lactate rapidly fall after the injury, in fact, the higher the level, the more rapid the decline. Normal values were 10-15 mg. per cent in our studies, while some patients had values up to 12 times normal levels. In all the samples studied, (with the exception of those with gunshot wounds), no patient has survived with a lactate level above 55 mg. per cent and no patient died of his head injury with a lactate value of less than 25 mg. per cent. So from this study it is felt that the levels of lactate in the CSF provide a valuable prognostic test (Crockard & Taylor, 1971).

The graph in Fig. 1 shows the importance of obtaining the CSF sample within 24 hours of injury. Levels between 30 mg. per cent and 55 mg. per cent are of

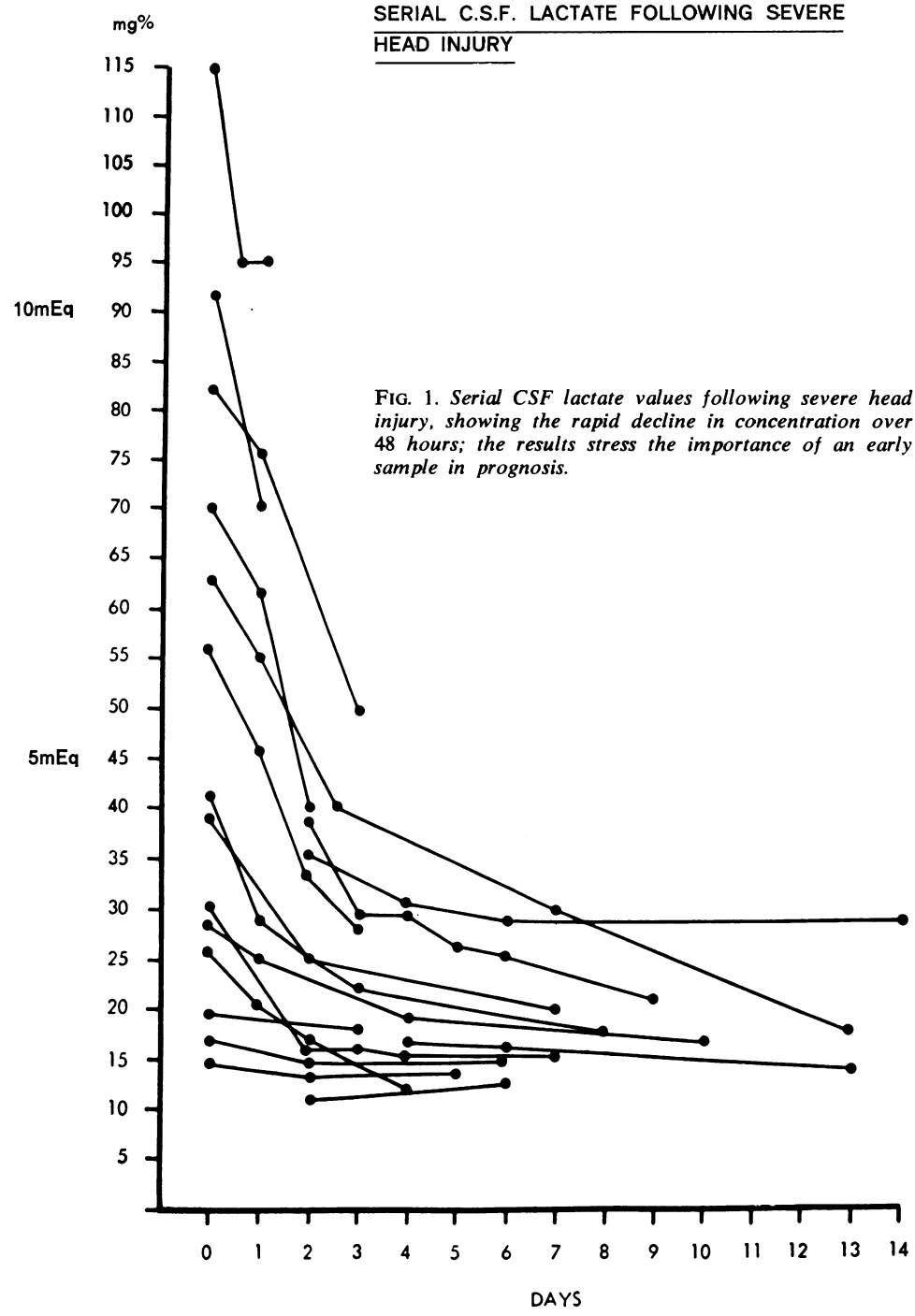


FIG. 1. *Serial CSF lactate values following severe head injury, showing the rapid decline in concentration over 48 hours; the results stress the importance of an early sample in prognosis.*

uncertain prognostic value. When a patient with lactate levels in this range dies, he has usually presented with decerebrate rigidity, respiratory difficulty and hyperpyrexia. The relatively low lactate level suggests brain damage limited to a small, but vital, area.

Taking the highest results obtained from all 38 cases, there is a marked difference in the CSF of those who died and the survivors, (Table 1). The lactate level in those who survived was significanlly lower, and the lactate/pyruvate ratio was half that obtained from fatal cases. The CSF was also much more acid in those who died; in survivors the CSF pH remained about normal. The increased CSF acidity may explain changes in respiration and cerebral blood flow, as pH is important in the regulation of both. The rapid fall in CSF lactate levels is not unexpected; as the damaged cells which produce lactate die or recover, the metabolite enters the blood stream where it is metabolized. But, if the brain damage by increasing cerebral oedema continues, further anaerobic glycolysis produces more lactate. In three patients with massive intracranial haematoma, the lactate levels rose to over 55 mg. per cent just before death.

Serial study of CSF lactate levels thus provides useful prognostic data. Abnormal metabolism caused by increasing cerebral oedema can be detected; a level over 55 mg. per cent is usually incompatible with survival.

TABLE I

*Mean values in* 38 *cases of severe head injury, showing CSF changes associated with a good and a bad prognosis (lactate, pyruvate and bicarbonate values are in mEg/L).*

| | *Lactate* | *Pyruvate* | *L/P* | *pH* | *Bicarbonate* |
|---|---|---|---|---|---|
| Alive | 2.98 (26.8mg%) | 0.16 (1.42mg%) | 33.8 | 7.31 | 21.36 |
| Dead | 6.34 (57.1mg%) | 0.18 (1.61mg%) | 61.1 | 7.17 | 16.5 |

### 3. *Cerebral blood flow*

The techniques for measuring cerebral blood flow have grown more and more sophisticated, and now the classical method of Lassen & Ingvar (1961) involves an intracarotid injection of Xenon, monitored by 32 computer-linked collimators. Because of the difficulty, the potential hazards, and the limitations of the procedure, in Belfast we have concentrated on the less exact but simple, atraumatic and easily repeatable technique of Radiocirculography (RCG). The method was developed by Oldendorf in 1962 and pioneered by Taylor (1966). Basically the method is as follows :

Into an antecubital vein a very small quantity of a radioisotope (Technetium 99) is injected below an inflated cuff. This is rapidly released and the passage of the radioactive bolus, or "slug", is monitored over the praecordium and then the head.

The radiation is detected by collimators over the praecordium and two situated to look at the cerebral hemispheres individually. As the isotope passes through the heart and lungs, the radioactivity is measured and expressed graphically (Fig. 2). As it passes through the head another curve is obtained. The time taken for the

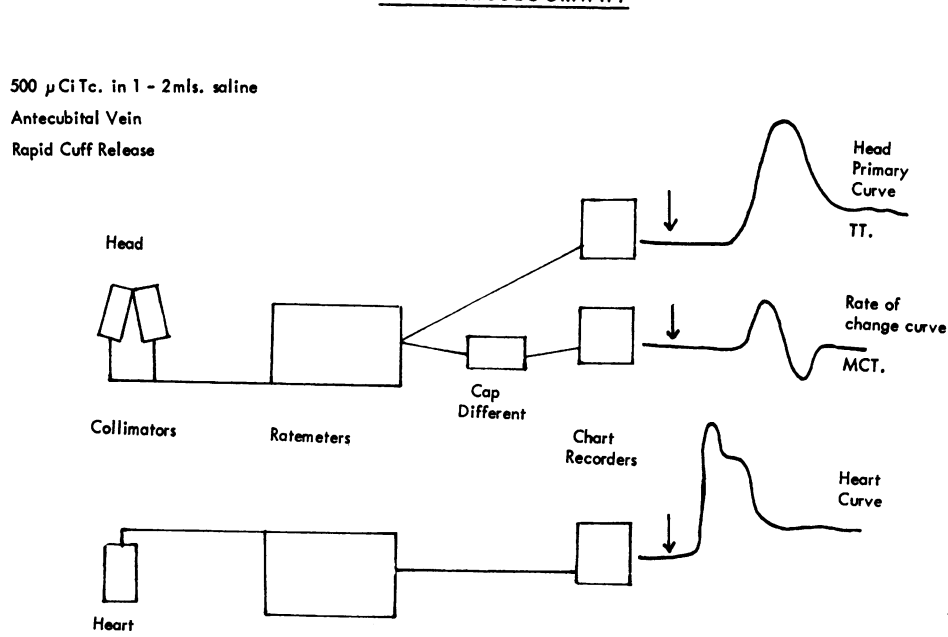


FIG. 2. *Radiocirculography (RCG). The head is placed on the angled collimators prior to injection of the Technetium (Tc 99m). As the radioisotope "slug" passes through the heart and head, a primary curve is obtained. The length of this curve provides a Transit Time (TT) for circulation; its derivative a Mean Circulation Time (MCT).*

isotope to pass through the head is known as the Transit Time (TT). A differentiated curve obtained from this primary curve provides an average circulation time through the brain, or Mean Circulation Time (MCT). In simple terms, the better the blood flow, the shorter will be the Transit Time and the higher will be the amplitude of the curve. Conversely, a low amplitude and a long TT denote a poor cerebral circulation. Obviously cardiovascular disease will influence cerebral circulation and the praecordial monitor allows a correction factor to be used.

As the skull is a rigid, closed box, very high intracranial pressure adversely affects blood flow. After reduction of the pressure, blood flow improves. This, in theory, is what happens when an extradural haematoma compresses the brain. Several patients have been studied serially before and after operation; the predicted improvement in blood flow followed removal of the haematoma (Fig. 3). With the two collimators scanning each cerebral hemisphere separately, similar changes have been noted in hemispheric blood flow after removal of a subdural or intracerebral haematoma and aspiration of abscess or cystic tumour.

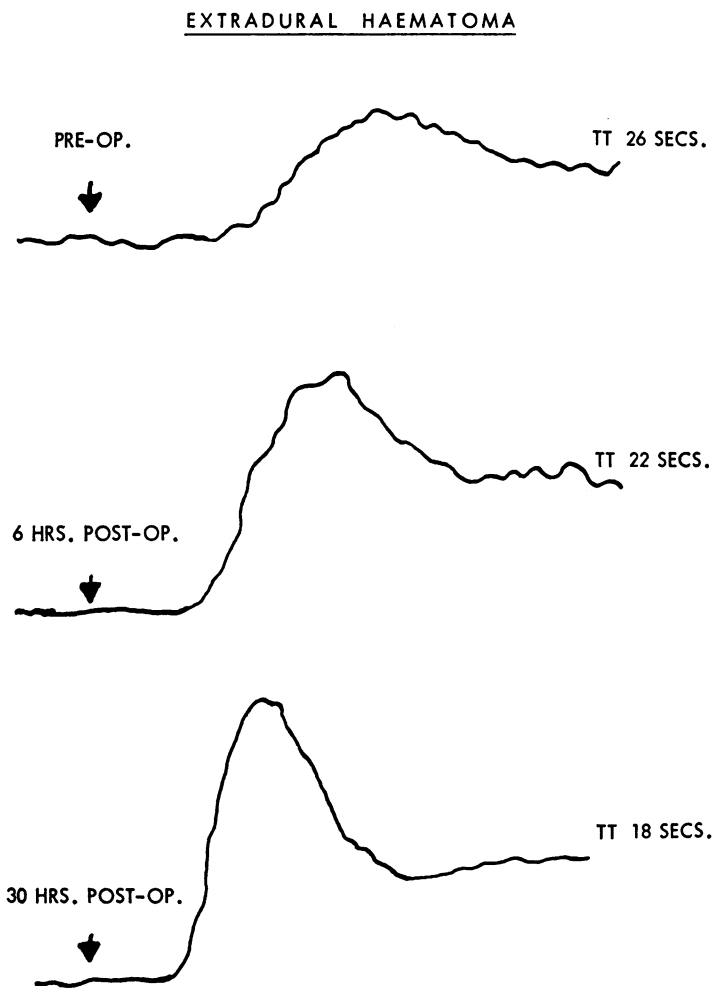


FIG. 3.
*Blood flow changes following removal of a large extradural haematoma showing its rapid improvement.*

The RCG becomes a useful guide to the patient's progress. If, for example, the flow curves obtained from each cerebral hemisphere do not improve after treatment, we conclude that either the ICP has not been sufficiently reduced, or that there is extensive underlying brain damage previously unrecognized.

As with the other tests described, signs associated with a grave prognosis have been found with RCG. Basically there are two types of curve which bode ill: the first is a flattening of the curve until it is difficult to see if any isotope enters the head (Fig. 4); presumably if the pressure is too high inside the head the blood flow will cease. The second characteristic curve which preceded death in six cases is more difficult to explain. After a flattening of the curve, the amplitude suddenly increased and the TT decreased to become identical in shape with the cardiac curve.

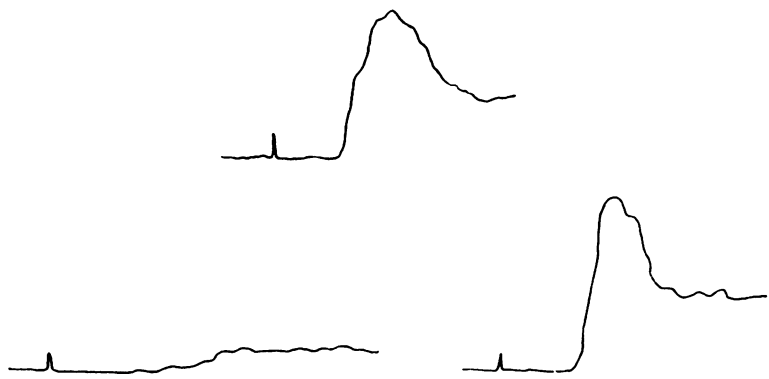

FIG. 4.
*RCG curves associated with bad prognosis (lower series) are compared with a normal curve (top).*

## EFFECT OF CARBON DIOXIDE ON HEAD INJURIES

Reference has already been made to the vicious circle of trauma-cerebral oedema-raised-intracranial-pressure. The cerebral oedema results from direct damage to the cerebral capillaries and subsequent swelling of the ischaemic cells. The normal nutrition of cells is interrupted and acid metabolites such as lactic acid will accumulate. This leads to the dilatation of small vessels in the damaged area. A major factor in the control of cerebral blood flow is the amount of carbon dioxide in the blood—an increase acts directly on normal cerebral vessels and they dilate. But what happens in a pocket of damaged brain tissue ? Blood vessels in this area are already maximally dilated and unresponsive as a result of trauma and the accumulation of acid metabolites. If the carbon dioxide in blood rises, only the normal vessels dilate; the intracranial volume and hence pressure will rise, causing further ischaemia in the damaged area. To make matters worse, the dilated vessels in normal brain shunt the blood from the ischaemic areas, a process termed the intracerebral steal phenomenon (Lassen, 1966; Symon, 1969).

That these changes occur in practice and not just in theory will be demonstrated by the following example (Fig. 5), which shows a decrease in cerebral blood flow due to increased $CO_2$ in the blood. In the normal brain, blood flow would speed up with an increasing $CO_2$ level, but in damaged brain there is a paradoxical response. As can be seen, the blood flow has deteriorated with the addition of $CO_2$ to the gas mixture breathed by the patient. From a theoretical point of view it can be seen that anything which increased blood levels in head injuries will produce further damage. The commonest way for this to occur is by lack of attention to the airway in injured patients, allowing the tongue to fall back into the pharynx with the patient lying on his back or by failure to establish an adequate airway.

## TREATMENT BY HYPERVENTILATION

If $CO_2$ accumulation is bad for the patient with brain injury, what would be the result of deliberately removing $CO_2$ by hyperventilation ? If the $CO_2$ level falls, vessels which can react will constrict and thus reduce the intracranial pressure. The shunt (or steal) reverses and the nutrition of the damaged area improves. This, then is the theoretical basis for a new method of treating the severe head injury—namely, hyperventilation by a mechanical respirator.

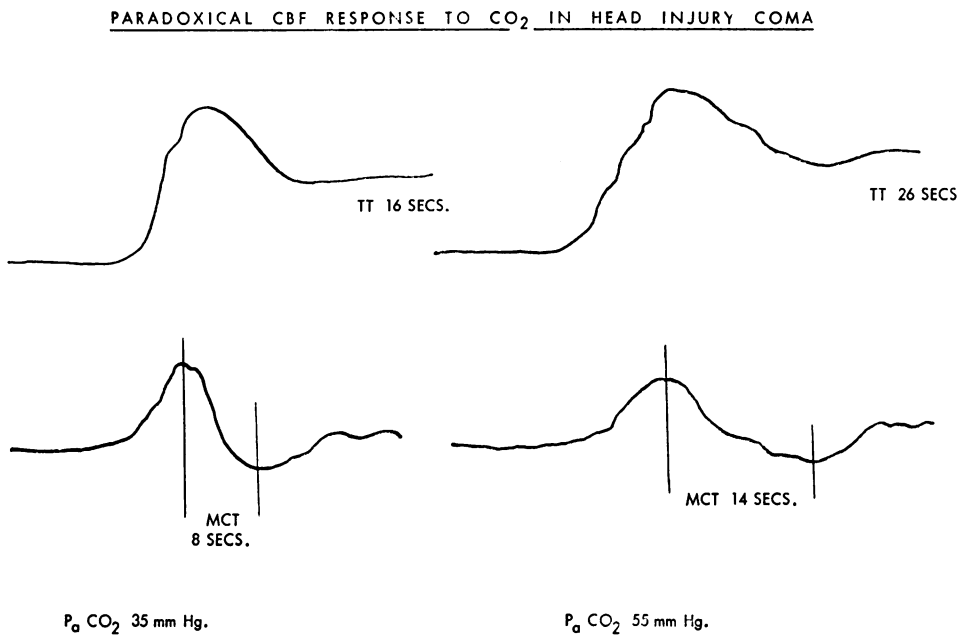


FIG. 5. *Deterioration in blood flow with increased blood $CO_2$ levels; this shows the importance of minor airway obstruction to the head-injured patient.*

Here is the effect of deliberately lowering the $CO_2$ levels by mechanical "over-breathing", i.e., intermittent positive pressure ventilation, (IPPV). The patient (RC), was involved in a brawl and sustained a head injury with generalised brain swelling (Fig. 6). The top curve was obtained before treatment began. The high level of $CO_2$, (57 mmHg) can be seen, (normal range 35-39 mmHg). The patient was paralyzed with a curare-like drug, intubated and mechanically ventilated to reduce the $CO_2$ levels. The effect on the cerebral circulation was dramatic and the improvement persisted after assisted ventilation had ceased. This illustrates the point made earlier, namely, the importance of breaking the vicious circle of oedema-raised intracranial pressure-increasing damage. A total of 26 patients have been hyperventilated, keeping the $pCO_2$ between 25-30 mmHg. After ventilation for an initial period of 48 hours, the curare drugs are reversed to allow clinical assessment. If the clinical condition is improved and the blood flow and intracranial pressure remain at satisfactory levels, hyperventilation is not resumed. Longer periods of hyperventilation — sometimes as long as two weeks — have been tried; the best results, however, are evident in a few days. The aim of treatment is to improve the quality of life in survivors, not merely the prolongation of vegative life. The prognostic tests already listed (intracranial pressure measurement, CSF lactate levels and cerebral blood flow), provide helpful guidance in carrying out this treatment.

In successful cases, the blood flow improved, shown by a decreased TT, and the intracranial pressure fell. In those who did not respond to treatment, the pressure

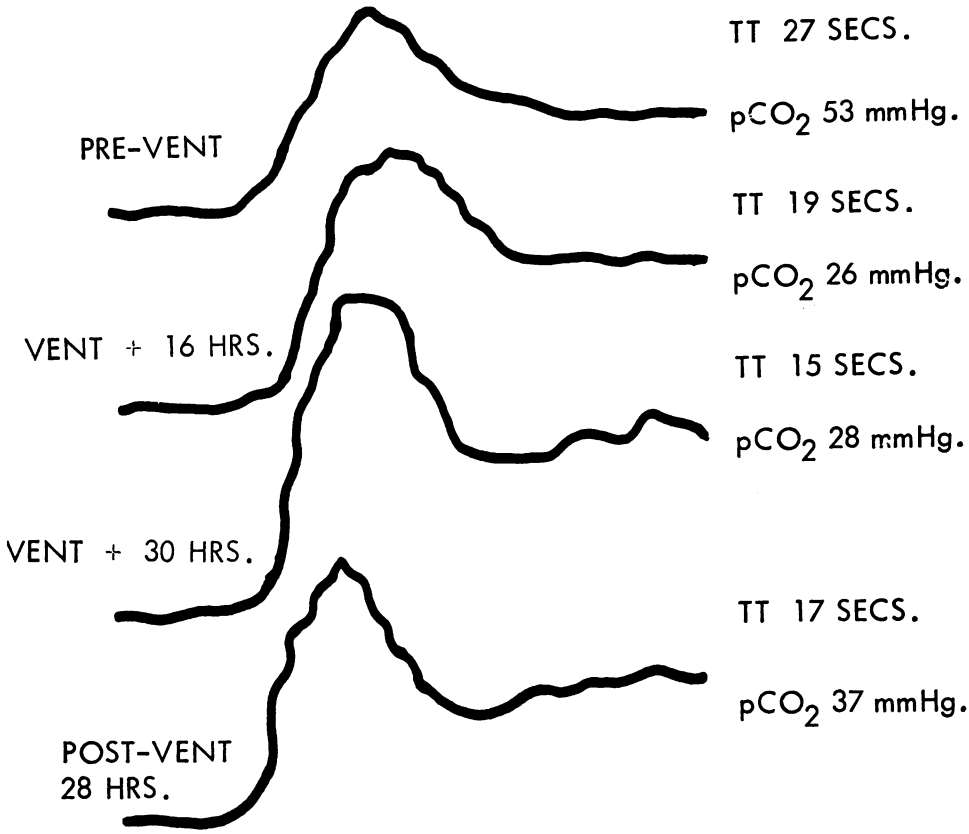


FIG. 6. *Improvement of blood flow with hyperventilation in a successful case. There was a corresponding fall in intracranial pressure.*

rose above 70mmHg and the RCG showed no shortening of TT. In fact, in some cases it was shown that the cerebral vasculature no longer reacted to blood $CO_2$ levels, presumably because of the extent of damage incurred at the time of injury and immediately following it. If there was no reaction by the vessels to alterations in $CO_2$ levels, then, on theoretical grounds, it was predictable that hyperventilation would not be successful.

Of course there are hazards with mechanical ventilation of patients with serious head injuries. As they are paralyzed with curare-like drugs it is difficult to detect the development of intracranial haematoma; before and during treatment all possible measures are taken to exclude such a lesion. If the ventilation is excessive (for instance, if the $pCO_2$ falls below 20 mmHg), normal brain cells are rendered ischaemic (Zwetnow, 1968). During treatment it is important to make frequent measurements of blood gases and CSF chemistry.

## Conclusion

This research investigation has not reached any new conclusions, rather it has re-stated the vital role of objective measurements in a lynamic condition such as head injury. It is by this method only that the treatment of serious head injuries can advance. Factors associated with a poor prognosis are given in Table 2 and, using these measurements with clinical judgment, it is possible that the quality of life of survivors can be improved and the prolongation of vegative life avoided.

Table II

*Results associated with a poor prognosis*

↑ Intracranial pressure (unresponsive to treatment)

↑ C.S.F. lactate 50 mg%

RCG – Long Transit Time (unresponsive to treatment)

– Very Short Transit Time (vasoparalysis)

Hyperventilation is a new approach to the problem of intracranial hypertension resulting from cerebral oedema and, while it is too early to be dogmatic, initial results have been encouraging.


## Acknowledgements

This research project was supported by a Royal Victoria Hospital Fellowship, for which I am most grateful. The task could not have been accomplished without the assistance of the following people, whom I would like to thank :

Mr. Derek S. Gordon—my sponsor and advisor of studies; Mr. Alex. R. Taylor and Mr. Colin A. Gleadhill—for their constructive criticism; the Nursing Staff of the various units; and Miss A. E. T. Turner—for secretarial help.


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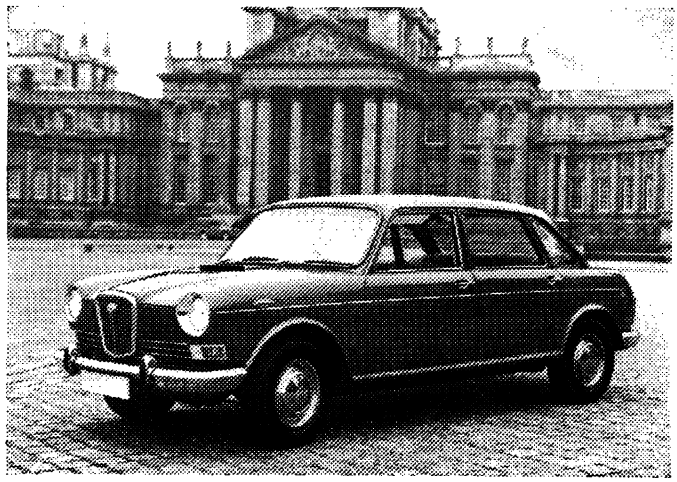

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# CLINICAL SCIENCE AT THE CROSSROADS

**A. M. CONNELL, M.D., B.Sc., F.R.C.P.,**
Mark Brown Professor of Medicine, University of Cincinnati, Ohio

An A. B. Mitchell Memorial Lecture delivered in the Institute of Clinical Science, Queen's University, Belfast

CLINICAL SCIENCE, as we know it, refers to the application of methods developed for the most part in the older and more precise sciences, to disease as it occurs in man. Sir Thomas Lewis was probably the person most instrumental in developing the methods of clinical science. With commendable simplicity of thought and procedure, he was concerned to apply the experimental method to the practice of medicine. In a leader article written 40 years ago Lewis (1931) remarked that the methods of pure observation had long passed their period of greatest activity, and extolling the experimental method, he went on to give what is probably still the best definition of clinical science: "Clinical science seeks by observation and otherwise to define diseases as they occur *in man.* It attempts to understand these diseases, and here make frequent use of the experimental method. It calls, or actually creates and uses physiological and pathological knowledge intimately related and applicable to the disease studied." Writing about the same time Professor Ryle, Professor of Physic at Oxford in the 1930's, had a very similar definition: "Clinical science observes, records and where possible measures the processes of disease as they occur *in the living subject* and within certain limitations it may control, modify or reproduce these responses for purposes of detailed study". (Ryle, 1930).

Clinicians have traditionally observed and recorded their data and before the heydey of experimental medicine older clinicians were particularly adept in the skills of diagnosis and prognosis. The emphasis, introduced by Lewis and Ryle, by Head, MacKenzie and others, was that of experimentation in the clinical situation. Experiment need not necessarily be complex or detailed. It may be very simple, as was frequently the case with Lewis himself. The natural sciences developed because the scientific method of which experiment is an integral part, was particularly useful in developing precise relationships and clinical science developed in the age of scientific optimism which followed the application of the experimental method to the natural sciences. This age of optimism survived the first world war and persisted till the second and clinical science developed in the belief that the application of the methods which had been useful in physics and chemistry and to an extent in physiology would result in dividends in clinical medicine.

There is no doubt that this change in emphasis has effected a revolution in clinical medicine. Hospitals which had previously been oriented and designed primarily for diagnosis and treatment developed large institutes dedicated to investigative research. Another result was the establishment of National Research Councils, such as the Medical Research Council or National Institutes of Health, which commanded and received, and still receive, large sums of public money. This was a very radical change. For over two thousand years physicians did not

feel that it was their duty to go much beyond the attempt to find a remedy for the complaint, but here was a revolution of thought that had profound effects in the practice of clinical medicine. And I think we are all now, in the 1970's only too well aware of our responsibility in this respect. Professor McCance has put it very succinctly that the medical profession has "a responsibility, not only for the cure of the sick and the prevention of disease, but for the advancement of knowledge upon which both depend". Professor Witts – lately Nuffield Professor at Oxford – "The individual doctor has a duty to contribute to the store of knowledge he has received from past generations so far as he has the opportunity". All specialists of medicine have benefited greatly in many ways as a result of this change and it is fair to say that medical research has brought medicine out of the age of folklore, superstition and philosophical speculation into the science which it is today. There is no doubt that without the insatiable curiosity of doctors at the present time, knowledge would tend to fall away, as it has done in past eras.

But it is just at this point that a discordant note enters our thinking, because the age of scientific optimism is over, and discontent, which undoubtedly exists, with the current practice of clinical science, in some measure reflects this. There is a ground swell of uneasiness about the rewards, whether they be academic, professional, social or economic, of clinical science, both inside and outside the profession. It is because of this change in attitude to clinical science that it may be at a crossroads.

The problem facing clinical investigators can be illustrated from a small but fairly typical area of study where I have had some personal experience – that of intestinal motility. Perhaps in intestinal motility we should have been warned. Bayliss and Starling made the comment (1899) that "In no subject of physiology is there so much confusion of fact and opinion as in the physiology of intestinal movements", and today, 73 years ahead, this still applies. Spurred on by the fact that disorders of the movements of the alimentary tract appear to form the basis for many abdominal symptoms and complaints, early and restricted observations of movements were made through fistulae and at surgery. A great impetus was provided by the development of the roentgen ray allowing observation of these movements in the intact man by radiology. The age of measurement really arrived only with the development of pressure studies and in the 1940's and the 1950's descriptive studies appeared in large numbers. It became possible to study analogues of intestinal movements and for the first time to bring precision into the measurement of intestinal movements. Soon through the application of relatively simple methods to the recording of intestinal pressures some clinical distinctions could be made. One of the more valuable ones was the differentiation between the sphincter of the lower oesophagus in the normal state and in achalasia. In the normal state the sphincter relaxes following swallowing before the peristaltic wave reaches it whereas in achalasia relaxation fails to occur and peristalisis is disorganised. This may be accompanied by typical radiological appearances. These recordings settled fairly rapidly a persisting dispute about whether dysphagia in this condition was due to an achalasia in the sense of failure of relaxation or a cardiospasm, with the cardia being held tonically in a state of tonic contraction. The continuing descriptions in the 1940's and 1950's helped considerably to extend the range of knowledge of pathophysiology and to an extent diagnosis and therapy of a variety of

oesphageal conditions ranging from hiatus hernia to visceral sclerosis of the oesophagus. Similar advances were made by the application of similar techniques to the colon.

Based on physiological studies of gastric emptying (Hunt and Knox, 1968) a simple clinical method of estimating gastric emptying was devised in this medical school (George, 1968a). This simple method requires only the passage of a naso-gastric tube and some simple analyses of samples withdrawn from the stomach, but its application has resulted in major rewards in our understanding of the pathophysiology of gastric ulcer (George, 1968b) and of the pathophysiology and therapy of post vagotomy diarrhoea (McKelvey, 1970).

In both these examples, considerable clinical advantage was achieved using a relatively small amount of effort and expenditure. However, such studies inevitably and necessarily lead to further and more fundamental questions such as: How do the pyloric and cardiac sphincters contract? What are the chemical, pharmacological or electrical accompaniments? Are there changes in electrical potential? What are the control mechanisms – are they nervous, humoral or a combination of both? To know about the muscle itself we have to move from pressure studies or relatively crude estimates of emptying towards recording some analogue of muscle activity itself, such as electrical potential. Such studies nearly always involve a more sophisticated technology such as the detection, amplification and recording of small muscle potentials, complex protein biochemistry, electron microscopy, to name some, and in this area these techniques involve a major investment of time and finance and the elaboration of them may require an investigator to spend virtually his whole time in experimentation. For a clinician to do this virtually means that he has to leave the bedside and take himself to the laboratory as a full-time laboratory worker.

There are two possible ways to approach this problem. In one, a clinician increasingly frustrated by the complexities to which his studies lead may become disillusioned with clinical research. This is best put I think by a previous A. B. Mitchell lecturer, Dr. Stanley Browne. He wrote this: "Many medical students and newly qualified practitioners pass through a phase compounded of idealism, altruism, perhaps a desire for approbation, during which they see themselves making great discoveries and pushing the frontiers of knowledge even further into the intriguing and beckoning unknown. They later discover, often to their mingled chagrin and surprise, that many of these frontiers are more distant than they realised, that the atmosphere there is more rare and attenuated than they imagined and that the discipline of adequate preparation for their exploratory adventures is more lengthy and more arduous than they are willing to endure. Far too frequently these early visions are lost, ideals become tarnished and the urge to investigate and discover is crowded out by the day to day pressures of practice. We lose the zest for new knowledge, the lure for the unknown and the capacity to praise objectively." These words sum up the attitude of a proportion of persons in the profession at the present time. Another undesirable approach is for the determined investigator to dedicate himself to mastering the complexities of the art or the science to which he has dedicated himself. He may be prepared to undertake the discipline which is necessary in order to do precise and good quality

scientific work, only to find that he is increasingly divorced from his original incentive and that his vision is restricted and distorted by the side chains that he has built around himself. The Chancellor of Queen's University, Sir Eric Ashby, wrote in 1961 of scientists "Crawling along the frontiers of knowledge with a hand lens" and this describes the constraints often imposed by scientists upon themselves. Witts, commenting on the same problem, makes the point that "much current clinical research, though accomplished in technique, is trivial in conception." Scientific myopia not only restricts vision but also leads to dogmatism and misunderstanding and many of the arguments which disfigure some of our scientific discussions could be avoided if scientists had a broader perspective.

The second constraint at the present time is related to the first. Because of the complexity of developments, costs are mounting very rapidly. The analysis of complex analogue signals such as those obtained in motility studies may require very sophisticated techniques, with involved and expensive mathematical model making. With costs of the order of millions of dollars it is proper to ask if this money is being well spent.

A great deal of the practical benefit of any advance in knowledge frequently results from the application of relatively simple methodology. The next, relatively smaller percentage benefit may be obtained relatively cheaply but the more detailed exploration of a problem often results in spiraling costs. If, added to this, the work is being done by enthusiastic amateurs as are many clinicians and is not being done very well, not only is it expensive but wastefully expensive. It is wasteful not only financially but professionally as well, because if we are unable to rely on the data presented in the journals the whole stock of clinical science begins to drop. Professor McCance has said "one irresponsible experimenter can do great harm to medical science. Every insubstantial statement about a drug or therapy that is published provides a threat to good medical practice and is a serious menace to progress."

Now at this point of time, many countries are facing increasing financial stringency, and this when on a world-wide scale, there are enormous medical problems particularly in the area of providing better primary medical care. I suspect that when the administrators of public funds look carefully at our journals at the present time they may decide that they are not always getting value for money expended in research.

The third constraint is more ethical but derives in some ways from previous considerations. I am not thinking of the immediate ethics of clinical research in the sense of what hazards or opportunities patients should be asked to submit to. This remains vitally important but by and large the guidelines such as the Helsinki declaration have been well defined and generally accepted. More specifically, I am reflecting on a growing movement influencing advanced communities at the present time. There is a ground swell of feeling, still ill defined and generalized, that technology, particularly in relation to the environment, and to health, is something actually or potentially dangerous. Clinical research shares in these suspicions, to an extent deservedly, because of occasional irresponsibilities or unforeseen accidents in clinical research programmes. Public unease is directed not only at medicine but at the whole area of environmental control. A number of advanced technological

projects are being drastically cut or voted down because they constitute a threat to the quality of life. In many ways this trend is welcomed but in the area of medical research it will inevitably lead to increased frustration. The increasingly stringent controls on the testing, manufacture and sale of drugs imposed by the Food and Drug Administration of the United States and similar bodies are in general welcomed by the public and reflect the public mood. There is the feeling that if a drug or a procedure or treatment is in any way dangerous or dirty it is better not to have it, even if it constitutes some technological advance. It seems that in the age of Aquarius the anvils of Vulcan are being muted. If these attitudes harden as seem possible we may find increasing difficulty in funding clinical research.

A related constraint derives from the philosophical uncertainties of our times. Our generation in the West at any rate, has become uncertain about the motivation and inspiration for the advancement of knowledge, particularly in relation to medicine. The evolution of Western medical practice via the medieval monastery, the almshouse, and especially via the great voluntary hospitals of the 18th and early 19th century, was motivated very largely by individualistic humanitarian principles and often specifically by Christian insistence for concern for the individual. Until recently, the practice of medicine in the West was derived consciously or unconsciously from these principles. However, utilitarianism, developed in the late 18th and early 19th century, somewhat loosely summarised as "the greatest good for the greatest number" has led to a shift in emphasis for medical research and practice. There is an increasing tendency for practice and research to be directed towards the group or the state as opposed to the individual. One recent writer in the Lancet said, "Healthy individuals are necessary for a healthy State." Another example of this emphasis is the almost universal use of the statistical approach and probability mathematics in modern medical research. Utilitarian principles are not necessarily incompatible with individualistic concerns but the integration of these views must necessarily be a sensitive one and at present considerable philosophical and conceptual uncertainty exists. Perhaps for this reason more than any other clinical research is at the crossroads.

Even in our current conceptual confusion physicians, who must always be essentially students of nature, can do a great deal to improve the standard and quality of their work. Using whatever instruments of precision are useful and available, all physicians ought and can continue to do careful observational research which is in no sense downgraded by the existence of the experimental method. Occasionally, the fathers of clinical science seemed to suggest that observational research was passé but I suspect that this was a deliberate over emphasis. In the event, the investigators of the pre-second war era from whose basis our current activities are developed were great users of the observational principle and there is a real need for revival of acute and detailed observation by doctors. Physicians with their training and experience are particularly well equipped to observe even if they are not always equipped to undertake the discipline of a basic science procedure, and changes in the medical curriculum to make the clinicians more of scientists so far have not been conspicuously successful. New syndromes and disease are occurring all the time, and new features of old disease present regularly. It is our duty to continue to explore, to record, to analyse these

changes. Physicians do this well and there is ample opportunity for latter day Sydenhams, Brights, Oslers or MacKenzies.

Others who may have submitted themselves to the long training and precise technical disciplines of precision chemistry, engineering or physics, can become masters of their art and must work in co-operation with the physician. They are trained to provide and interpret accurately the complex analogues on which contemporary descriptions rest and their co-operation with physicians should result in progress beyond the present point. To follow this out is in no sense to turn the clock back. Clinical medicine must continue to advance and Lewis's original intentions for clinical science are still valid and necessary Where we may part company with Lewis is that in Lewis's day it was still possible for one man to be master of a number of the disciplines of basic science, particularly physiology, pathology and remain an active and fully competent clinician. I suspect that this day is passing and now we are more obliged to work in co-operation and harness.

In the exploration of intestinal motility as in some other areas of study this is being achieved and with very valuable results. In 1967 a relatively small symposium, attended by clinicians, physiologists, pathologists, pharmacologists and one or two engineers met here in Belfast and in this sharing experience we all learned a great deal. Since this symposium was generally agreed to have been very valuable, further symposia have been developed and I believe that the clinicians who attended these meetings have learned a great deal about the basic principles of their own particular speciality. They have, by their contact with scientists in other disciplines, come to understand in a way which they did not previously the underlying principles which they were previously exploring rather superficially. In turn scientists working in physiology, pharmacology, engineering have once again had real questions to answer and have achieved a more decided and motivated approach to their work. The way ahead will be signposted by this sort of co-operation.

I close with a quotation, and it is this:

"I believe it no exaggeration to say that we are all at this moment alive to the existence of disturbing and retrograde tendencies in modern medicine. In the department of Diagnosis, early specialisation, the advent of numerous physical and chemical methods, which at first promised, and in some degree have proved, competent, to enhance the science and accuracy of clinical study, have brought disappointment in their train, have hampered the natural evolution of common observation and common sense and fostered faulty methods and an uncritical attitude in experiment. In the department of Therapeutics the same uncritical attitude and commercial enterprise between them have encouraged imprecision quite unworthy of our age. In the department of Prognosis there has not only been no general advance but an actual loss of competence through neglect of the study of the natural history of disease in man. Clinical practice will receive a strong stimulus to improvement when the methods of clinical science are better determined."

That was written in 1930 by Professor Ryle. He and Lewis and others had their own solution for their generation. It was a very valuable solution and has resulted in valuable progress from which we now benefit. I put it to you that the quotation is still apt in 1972 and we in our generation now have to develop the proper method for the latter part of this century.

# THE MALABSORPTION SYNDROMES
## Some Clinical Problems

**JOHN BADENOCH, D.M., F.R.C.P.**

Address to the Fellows & Members Club, Belfast,
Friday, 10th November, 1972

I HAVE BEEN interested in the malabsorption syndromes for a long time and one of the fascinations of a continued interest over the years is to watch the emphasis change as new knowledge is added and old problems are solved. When I reviewed the subject in 1960 the classical idea that all the signs and symptoms of the malabsorption syndromes were due to failure of absorption of essential substances still held the field, but even then this was difficult to sustain. It was held, for example, that the dermatitis, glossitis and cheilosis that occurred in some patients, were due to faulty absorption of B vitamins and yet it was known that with one or two notable exceptions the absorptive capacity of the small intestine for the water soluble vitamins was enormous, and that even in the presence of gross steatorrhoea enough could be absorbed to satisfy the body's needs. Gradually, we have had to come to realise that malabsorption is only one facet of the problem, even if it is the easiest to recognise.

In the presence of gross disorganisation of the small intestine not only are substances poorly absorbed but the normal losses by secretion and exudation into the lumen of the gut may be greatly increased either by direct seepage into the lumen or as a result of increased exfoliation of cells from the mucosal wall. Creamer and Croft (1970) have estimated that in normal man 60,000,000 cells may be lost daily from the small intestine together with 80 gms. of protein. Sixteen per cent of the protein lost is contained in the exfoliated cells. The greater quantity of this, of course, is digested and reabsorbed but in coeliac disease the loss of cells and protein may be increased six-fold and may contribute significantly to the hypoproteinaemia which occurs. It is known that not only protein but also iron and vitamin $B_{12}$ are lost both by exfoliation and exudation and it may well be that there is an increased loss of many other essential substances when the mucosa is damaged.

Moreover, the patient with malabsorption is at a double disadvantage because substances which are lost into the lumen of the gut are likely to be less well-absorbed than in normal persons. Finally, in coeliac disease and other conditions associated with malabsorption, failure of absorption and increased loss into the lumen of the bowel may not be the only factors of importance. It is quite possible that abnormal substances, the result of faulty digestion or bacterial action, may be absorbed and give rise to far-reaching effects. Perhaps the first pointer to this came from an observation by England, French and Rawson (1960) some years ago. They studied a patient with Whipple's disease and a light sensitive dermatitis who was found to be excreting abnormal porphyrins in the stools. Treatment with antibiotics abolished the porphyrins from the stools and cured the dermatitis. The exact reason for the improvement remained uncertain but it could have been due

to the destruction of bacteria that were the source of the abnormal porphyrins.

For the clinician, the observation of Dickie (1950) that the removal of wheat and rye protein from the diet of children with coeliac disease will cure the patient still holds the centre of the stage. Much fundamental research stems from this single fact but it is chastening to realise that in spite of all efforts the exact nature of the defect in the small intestine and the way in which this normal dietary protein exerts its damaging effect is still unknown.

In 1959 Fraser and his colleagues showed that a peptic/tryptic hydrolysate of gluten was toxic to patients with coeliac disease, but if this hydrolysate was further digested by fresh hog intestinal mucosa the product was no longer capable of damaging the intestinal mucosa and inducing malabsorption in coeliac patients. As a result of these experiments it was concluded that coeliac disease was due to the congenital absence of a peptidase from the intestinal mucosa (Fraser et al, 1959). Unhappily, sixteen years later this peptidase still eludes all efforts to find it. Perhaps the most damaging blow to the supporters of the "absent peptidase" theory of the aetiology of coeliac disease was struck by Douglas and Booth (1970). They showed that the activity of leucyl-leucine hydrolase was depressed in the mucosa of untreated coeliac patients but after treatment with a gluten-free diet or even after treatment with steroids while the patients continued to take gluten in the diet, no difference in activity between the coeliac patients and the normal controls could be found.

However, the absent peptidase theory cannot be disposed of as easily as that. Amino-acids are absorbed by more than one system and even the di- and tripeptides can be absorbed into the mucosal cell in several different ways, and, as Matthews (1971) has pointed out, the only single biochemical lesion which could impair the absorption of protein would be a failure of release of the amino acids produced by digestion from the mucosal cell into the bloodstream. It is known that amino acid transport defects, even when they involve several amino acids, do not produce any clinical signs directly referable to the impairment of protein absorption. The mucosal peptidases are so numerous and have so many overlapping specificities that a single defective peptidase might be very difficult to detect by present assay methods.

The second major hypothesis to explain gluten sensitivity invokes a disturbance of immune reactions and stems from two observations. The first was the observation that precipitating antibodies to gluten or to its derivatives can be found in the serum of some patients with coeliac disease (Berger, 1958), and, the second, was the demonstration that treatment with steroids could bring about improvement in these patients even if they continued to eat a diet that contained gluten (Katz et al, 1968). Personally, I believe that the second prop in the argument is not necessarily secure because there could be other reasons for the effects of steroids, for example they induce non-specific changes in the permeability of cells and they are known to alter the activity of lysozymes Nonetheless, in recent years our understanding of the immune defences of the gut has increased and this has lent impetus to a study of the disturbance that occurs in intestinal disease. We know, for example, that the plasma cells of the gut chiefly synthesize IgA which is released into the sub-epithelial pool as a 7s monomer. Some of this is transported across the gut epithelium becoming dimerised in the process and to this dimer

is added "secretory piece" which is formed in the epithelial cells. The 11s secretory IgA thus formed reached the lumen of the gut and it differs from 7s IgA in two important ways. The secretory IgA is resistant to normal intestinal pH and enzymes and it can fix complement and damage the lipoid membrane of bacteria (Hobbs, 1971).

The results of studies of the abnormalities of the immune globulins which are present in patients with coeliac disease have been conflicting and the picture has been complicated still further by the fact that patients with either primary deficiency of immune globulins or a deficiency secondary to other disease such as leukaemia, often have malabsorption. Both deficiency of IgA and IgM and an increase in IgA and IgM have been described. Many of the results are conflicting and it seems to depend largely on whether the author has been studying the serum, the mucosal wall of the intestine or the intestinal secretions within the lumen itself. Moreover the differences between coeliac disease and patients with other diseases of the gut are not absolutely clear cut. The changes seem to depend on whether or not the patient has been under treatment with a gluten-free diet. Recently, Hobbs and his colleagues, summarised what is known of the subject. In their view the only significant difference between patients with coeliac disease and those with other diseases involving the small intestine was that patients with coeliac disease, whatever the levels of IgA or IgM in their plasma, showed an increase in the density of jejunal plasma cells containing IgM while the density of plasma cells containing IgA was either normal or decreased (Hobbs et al, 1969).

It is known that antibodies of the IgA type provide the main defence of the gut against virus infection. Beale and his colleagues (1971) have shown that whereas coeliac patients can produce normal IgG antibodies in response to a challenge with tetanus toxoid, they produce subnormal amounts of IgA in response to an oral dose of poliomyelitis vaccine. Beale suggests that in coeliac disease the ability of the patient to produce IgA antibodies is depressed. In its place IgM antibodies are produced and these, unlike the IgA antibodies, are capable of damaging the intestinal mucosa (Beale et al, 1971).

The exact relationship of the relative deficiency in the synthesis of IgA to the aetiology of coeliac disease remains unclear. Certainly, enough evidence has already accumulated to show that a quantitative decrease in IgA does not occur in every patient. Perhaps in the future it will be more profitable to look at the quality of the IgA which is produced and to follow up the work which has been done on patients with giardiasis and nodular lymphoid hyperplasia of the gut. In some of these, although the levels of IgA and IgM have been normal, the IgM has been found to be of poor quality and inadequate to protect the wall of the gut from the parasite (Hobbs, 1971).

Personally, I think it may be some time before we understand fully the cause of the gluten sensitive enteropathy. The one unassailable fact is that one chemical compound or a small group of chemical compounds have been shown to do the damage while as far as we know, once the mucous membrane has been restored to normal, all other substances present in the food are harmless. This being so, it seems odd to me that a failure of the normal IgA immune response, which one

would expect to involve a whole series of potentially damaging substances, should be so restrictive in its action.

In the last five years we have learnt a great deal about the processes of digestion that go on within the mucosal cell of the small intestine and it may yet be shown that the two hypotheses, on the one hand the alleged absence of a peptidase, on the other the abnormalities in the immune response, may yet be closely interrelated and that the prime cause of the immunological abnormality is a disturbance of the chemistry within the cells of the mucous membrane itself.

Whatever its cause it is a fact that immuneparesis does occur in some patients with the coeliac syndrome and as Austad and his colleagues have emphasised there is a profound disturbance of the lymphoreticular system (Austad et al, 1967). There may be splenic atrophy with Howell Jolly bodies in the red blood cells and an increased red cell survival time. There is hypoplasia of the peripheral lymph nodes and an increase in size of the nodes in the mesentery, and the lamina propria of the gut, and even the epithelial cells may be infiltrated with lymphocytes. Austad and his colleagues have postulated that the immunological insufficiency may be the result of a prolonged overactivity of antibody formation aggravated in some way by the sensitivity to gluten. Whatever its cause there is no doubt that immuneparesis does occur and it is perhaps of more than theoretical interest that it also occurs in Hodgkin's disease and other lymphomata. It is now well recognised that lymphomata occur more often in patients with the coeliac syndrome than in the population at large, and Whitehead (1968) has suggested that in these patients there may be a progressive hyperplasia of the lymphoreticular system with a gradual appearance of abnormal reticulum cells ending in the clinical manifestation of reticulosarcoma. He believes that this may be an expression of an auto-immune process that goes on to malignancy, and that it can be compared with the reticuloses that complicate some cases of Hashimoto's disease of the thyroid.

The incidence of carcinoma, especially of the foregut, is also higher in patients with coeliac disease than in the general population and I suppose it is possible that here, too, the development of an immuneparesis may predispose to the neoplastic change.

There is another aspect of the clinical picture of coeliac disease which may be linked to the immuneparesis. Everybody who has studied patients with steatorrhoea has encountered a few with a lesion of the spinal cord which can progress despite full supportive therapy including vitamin $B_{12}$, a gluten-free diet and steroids. I have had five totally unexplained cases and Cooke and Smith in 1966 published an account of sixteen. Their patients, eleven male and five female, were aged 26 to 68 at the onset of the neropathy. The main changes were a sensory ataxia chiefly involving the legs, a peripheral neuropathy, posterior column loss, muscle weakness but little wasting and no tenderness. Three of the patients had cerebellar dysfunction and five had unexplained transient attacks of loss of consciousness. In ten the neuropathy had been steadily progressive, nine had died and in four the neuropathy was the main cause of death. In another four it was a major contributory factor. It is of interest that one died of a reticulosarcoma. At autopsy in these patients the pathological changes are widespread and diffuse involving the cortex, the anterior horn cells and the spinal cord. There is patchy atrophy and loss of cells and focal areas of demyelination. The changes most closely resemble

those seen in the multi-focal leucoencephalopathy that occurs in association with neoplastic disorders.

As I have mentioned, one patient in Cooke's series died of a reticulosarcoma and there are at least two other cases in the literature in which this has happened. One, reported by Brain, Croft and Wilkinson in 1965, had steatorrhoea and a reticulosarcoma with neurological signs resembling motor neurone disease and another, published by Missen in 1966, with steatorrhoea and a malignant lympoma of the intestine suffered from cerebellar cortical dysfunction towards the end of his life. This is a surprising association and for some time I have been wondering whether these facets of the clinical picture of the coeliac syndrome, the immune-paresis, the increased incidence of malignant change and the progressive and lethal neuropathy might be related. Nobody knows the cause of the immuneparesis but once established might it not allow a slow virus to attack the central nervous system or perhaps even allow the development of a neoplasm which as Missen, himself, has suggested might further impair the immune defence by massive replacement of the lymphoreticular system by malignant cells and thus lay the way open for a neurotropic virus. Clearly, the neuropathy of the coeliac syndrome should be a fruitful field for study. It is certainly not due to a deficiency of any known vitamin. It can be progressive and lethal in spite of all attempts at treatment and it is associated with a neoplasm more commonly than seems possible by chance alone. It remains a complete enigma.

The next aspect of the malabsorption syndromes that I wish to consider today is the derangement of function that accompanies the short gut syndrome. The pattern of ileal dysfunction which follows resection of the bowel is particularly interesting because it has led to a better understanding of much of the pathophysiology of malabsorption but here also there are some unsolved problems. Börgstrom and his co-workers showed that after a test meal not only sugar and protein but also fat are almost completely absorbed in the first metre of the jejunum (Börgstrom et al, 1957). This being so it is perhaps surprising that the loss of part of the small intestine should be associated with such a profound disturbance of function. However, the situation is not always too desperate. It is known that 70 per cent of the small intestine can be resected without steatorrhoea if the terminal ileum and ileocaecal valve are preserved. If these are resected the position is very much worse and a loss of just over 50 per cent will lead to persistent diarrhoea and steatorrhoea.

The simple sugars and many water soluble substances are absorbed in the high small bowel and proteins, fats and fat soluble vitamins are absorbed in the upper and mid-small bowel, but cholesterol, vitamin $B_{12}$ and the bile salts are chiefly absorbed by an active transport system selectively localised to the ileum. When the lower small bowel is resected the sites of active transport of these substances are lost and it is the failure of the absorption of bile salts and consequent bile salt deficiency that explains why steatorrhoea is much more prone to occur after ileal resections than after resections of the jejunum.

Under normal condition 98 per cent of the bile salts that are secreted into the lumen of the intestine are reabsorbed and find their way back to the liver via the portal stream for recirculation in the bile. The bile salts are recirculated several

times a day and under normal conditions the amount of new bile acid synthesised from cholesterol just equals the loss of bile acids in the faeces. Anything that interrupts the enterohepatic circulation of bile salts will lead to a rapid depletion of the pool with consequent failure of the micellar phase of fat absorption. The four main causes of depletion of the pool of circulating bile acids are obstructive jaundice, the contaminated bowel syndrome in which bacteria bring about excessive deconjugation of the bile salts, the binding of bile salts within the lumen of the gut by ion-exchange resins such as cholestyramine, and resection of the ileum or the short gut syndrome. Following a resection of the ileum loss of the active absorptive site for bile salts causes them to reach the colon in larger quantities than normal where they block the active absorption of water and electrolytes from the bowel and make the diarrhoea worse (Mekhjian et al, 1968).

If the resection of the bowel is complicated by the presence of strictures, blind loops of gut or fistulae, bacteria will flourish and abnormal deconjugation of even those bile salts that remain will occur. This will deplete the pool of bile salts still further and make it even more difficult to form the micelles necessary for fat absorption. The damaging effect of depletion of the bile salt pool is not limited to the absorption of fat. There is some evidence that when free bile acids are present in excess within the lumen of the gut they interfere also with the active transport of sugars and amino acids although the exact way in which they do this remains unknown (Baraona et al, 1968).

In the absence of gross bacterial contamination jejunectomy does not produce a continuing clinical defect in the transport of proteins, sugars or electrolytes because the active transport sites for these substances are present throughout the small intestine. Similarly, the removal of the ileum does not produce a major primary defect in absorption unless changes in motility, or abnormal bile salt loss with consequent steatorrhoea supervene.

Usually there is plenty of reserve capacity for active absorption but sometimes it is possible to saturate a limited active transport system. For example, after massive resection of the gut a solute overload at meal times can lead to tiresome postprandial diarrhoea which takes months to subside.

It would be very useful if passive transport played a greater part in normal absorption but unhappily its place is limited. Sugars, electrolytes, amino acids, fatty acids, pyrimidines, bile salts, cholesterol, vitamin $B_{12}$ and folic acid all require an active transport system. A notable and useful exception involves the medium chain triglycerides which are absorbed largely by passive diffusion. Many substances that are primarily absorbed by an active process can also be absorbed in small amounts by passive diffusion and, if the body's requirements are small, enough may be absorbed by this route. This probably applies to some vitamins, trace elements and drugs.

The main cause of failure of absorption in the short gut syndrome is the loss of specialised absorptive sites especially those localised to the ileum, but there are also some secondary effects of resection of the gut which contribute to the disturbance in function. The worst of these is the alteration in gastric secretion and the disturbance of gastric and intestinal motility that develops. In man and

in experimental animals after resection of the small intestine gastric hypersecretion occurs.

The aetiology of the gastric hypersecretion is still in doubt. It is more marked after proximal than distal resections. It is possible, I suppose, that the small bowel remnant elaborates a gastric secretagogue. It has been shown that patients who have had a portacaval shunt secrete abnormal amounts of acid and that this is caused possibly by a secretagogue elaborated in the jejunum, but after resection of the bowel the excessive secretion of acid from the stomach seems more likely to be due to the loss of an inhibitor of gastric secretion, an enterogastrone. It is interesting that both serotonin and histaminase are localised in the upper small intestine and if the secretion of either of these were reduced gastric hypersecretion might result.

In 1956 Reynell and Spray in Oxford showed that after massive resection of the small gut in rats there was a marked increase in motility and a shortened transit time. This effect, in contrast to the gastric hypersecretion, is more marked if the distal small bowel is removed. Its cause is unknown but here, too, the loss of an inhibitory hormone could be responsible.

In coeliac disease in particular abnormalities of function resulting from the loss of gastrointestinal hormones are probably much more common than we realise. It is self-evident if you stop to think about it. In the gluten enteropathy the villi are destroyed, the mucosa is flattened, the brush border has vanished and the epithelial cells are debased and distorted. When this occurs we are quite ready to accept that there will be a failure of the intramural phase of digestion. On the other hand the concept that there must also be a loss of production of any intestinal hormones which are ebalorated in the mucosal cells or in the brush border is relatively new and is still not widely accepted.

In the past year or so evidence has been accumulating that loss of these gastro-intestinal hormones may indeed be important. In normal persons the physiological stimulus for the secretion of pancreozymin is the presence of amino-acids in the lumen of the upper intestine. In 1969 DiMagno, Go and Summerskill showed that in patients with coeliac disease the perfusion of the jejunum with amino-acids produced a subnormal secretion of pancreatic enzymes. They deduced that this was because the amino-acids present within the lumen had led to the release of abnormally small amounts of pancreozymin from the intestine. If the pancreozymin was injected parenterally the outflow of enzymes from the pancreas was normal. Similarly, Low-Beer and his colleagues (1971) from Bristol have demonstrated inertia of the gall bladder in response to a fatty meal in patients with coeliac disease. They have suggested that the failure of the gall bladder to contract resulted from an impairment of the release of cholycystokinin, and they postulate that the steatorrhoea in coeliac disease may be aggravated by a delay in the secretion of bile salts and pancreatic enzymes after a meal, which contributes to the failure of micelle formation. In this context it is interesting to recall that patients with the short gut syndrome and ileal dysfunction have a much higher incidence of gall stones than the population at large, and it may be that bile is sequestered in the biliary tree because of gall bladder inertia resulting from the loss of an intestinal activator.

It has been recognised for some time that patients with intestinal disease and especially those who have had a resection of the small bowel are more prone than the general population to the development of stones not only in the gall bladder but also in the kidneys. In the United States the incidence of renal stones in patients in hospital is estimated to be about 1 : 1,000 but Gelzayd and his colleagues in 1968 reviewed 885 patients with bowel disease and found the incidence of nephrolithiasis in them to be 7.2 per cent.

Initially, it was thought that the increased incidence of renal stones was caused by the fact that many of these patients lose quantities of water, sodium and bicarbonate into the gut and as a result secrete an acid urine of low volume which would favour stone formation, but in 1970 Hofmann and co-workers described two patients with previous small bowel resection and nephrolithiasis who had hyperoxaluria. In 1971, Dowling, Rose and Suter reported eleven patients with ileal dysfunction, eight of whom had hyperoxaluria and three of whom had calcium oxalate stones in the renal tract.

Several hypotheses have been put forward to explain the hyperoxaluria and in 1972 at the meeting of the British Society for Gastroenterology at Aviemore Chadwick, Modha and Dowling produced an interesting paper that did much to settle the dispute. It has been suggested that bile salt glycine spilling into the colon because of ileal dysfunction was deconjugated by bacteria, converted to glyoxalate, absorbed and then oxidised to oxalate with the production of hyperoxaluria. Dowling and his colleagues fed cholyl glycine labelled with radio-active carbon to control subjects and patients after ileectomy. The amount of radio-active carbon dioxide recovered from the breath of those with ileectomy was much increased when compared with the control subjects, but in both groups the amount of the dose of labelled cholyl glycine excreted in the urine as oxalate was the same. This would appear to exclude the excess bile salt glycine as the precursors of the excessive amounts of urinary oxalate.

It has also been suggested that after ileal resection the increased drain on hepatic glycine for bile salt conjugation might be met by an increased conversion of glycollate through glyoxalate to glycine. However, Dowling and his colleagues showed that after the intravenous injection of glyoxalate labelled with radio-active carbon the conversion to bile salt glycine, carbon dioxide and urinary oxalate was the same in the controls as in the patients with ileal resection and hyperoxaluria. They also fed oxalate labelled with radio-active carbon to normal controls and to patients with an ileectomy with and without hyperoxaluria. In the controls 28 per cent of the radio-active oxalate was recovered from the urine in the first 36 hours, 29 per cent was recovered from the patients with ileectomy without hyperoxaluria and 52 per cent over the same period from those with an ileectomy with hyperoxaluria. This suggested strongly that the hyperoxaluria following ileectomy was the result of an increased absorption of oxalate from the bowel. Finally, Dowling and his co-workers confirmed this hypothesis by the demonstration that if the oxalate was removed from the diet of those patients with hyperoxaluria excessive urinary excretion of oxalate ceased.

Why some patients with an ileal resection should absorb excessive amounts of oxalate from the diet and others should not remains in doubt and there is still

the interesting but unexplained observation by Smith, Fromm and Hofmann (1972) that cholestyramine will decrease the excretion of oxalate in patients with the short gut syndrome, and as yet it is far from clear why an ion-exchange resin should block the absorption of oxalate from the bowel.

Before we leave the short gut syndrome we must not forget the possibility that patients with ileal resection seem to be more prone to the malabsorption of essential substances than even those with the coeliac syndrome. In the past we have concentrated too much on the recognised vitamins and have attributed any unexplained symptoms to their lack. However, Press and his colleagues (1972) have shown that in patients with ileal resection the percentage of essential fatty acids in the lecithin, triglyceride and cholesterol ester in fasting plasma is lower than in normal persons. It has been shown that a deficiency of essential fatty acids can cause diarrhoea and dermatitis in human infants and in one of Press' patients with low levels of linoleic acid in the blood fats and a severe dermatitis the intravenous administration of "intralipid" cured the skin lesions. There is also the interesting observation that deficiency of essential fatty acids leads to the development of gall stones in hamsters and perhaps the increased incidence of gall stones in patients with ileal resection is due not only to gall bladder inertia but also to a shortage of essential fatty acids.

Several attempts have been made to lessen the diarrhoea in patients with the short gut syndrome. Considerable adaptation occurs with time and the diarrhoea and steatorrhoea tend to decrease as the remnant of bowel hypertrophies. In those in whom the diarrhoea persists probably the most useful regime is the substitution of medium chain triglycerides for the long chain fats in the normal diet (Zurier et al, 1966). These medium chain triglycerides can be absorbed without prior emulsification and solublisation by bile salts and they form a useful source of calories and decrease the steatorrhoea. An interesting feature of the treatment is that the steatorrhoea and diarrhoea does not decrease for a week or ten days after the treatment has begun. At the moment there is no clear explanation why this should be so, but it could be due to a gradual reduction in the amount of irritating long chain fatty acids being delivered to the colon. It is important to know that improvement takes time because the slow response may lead to the treatment being abandoned prematurely because it appears to be unhelpful.

Sometimes treatment with oral bile acids will reduce the diarrhoea, but in my experience more commonly the cathartic effect of the bile salts potentiates the diarrhoea without reducing the steatorrhoea appreciably. Oxbile in a dose of 3–6 gms. daily seems the best preparation to use but I have not had much success with it myself.

Calcium carbonate has also been used in the treatment of patients with ileal resection (LeVeen et al, 1967). The rationale of its use is that the calcium carbonate forms non-irritating soaps with free fatty acids, but to be effective the dose may have to be very large, up to 30 gms. a day, and there is a danger of the development of the milk-alkali syndrome. As an alternative cholestyramine can be used. It acts by binding bile salts within the lumen of the intestine and it may reduce the diarrhoea but at the cost of aggravating the deficiency of bile salts still further and making the absorption of fat even more difficult.

Of these measures, the substitution of medium chain triglycerides for the long chain fats in the diet offers the most physiological approach to a difficult problem and if they are introduced slowly the fat intake can usually be built up to a level that provides enough calories for adequate nutrition.

The medium chain triglycerides are useful in other forms of malabsorption also. They are helpful in children with fibrocystic disease and in those with biliary atresia. They have a place in the treatment of patients with a contaminated bowel syndrome when this is not amenable to surgery, they have revolutionised the management of a number of rare forms of malabsorption including a $\beta$-lipoproteinaemia in which the sufferer is unable to form chylomicrons and they can reduce the gross steatorrhoea of patients with intestinal lymphangiectasia. They have also proved helpful in children with steatorrhoea resulting from disaccharidase deficiency (Gracey et al, 1970).

The final topic I wish to consider is the relationship of drugs to malabsorption. Today the clinician is becoming increasingly aware of the toxic effects of drugs and the gastro-intestinal tract has not escaped unscathed. The classical example is the malabsorption produced by Neomycin. This drug produces a malabsorption of fat, protein, glucose, d-zylose, cholesterol, carotine, sodium, calcium, vitamin $B_{12}$ and iron. The effect can be produced by as little as 3 g. a day. Neomycin induces morphological changes in the mucosa, precipitates bile salts, inhibits intra-luminal hydrolysis of long chain triglycerides presumably by inhibiting pancreatic lipase. It also reduces intestinal lactase activity and lowers serum cholesterol possibly by blocking cholesterol synthesis within intestinal crypts or by interfering with its absorption. Neither steroids nor a gluten-free diet improves the malabsorption induced by Neomycin. Neomycin is not the only drug which can bring about malabsorption. Other antibiotics, notably tetracycline, Kanamycin, Polymyxin and Bacitracin, produce minimal malabsorption in man. Alcohol can inhibit folate absorption, anti-convulsants may reduce the absorption of vitamin $B_{12}$, folate and also d-zylose. Cathartics in excess can produce steatorrhoea as well as diarrhoea and malabsorption has resulted from the use of colchicine, PAS, Phenindione, mannitol and calcium carbonate, while MER 29 (Triparanol) once used in the treatment of hypercholesterolaemia produced a severe steatorrhoea and a mucosal lesion indistinguishable from that seen in the coeliac syndrome.

In the gluten enteropathy and other conditions which cause widespread damage to the small intestine drugs, like other substances, may be involved in the general malabsorption. The best documented is digitalis which needs to be given in large doses if a therapeutic level is to be attained (Heizer et al, 1971) but no doubt others are similarly affected. Finally, there are other even more complex ways in which drugs may interfere with the normal processes of absorption. For example, calcium is necessary for the absorption of vitamin $B_{12}$ and vitamin $B_{12}$ deficiency itself may contribute to its own malabsorption (Chanarin, 1971). Enzymes induction may lead to malabsorption more often than has been realised. Recently, it has been shown that anti-convulsant drugs induce hepatic enzymes which lead to the inactivation of vitamin D with the consequent failure of absorption of calcium and osteomalacia (Richens and Rowe, 1970). The possible interactions are legion and in the future, just as we have to consider a failure of secretion of intestinal hormones when we are faced with an unexplained clinical situation in a patient

with malabsorption, so I think will we have to consider that the clue to the problem or the source of the trouble may lie on the treatment chart at the foot of the bed.

The small bowel is a difficult organ to study even today. The gluten enteropathy, Crohn's disease and other states of malabsorption are nature's experiments in the physiology and pathology of intestinal function. They still have much to teach us and if, like the Prince of Serandib, we can see when we are not looking then each time we treat one of these patients we may be able to add a little to our knowledge of this fascinating field.

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# THE FUTURE ROLE OF THE NURSE IN GENERAL PRACTICE*

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WE ARE all aware of the impending re-organisation of health and personal social services in Northern Ireland, aimed at producing functional integration of hospital and community services. This is a response to the changing medico-social needs of society. One is also aware of the profound structural changes taking place in primary medical care, based on health centre development. The concept of the primary care team of doctors, nurses and social workers is now accepted and firmly established in some areas, although few social workers are as yet attached to general practice. We have much greater experince of nurse and health visitor attachments. Maybin (1972) states that by 1975 well over 50 per cent of doctors in the province will be practising from health centres, and in the forseeable future this will have risen to at least 70 per cent.

An active interest has been shown recently in the future role of the nurse in general practice and in her relationships with the doctor and other team members. An attempt is made in this paper to define this role and to point out a few relevant problems. Obviously her work will vary in detail from practice to practice and in different areas. There are many variables in general practice, including the size and type of practice, the degree of organisation and specialisation of function and the diversity of professional attitudes. The role of the health nurse or health visitor is easier to define than that of the clinical nurse and will I think be largely unchanged in the future. This paper is mainly concerned with the problems of the latter, who is to be called the community clinical sister in the future. Before defining her role, I wish to comment on the present marked difference of views on:

1. What duties she should perform.
2. By whom she should be employed.
3. To whom she should be responsible.

Reedy (1972a) has fully discussed this diversity of views. It has arisen because of the conflict of interests between the nurse who is attached to a practice by the local authority and the nurse who is employed directly by the general practitioner and paid by him. The latter usually works in small sized primary care units with widely varying terms and conditions of service. Pioneering surveys have been carried out in England which have demonstrated clearly that with suitable training, the practice nurse could assume enhanced clinical responsibilities and develop continuing relationships with the practice patients, which could be a source of valuable information about patient behaviour to the doctor concerned. About the

*A paper read at a Symposium on the Role of the Nurse in General Practice, at the Belfast City Hospital, on 12th November, 1972, organised by the Education Committee of the Northern Ireland Faculty of the Royal College of General Practitioners.

same time, the B.M.A. Charter in 1966 introduced financial incentives to encourage general practitioners to improve their technical and human resources, and they began to group together and enter purpose built premises in increasing numbers. Since then the concept of the primary care team has become firmly established.

Many family doctors, however, accustomed as they have been to small practice units and economy of expenditure, find it difficult to adapt to larger units and to accept specialisation of function within the team. They have always worked with multi-purpose staff and shared out work equally regardless of status or skills. As organisation gets bigger there comes a point at which specialisation of function and a hierarchy of control are necessary for the smooth running of the organisation. This point has now been reached in modern group practice.

Reedy (1972b) comments that the nursing institutions have rightly shown concern about the future of the community clinical sister, who will work under the clinical supervision of the primary care physician. They are worried about her terms and conditions of service, her professional isolation, about study leave and other factors. In a detailed study of 140 practices, Drury and Kuennsberg (1970) found that 85 per cent of practice nurses were used regularly for reception duties and 90 per cent for making appointments. This suggests a waste of professional skills. Against this they reported that 40 per cent of secretary-receptionists tested urines, and 15 per cent did minor surgical dressings. It is evident that there are dangers inherent in this multi-purpose use of staff in small primary care units. With the emphasis on economy of effort and finance the administrative duties are allocated regardless of professional standing.

Terms and conditions of service are probably most advantageous for the nurse, when she is attached after consultation by an enlightened medical officer of health to a group of general practitioners who understand the basic principles of good personnel management. It is essential that the family doctors are consulted and participate in the interview and selection of nursing candidates. Reedy (1972b) believes that the time-work-load saving attributable to such an attachment of a nurse should not be over emphasised. In 1968 the Royal College of General Practitioners reported falling trends in consultation rates between doctor and patient, as the number of items of service carried out by the nurse increased (Royal College of General Practitioners, 1968). It is commonly found that the length of the doctor's day is not reduced in proportion to the nurse or health visitor's contribution, but the quality of practice is greatly improved. This applies particularly to the work of the health visitor.

I believe that the most important aspect of the future role of the nurse will be her capacity to develop continuing and meaningful relationships with patients and feed back valuable information to the doctor. She will, I believe, be used increasingly as the point of first contact in the surgery and home. This implies a role with a higher degree of clinical autonomy than at present. Professor Asa Briggs (D.H.S.S., 1972) has suggested a basic 18 months training period which would lead to the Certificate in Nursing Practice, including experience of hospital and community medicine. A further 18 months course will lead to registration and during it, or following it, nurses may sit for the Higher Certificate of Nursing which will qualify them as specialists in one of the 4 main clinical areas, medical, surgical, psychiatric or community nursing.

Table I illustrates the many technical duties which can be performed by a treatment room nurse in general practice. Tables II and III show the role of the clinical nurse in assessment and treatment. Table IV outlines her general duties. The new post-basic training of the nurse (D.H.S.S., 1972) should enable her to perform these tasks competently.

TABLE I

*Technical duties performed by the treatment room nurse in general practice*

CLINICAL MEASUREMENTS

BP, temperature, pulse, respiration rate, height and weight.

CLINICAL TESTS

Estimation of E.S.R., Hb
Urinalysis
Chemical test of faeces

COLLECTION OF LABORATORY SPECIMENS

Haematological and biochemical – Venepuncture
Bacteriological – urine, sputum, swabs, etc.
Viral – blood, faeces, throat swabs
Fungal – scrapings
Cytological – cervical cytology

MISCELLANEOUS

Electrocardiography
Vitalograph or peak flow meter
Tonometry
Audiometry (usually performed by health visitor)
Immunisations

TABLE II

*The role of the clinical nurse in general practice*

A. Screening of casual attenders or emergencies in the treatment room.
B. Assessment of patients in the home on initial and follow-up visits.
C. Follow-up of patients in the surgery (or group clinic) for treatment or surveillance.

TABLE III

*The role of the clinical nurse in general practice*

*Assessment of signs and symptoms*

INITIAL HOME VISITS

Minor upper respiratory and alimentary tract infections
Specific infectious diseases
Discharges from hospital
Vague calls for advice
Chronic sick (include geriatric patients)

FOLLOW-UP VISITS

Follow-up of above
Control in cardio-respiratory conditions
Selected mental problems
Rheumatic disorders (lumbago)

CLINICAL SURVEILLANCE OF

Patients requiring dietary supervision (e.g. obesity)
Selected cases of hypertension, or controlled cardiac arrythmias
Mental illness, e.g., depression, schizophrenia, on long term therapy

TREATMENT

Advice to doctor and/or patient

GENERAL

Sub-cutaneous and intra-muscular therapy, dressings, ear-syringing, incision of abscesses, removal of cysts, suture removal, suturing, etc., gynaecological procedures, e.g. cervical smears, changing pessaries

TABLE IV

*General duties*

Chaperoning patients
Preparing patients for examination
Assisting reception staff with casual attenders
Communicating with hospital and laboratory
Assessing treatment room needs: equipment, dressings, drugs, coats, towels, etc.
Assisting the doctors at examinations and operations
Covering the clinic in the absence of medical staff

In a larger unit some of the technical tasks might be delegated, but it is likely that the future clinical nurse in general practice will continue to do these to strengthen her bonds with patients. General practitioners in turn must learn to delegate case material which the new nurse's training will qualify her to handle. To assign and give authority to the nurse, demands co-ordination of activities and some degree of supervision. Clearly understood criteria governing the work of the nurse must be laid down. She must NOT become a "feldsher" (i.e. an independent inadequately trained doctor).

In 1966 the Terms of Service for General Practitioners in the N.H.S. were revised and formal sanction was given to the general practitioner to delegate work to his professional and lay staff, provided the person was competent to carry out such treatment. Thus in 1971, the Department of Health and Social Security sanctioned the delegation to a nurse of vaccination, but the doctor had to satisfy himself that the nurse had received training in the procedure and was conversant with the requirements for the storage and handling of the vaccine (Reedy 1972 c). The difficulty in the future will be to know how precisely to define the area of clinical activity of the nurse. I repeat again, the aim should be to give the nurse limited clinical autonomy under supervision, and delegation simply implies that the more highly trained doctor accepts that some of his diagnostic and treatment functions can be assigned to and performed competently by his nursing colleague.

Like the general practitioner himself the clinical nurse should work both in the treatment room and in the patient's home. She should have free access to a patient's records, and should herself keep adequate records. Ideally she should have access like the doctor to secretarial help for form filling and letters. The recently published Harvard Davis Report (D.H.S.S., 1971) states "there is a considerable amount of work undertaken at present by the general practitioner which could be delegated to suitably trained nurses and similarly some work could be delegated by highly trained nurses to less highly trained nurses", and so on. Which reminds me of the old adage, "large fleas have small fleas and so add infinitum." Nurses are already being used in a decision making capacity, e.g. in industrial medicine and in the hospital service. The possibility of combining the role of clinical and health nurses was considered, but rejected. It was feared that the demands of curative medicine would take precedence over and detract from the quality and scope of the preventive work. In the future, therefore, it is accepted that the health visitor or community health sister will continue to provide a health education service to families and individuals in the community. The five main aspects of her work are as follows:

1. The prevention of ill health.
2. Early detection and surveillance of high risk groups.
3. Recognition of need and mobilisation of resources.
4. Health teaching.
5. Provision of care; support during stress; advice in illness; and management of children.

One of the great advances in integrating community care services in the past decade has been the reconciliation of health visitors and general practitioners

brought about by attachment to individual practices by enlightened medical officers of health. This has enabled each to understand more fully the role of the other and the professional skills involved. The present generation of medical undergraduates are being given for the first time a much deeper insight into community care and the necessity for a team approach to meet comprehensive medico-social needs. They are being taught to be aggressive, not passive, towards health education and preventive medicine. They are taught the relevance of clinical epidemiology, the use of age-sex registers to identify vulnerable age and sex groups, and have to learn more about human development at all ages. The shift is towards pre-symptomatic detection of illness, and to achieve the clinical aim of early detection of abnormalities, through screening or periodic check-ups, the primary care physician needs the help of his health visitor. She can organise development clinics for infants and young children, immunisation sessions, and help the family doctor to practice preventive geriatric care. She will continue to provide advice and help to mothers before and after their confinements and to their children in infancy and childhood. Owing to the shortage of social workers, I believe the health visitor for many years to come will help the general practitioner to cope with the many common and practice social problems, which arise from day to day. Like the general practitioner she has not the time available to get deeply involved in the long term management of emotional disorders which require counselling and case work techniques of analysis.

We are on the threshold of an administrative reorganisation of the whole National Health Scheme aimed at functional integration of all services under one authority. This will have to be flexible at all levels. There is no room for confusion of views about the future nurse's role and her relationships with other team members nor about her manner of employment or source of authority.

No distinction should be maintained between the practice nurse directly employed by the general practitioner and Area Board nurses attached to a group practice. Harvard Davis's committee (D.H.S.S., 1971) states "we recognise that a separate nurse has suited some practices and nurses but it should not be continued within a unified health service". If Professor Asa Brigg's recommendations (D.H.S.S., 1972) are accepted, it is comforting to realise that nurses in future will be given experience of community nursing as part of both basic and post basic training.

It appears that the nursing service of a group practice will be best supplied in the future by the team of health visitor, clinical nurse, and enrolled nurse supported by ancilliary nursing help as required. Apart from her nursing duties the distinction between being a technical assistant or a professional colleague in the future lies in the degree to which the general practitioner is prepared to delegate and give the clinical nurse limited clinical autonomy, which must be limited to clearly defined areas, apart from which she works under supervision. The danger of the clinical nurse merging into an inadequately trained primary physician – a feldsher – must be constantly borne in mind.

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# RENAL TRANSPLANTATION BETWEEN MONOZYGOTIC TWINS DISCORDANT FOR UNILATERAL RENAL AGENESIS

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TO DATE 30 renal transplant operations have been carried out in Belfast. Cadaver donors accounted for 28 of these. One patient received a kidney from his father. We present here the first successful case of renal transplantation between monozygotic twins to have been carried out in Ireland. The recipient developed renal failure as a result of a congenital abnormality not present in the donor.

## Case Report

The patient was a 26 year old man who presented with typical symptoms of end-stage renal failure in December, 1971. Prior to this he had always been well, though his mother remembered that he had a "chill on the kidneys" at the age of 6 years. The family history was negative for renal disease. He had a twin brother.

On examination he was clinically anaemic and uraemic. Blood pressure was 130/80 mm Hg. Blood urea 310 mg%; $CO_2CP$ 10 mEq/l, electrolytes otherwise normal; G.F.R. 3.9 ml/minute; Hb 8.3 g%; serum calcium 7.3 mg%; serum phosphorus 9.4 mg%; alkaline phosphatase 7 K.A. units; barium meal and micturating cystogram showed no abnormality; Australia antigen negative; height 5 ft. 8 in.; H L-A type 2, 8, W27. Blood group 0 Rh. Positive.

He was treated with a Giordano-Giovanetti diet but without drugs or sodium restriction. An arterio-venous fistula was created surgically to facilitate haemodialysis when required. With dietary restriction the blood urea fell to 48 mg%. G.F.R. remained less than 5 ml/minute.

His twin was admitted for investigation as to monozygosity, and as a potential kidney donor. Facial similarity was striking, but he was 4 inches taller than his brother. H L-A type 2, 8, W27, blood group 0 Rh. Positive, and identical with his twin to 10 sub-groups. Blood urea 25 mg%; electrolytes normal; G.F.R. 115 ml. per minute. Intravenous pyelogram showed 2 normally functioning kidneys; renal arteriogram also showed 2 normal kidneys with vasculature suitable for transplantation; M.S.S.U. was sterile and contained no protein or abnormal elements.

Pre-transplant nephrectomy was carried out on the uraemic twin on 25th May, 1972. The right kidney was found to be absent, and the left small and scarred.

The father of the twins was of blood group B Rh. Positive, and their mother 0 Rh. Positive. The parents differed in four other sub-groups. The probability, calculated by the method of Smith and Penrose (1955), that the twins were identical was $p=0.9910$.

Following nephrectomy the patient was maintained on twice weekly haemodialysis until 22nd June, 1972, when the donor's right kidney was transplanted into the recipient's left iliac fossa. No immunosuppressive therapy was given. Renal function was adequate to sustain the patient from the immediate post-operative period without further dialysis. When last seen on 20th October, 1972, his G.F.R. was 87 ml per minute;; blood urea 51 mg%; haemoglobin 14.9%; calcium 10.6 mg%; phosphorus 3.8 mg%; M.S.S.U. was sterile and free from protein.

The donor made an uncomplicated recovery.

## Discussion

Congenital unilateral absence of a kidney is a fairly frequent finding, occurring in 1 in 600 to 1 in 1000 autopsies (Longo and Thompson, 1952; Thompson and Lynn, 1966). The condition is more common in males than in females, and usually presents clinically between 35 and 45 years. The fact that our patient presented in terminal renal failure at 26 years and was 4 inches shorter than his brother indicates possible renal insufficiency of long standing, and suggests that the contralateral kidney may have been the site of congenital disease or abnormality as is known to occur in 25 per cent of cases.

The frequency of congenital malformation is about twice as high in monozygotic twins as in single births, while there is no increase in dizygotic twins (Stevenson et al, 1966). Few examples of congenital renal abnormalies in twins have been reported. Waardenburg (1952) observed monozygotic twins concordant for unilateral renal agenesis; one with a right and the other with a left solitary kidney. An extensive review of the literature by Warkany (1971) did not reveal any further examples of congenital renal agenesis in twins. Our patients would therefore appear to be the first reported example of monozygotic twins discordant for unilateral renal agenesis.

The ethical problems involved in the transplantation of kidneys from living donors have been clearly spelt out by McGeown (1968). Most workers in the field would now agree with her that live donors should only be used in very exceptional cases, or for transplants between identical twins. The results of identical twin transplants are so superior to others that the risks are usually considered justified. However, when the transplant is between identical twins special difficulties arise which must be taken into account. Firstly, there is the risk of recurrence of the disease causing the original renal failure in the transplanted kidney. Secondly, there is always the possibility that the healthy donor will subsequently develop the disease which caused renal failure in his twin brother. In these respects our patients were singularly fortunate in that uraemia developed on the basis of a congenital abnormality which obviously could not recur in the recipient and clearly would not now develop in the donor.

## ACKNOWLEDGEMENTS

We are grateful to Dr. T. E. Field of the Northern Ireland Blood Transfusion Service for carrying out the extended blood group investigations, and Miss N. Conway who typed the manuscript.

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# HYPOKALAEMIC PARALYSIS DUE TO CARBENOXOLONE

by

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## Introduction

Hypokalaemia is known to occur in patients receiving long-term carbenoxolone therapy. (Brown et al., 1972). Though the loss of potassium with normal dosage rarely produces symptoms, several case reports of patients with muscle paresis and myopathy have appeared. (Mohamed et al., 1966; Forshaw, 1969; Swallow, 1969; Mitchell, 1971). We report a case of unusual severity.

## Case Report

A 48 year old man was admitted with a four-day history of muscle cramps and paralysis. Two months previously the patient had been treated in another hospital for haematemesis arising from a lesser-curve gastric ulcer. At that time the serum potassium was 3.44 m.Eq/1. He received 6 units of whole blood. Five days later carbenoxolone sodium 150 mg daily was commenced. No other drugs were prescribed. He took carbenoxolone for 28 days, and 7 days after discontinuing the drug he was reviewed at the first hospital. He reported no symptoms but had gained 10.1 Kg in five weeks. Later that day he developed cramps in his thighs and experienced difficulty in walking owing to weakness in his back and legs. The weakness got worse over the four days preceding admission to this hospital, until he could not lift his head from the pillow.

On examination there was complete paralysis of the extensors of the left wrist, severe weakness of the left biceps, triceps and deltoid muscles and marked winging of the left scapula. The right arm and both legs were less severely affected but there was almost complete paralysis of the sternomastoid and trapezius muscles. Ocular movements, speech and swallowing were normal. The tendon reflexes were absent in the left arm but present in the other limbs. The plantar responses were flexor. There was no muscle wasting but stretching of both quadriceps groups caused pain. Sensation was normal. The blood pressure was 160/100 mm.Hg: there was no oedema.

Investigations on admission were as follows: The serum electrolytes (m.Eq/1) were: sodium 149, potassium 2.19, chloride 91, $CO_2$ > 40, Astrup: pH 7.55, $PCO_2$ 53, base excess > +20, plasma bicarbonate 46. The Hb was 11.4 gm%, white cells 7,000/c.mm., and the serum proteins 6.85 gm%. Serum calcium was 8.5 mg% and phosphorus 2.05 mg%. The serum creatine phosphokinase was 1,100 units/ml (normal 0-50 units/ml). The urine was alkaline and slightly smoky in appearance. There was a trace of albuminuria and microscopical examination

showed some red cells and a few organisms. No porphyrins were detected. Spectroscopic examination for myoglobin was not performed. The cardiogram showed marked hypokalaemic changes with ST segment depression, massive U waves and frequent ventricular ectopic beats.

He received 250 m.Eq of potassium by intravenous infusion over 36 hours, by which time the serum potassium had risen to 2.63 m.Eq/l and the patient felt much stronger. Oral potassium, 160 m.Eq/day in tablet form was commenced. On the sixth day of treatment, when recovery of muscle power was almost complete, serum potassium was 3.5 m.Eq/l, $CO_2$, 39 m.Eq/l and serum creatine phosphokinase 670 units/ml. His potassium intake and blood levels are illustrated in the Figure.

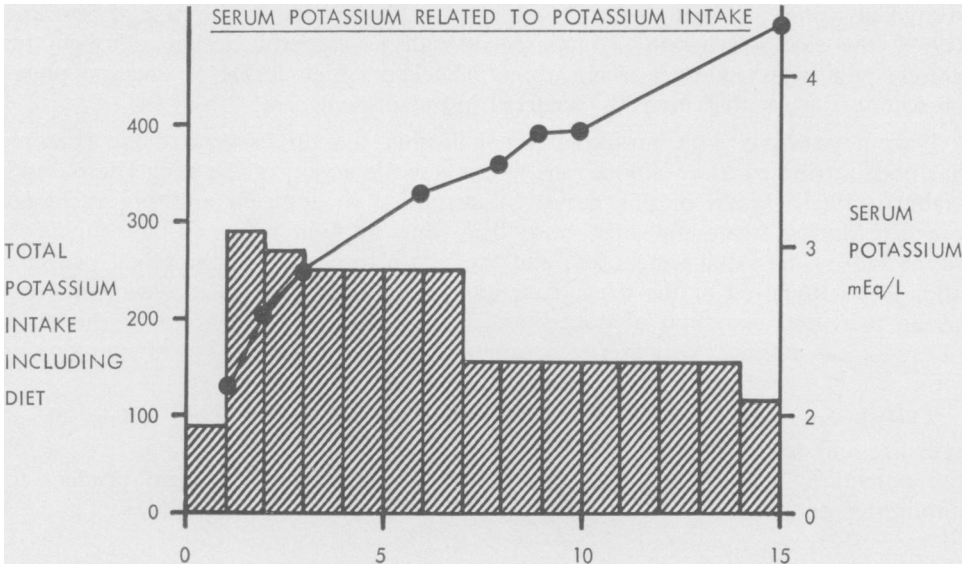


*Figure relating intake of potassium to correction of serum potassium.*

At review two weeks later no paresis remained. The blood pressure was 140/80 mm.Hg and the patient had lost 5.4 Kg since discontinuing carbenoxolone. The serum electrolytes (m.Eq/l) were: sodium 144, potassium 4.65, chloride 103 and $CO_2$ 32.1. The cardiogram was normal. Potassium supplements were discontinued. Three months later the electrolytes were normal, serum creatine phosphokinase was 8 units/ml and the serum aldolase 1.4 units/ml. The serum calcium was 10.0 mg%, phosphorus 3.8 mg% and serum proteins 6.3 gm%.

## Comment

The onset of paralysis after only 4 weeks treatment with Carbenoxolone is most unusual. Mitchell (1971) reported the onset of paralysis after five weeks treatment in a patient on a higher dosage (200 mg. daily). The severity of potassium depletion

in our patient was remarkable. Based on replacement requirements more than one third of total body exchangeable potassium had been lost i.e. 30-40 m.Eq/day for four weeks (Figure). This is comparable to the severity of potassium loss in the case of Mohamed et al. (1966). We cannot explain the long interval between cessation of treatment and the onset of weakness. Though Duogastrone may remain in the stomach for several days, Biogastrone is absorbed rapidly. Delayed paralysis was not precipitated by the administration of a thiazide diuretic as in the case of Fyfe et al. (1969). Swallow (1969) described a patient with weakness of the neck muscles but we have not discovered another case with complete "head-drop".

Muscle pain is often a more prominent feature than in the present case and may be the dominant symptom (Morgan et al. 1966). Mohamed et al. (1966) demonstrated myositis in patients with muscle pain and weakness. In the case of Swallow (1969), the electromyogram was consistent with a myopathic lesion although the muscle pain and tenderness were absent. The very high levels of creatine phosphokinase suggest that myositis occurred in the present case.

Flaccid paralysis with profound hypokalaemia due to carbenoxolone therapy has been attributed to an aldosterone-like metabolic action of the drug (Baron and Nabarro 1967). Much of this patient's substantial weight gain and rise in blood pressure during treatment must have been due to fluid retention, a conclusion supported by the rapid weight loss and the return to normal of the blood pressure after discontinuation of the drug. Retention of sodium and water is accompanied by an increased excretion of potassium. The alkalosis is thought to be due to a physiological attempt to conserve potassium ions by the excretion of ammonium ions.

The present case emphasises the need for careful monitoring of the weight, blood pressure and serum potassium of all patients receiving Carbenoxolone. In view of the potentially lethal effects of severe hypokalaemia it would seem prudent to administer potassium 40 m.Eq daily to such patients.

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# CAREER PREFERENCES OF PRE-REGISTRATION DOCTORS IN N. IRELAND (1972)

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## BACKGROUND

IN the early months of 1972 Council launched its Careers Information and Advice Service for junior medical staff by inviting the holders of the 117 pre-registration posts in the province to complete and return a postal questionnaire summarising their career intentions and outlining the disciplines for which career advice was requested. This was directed at doctors who had graduated in July and December 1971, mainly from Queen's University, Belfast, and this group will be referred to as Group A.

In October 1972 a similar exercise was undertaken again offering the use of the Careers Information and Advice Service to holders of pre-registration posts who had graduated mainly from Queen's University in July 1972; this group will be referred to as Group B.

Sixty-four doctors from Group A completed and returned their forms and at the time of writing seventy doctors have done so from Group B.

The Careers Information and Advice forms are used as a basis for career counselling by Council's Specialty Advisers and it must be emphasised that at no time, was the form represented as a direct survey of career preferences; given the novelty of centralised career guidance in the province, the response to date is seen as most encouraging.

## FINDINGS

Although respondents could elaborate on their intentions they were, in the first instance, restricted to nine major specialties which corresponded with Council's Specialty Committees and Advisers. They were then asked to indicate their intentions as 'certain', 'probable' or 'uncertain'. Any specialty indicated under the first two headings was taken as a first preference but where 'probable' was indicated other specialties were also listed as under consideration.

Figure I illustrates Northern Ireland findings based on first preference career choice; Table I compares these findings with those of a similar survey carried out recently on pre-registration doctors in the Manchester/Sheffield region and an earlier survey conducted by the Royal Commission on Medical Education (1966) in which final year medical students were asked to indicate their career preferences.

It can be observed from these figures that 1/5 of the doctors concerned in the Northern Ireland survey were uncertain about their career intentions and Figure I shows this to be consistent for both groups in spite of the fact that members of Group A were well through their pre-registration year while those in Group B were just beginning. Furthermore information from career interviews has shown that most of the doctors who indicated their 'probable' intentions in a particular specialty turned out to be poorly informed on alternative career prospects. Such

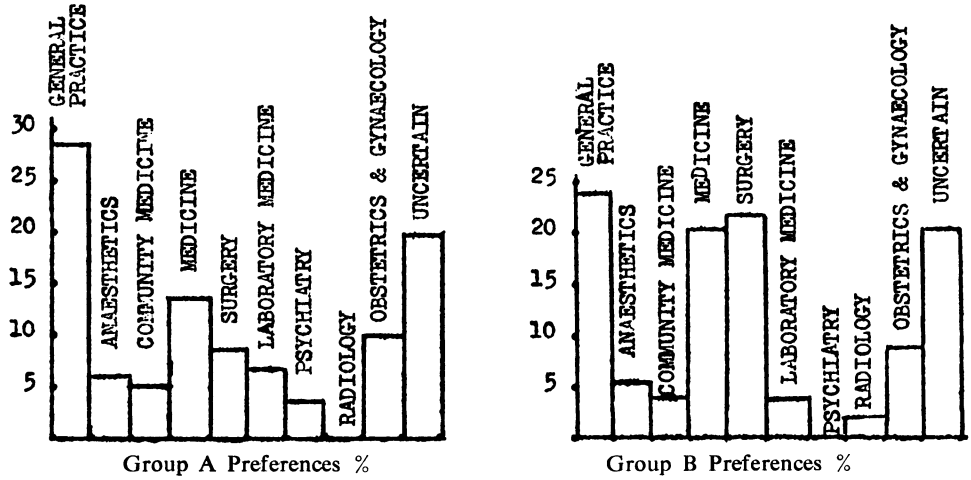


FIG. 1. *Summary of First Choice Career Preferences*

TABLE I: *Comparison of Overall Preferences* (%)

| | *N. Ireland Survey* (1972) (2 *Groups*) | *Manchester/Sheffield Survey* (1971) | *Royal Commission Survey* (1966) |
|---|---|---|---|
| Medicine | 16.2 | 24.0 | 26.5 |
| Surgery | 14.6 | 19.9 | 17.8 |
| Obstetrics and Gynaecology | 7.8 | 5.5 | 12.4 |
| General Practice | 26.4 | 32.2 | 23.5 |
| Psychiatry | .8 | 1.4 | 5.2 |
| Community Medicine | 2.8 | 2.0 | 1.6 |
| Laboratory Medicine | 4.0 | 3.4 | 2.1 |
| Anaesthetics | 5.6 | 8.2 | 2.0 |
| Radiology | 1.2 | .7 | 6.8 |
| Others/Uncertain | 20.6 | 2.7 | 8.1 |

findings help to strengthen the case for career guidance for medical students, particularly in their final two years.

The report on the Manchester/Sheffield survey contrasted the popularity of general practice (32.2 per cent) with the figure of 23.5 per cent for the same specialty revealed by the survey for the Royal Commission on Medical Education (1966). Whilst the figure of 26.4 per cent for Northern Ireland would appear closer to the latter, a broader interpretation of the findings has shown that an overall 42 per cent were prepared at least to consider general practice as a career while only 20 per cent were prepared similarly to consider medicine, the next most popular

specialty. Almost all of those who had indicated surgery as their intended career were 'Certain' and only a few listed it merely as a specialty under consideration.

While it may be considered that opting for general practice is in a sense taking the easy way out, the Careers Information and Advice Service stresses the importance of vocational training in general practice as in any other specialty.

Psychiatry is in rather a better position than the figures would indicate since an overall 7 per cent were prepared to consider it as a future career. Only in radiology and community medicine is the situation rather less than hopeful. Only one doctor out of both groups combined expressed an intention to specialise in radiology but although the specialty probably suffers at the pre-registration stage from a lack of exposure the possibility of early consultant status may tend to make it more attractive at a later stage. Radiology, like anaesthetics, plays a vital role in hospital practice, but only a comparatively small part in undergraduate education.

Community medicine suffered an unexplained slump in the returns from Group B and indeed the lack of male interest from either group must give rise to some concern. However the developing training programme of the new Faculty of Community Medicine may help to stimulate interest.

It is worth comparing the Northern Ireland figures for career preference with the ideal distribution of career posts for a cohort of one hundred doctors (Table II) (Source: Dept. of Health & Social Security) and with the distribution of medical career posts in the United Kingdom (1970) (Figure II).

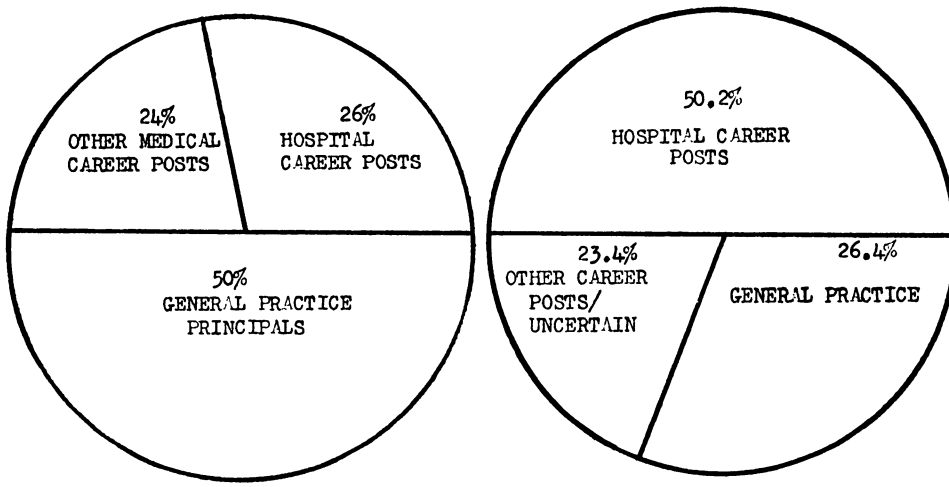


FIG. 2. *Distribution of medical career posts in United Kingdom* (1970) (*left*) *compared with distribution on first choice career preferences of pre-registration doctors in Northern Ireland in* 1972 (*right*). *The data for the United Kingdom is from "Teach-in", January* 1972.

The situation in medicine, surgery and obstetrics and gynaecology reflects the national picture but although the bias to these specialties is hardly surprising during the pre-registration year since their powerful and attractive academic departments are the basis of medical education and the main channels of instruction in the final undergraduate clinical years, it is more than a passing phase. The senior registrar

TABLE II

| *N. Ireland Survey* | | *Career Posts* |
|---|---|---|
| 26.4 | General Practice | 47.4 |
| 1.2 | Radiology | 1.8 |
| 2.8 | Community Medicine | 12.5 |
| 16.2 | Medicine | 6.5 |
| 14.6 | Surgery | 6.4 |
| 0.8 | Psychiatry | 3.5 |
| 5.6 | Anaesthetics | 3.1 |
| 4.0 | Laboratory Medicine | 2.7 |
| 7.8 | Obstetrics and Gynaecology | 1.4 |
| 20.6 | Others/Uncertain | 14.7 |
| 100.0 | | 100.00 |

establishment is firmly tied to consultant vacancies and it was stated in the British Medical Journal in 1971 that for every senior surgical post going there are five middle registrars applying. Nevertheless within both medicine and surgery there are branches in which staffing problems are acute. The current situation in Northern Ireland is given in Table III.

TABLE III

*Relationship between Doctors in Training and Prospective Consultant Vacancies in Northern Ireland*

| *SURGERY* | *Supply of Trainees* | *MEDICINE* | *Supply of Trainees* |
|---|---|---|---|
| General | S | General | I/B |
| Thoracic | I/B | Cardiology | S |
| Paediatric | I/B | Therapeutics & Pharmacology | I/B |
| Neurosurgery | S | Dermatology | I/B |
| Plastic | S | Venereology | D |
| Cardiac | I/B | Neurology | I/B |
| Urology | D | Gerantology | D |
| Orthopaedic | S | Paediatrics | I/B |
| E.N.T. | L.D. | | |
| Opthalmic | L.D. | | |

S=Surplus I/B=In-Balance D=Deficit L.D.=Large Deficit

Most of the doctors replying to the questionnaires were aged 25 or under, 49 per cent were married and 22 per cent were women. The large proportion of married

doctors emphasises the need for the provision of adequate married accommodation especially outside Belfast. During interviews many doctors indicated that they had or were in the process of buying houses in the Belfast area, something which tends to restrict their future mobility, to the detriment of peripheral hospitals. Women doctors tended overwhelmingly to see their future careers in either community medicine or paediatrics and rarely in general practice. No doubt this is at least partly due to the recognition that part-time posts or regular hours in these specialties are more likely to be obtained.

The questionnaire also included an optional question which asked if the doctor intended to pursue his career in Northern Ireland, some other part of the United Kingdom or elsewhere. The returns from Group A showed that 26 per cent intended to leave Northern Ireland while the response from the larger Group B was a similar 26 per cent. While too much reliance should not be placed on these figures it would appear possible that the emigration rate of doctors has not been affected appreciably by the great increase in civil unrest during 1972.

## Conclusions

In one of the earliest approaches to this problem Last and Stanley (1968) stated that the choice which the doctor in training must make between the range of careers in medical practice is only slightly less important than his initial decision to study medicine. However, the actual period during which a final decision is reached will vary enormously between individuals and indeed Last and Stanley found that as long as five years after qualification less than two thirds of doctors in their survey had definitely decided on their ultimate careers. They also concluded as Table II shows in simplified form that the ambitions of young doctors were grossly discrepant from the potential openings in the senior ranks of the National Health Service especially in medicine, surgery and obstetrics and gynaecology. Faced with this eventual impasse many indicated that rather than modify their plans for a career in the specialty of their choice they would emigrate.

Thus the returns for Northern Ireland are encouraging in their realism since a large percentage are at least prepared to consider general practice as a future career. This is in contrast to the findings of Last and Stanley who concluded that few young doctors were prepared to consider general practice as a second choice if their first choice was either a mainstream or minor clinical specialty.

Undoubtedly a considerable need exists for more study of the difference between ambition and achievement in career choice. If Council's Career Information and Advice Service succeeds in persuading young doctors to assess realistically their career prospects in the light of the opportunities which exist it will have achieved its purpose.

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*Published by arrangement with and under the auspices of the N.I. Council for Postgraduate Medical Education.*

# THE FUTURE SHAPE AND ORGANISATION OF GENERAL PRACTICE IN MEDICINE AND DENTISTRY IN NORTHERN IRELAND

Report on a Management Course for general medical and dental practitioners

THE Northern Ireland Council for Post-Graduate Medical Education sponsored a management course on this subject for general medical and general dental practitioners in the Ballygally Castle Hotel from 29th October to 3rd November, 1972. The course was arranged through the Northern Ireland Staffs Council for Health & Welfare Services and directed by two senior consultants of the Industrial Training Service (Team Management Unit), Messrs. W. C. Hurst and W. M. Scott. This article contains a summary of the members' conclusions about the subject matter.

## A. The Health Centre Concept

*The future of general practice in medicine in Northern Ireland lies in the development of the concept of the health centre. This is probably true also in a major way of the future of general practice in dentistry.*

The major arguments for this view are as follows:

### *The Needs of the Patient*

It is now generally accepted that the medical needs of patients are inter-related with other needs and that a team approach, which integrates the contribution of different disciplines and enables new knowledge to be applied in such areas as preventative medicine and the pre-symptomatic detection of illness, must be the keynote for the future. The team approach, in the context of 'total patient care', can best be organised and deployed from within the framework of a health centre.

### *The Need to Change the Emphasis from Care in the Hospital to Care within the Community*

Sir Keith Joseph, Secretary of State for Social Services in Great Britain, wrote in his foreword to the National Health Services reorganisation White Paper that 'the domiciliary and community services are underdeveloped'. This is a reflection of the failure to understand until recent years the ways in which medical needs inter-relate with social, psychological and other needs and the importance, therefore, of caring for the patient, wherever possible, within his normal environment of living. Because this has been insufficiently appreciated, the Community Services have suffered from an over-concentration of resources in the hospital sector. The health centre, embodying the team approach, is the means of redressing the balance. A shift of emphasis in this direction would not only benefit the patient in the prevention and earlier detection of illness. It could also result in a more economical use of the total financial and other resources available for medical and social care to the extent that it reduced the need for expensive curative treatment in hospitals.

The health centre is also the medium through which recent advances in knowledge and research relating to general practice, and the work of the new academic departments of general practice, can be put to good use, assisted and stimulated.

*The need to Attract an Increased Number of Doctors into General Practice*

Young and able doctors, who are being increasingly exposed during their training to new thinking and new approaches to medical care, will be increasingly disposed to work in general practice. They will be looking, however for opportunities to relate their knowledge and skills with those of allied professional groups; for proper accommodation, equipment and facilities and for good conditions of service. A well organised health centre, and the team approach, could be as attractive for them in the future as hospital work has been the preference of so many of them in the past.

*General Practice in Dentistry*

The future of dental care will be increasingly concerned with ensuring for the population as a whole a healthy natural dentition rather than with the treatment of dental caries. If progress is to be made in this direction continuous attention will have to be paid to the education and influencing of the adult population in matters relating to their own dental health and that of their children. The efforts required to combat the current widespread ignorance and neglect in this area will be immense and it is highly doubtful that significant progress will be made if the dentist continues to do his work, as he does at present, in isolation from the total health team. If he were to be a full member, possibly based in the health centre, he could obtain great assistance and support from his collagues in the implementation of new approaches to dental care whilst, at the same time, obtaining much more satisfaction from his work. Strong efforts should be made to overcome those difficulties connected with remuneration and allied matters which at present constitute barriers in the way of his full integration.

*The Reorganisation of the system of Health and Personal Social Services in Northern Ireland*

The general practitioner has consistently fought hard to maintain his independence and the individuality of his approach to his work. This has brought him many benefits in the past and can continue to do so in the health centre setting. If the general practitioner, however, is to make a full and positive contribution within the reorganised system of health and personal social services in Northern Ireland, and ensure an important and distinctive role for general practice, a better organisation of general practice is required. This would do no more than put general practice on a more equal basis with other parts of the medical service such as the hospital and local authority services, where, in the past, the degree of organisation has contrasted sharply with that of general practice. A well organised health centre, and an effective team contributing to the planning and execution of forms of care in the community, would provide a strong focus of resource and effort, with a degree of control over its own affairs, to relate and consult with the

new District Teams and, through the medical advisory committees, with the Area Boards.

To make a final point, the arguments from principle and from the practical needs of the situation for the development of the health centre concept, are supported by the evidence of what has actually happened and what is planned to take place with regard to health centres in Northern Ireland. Chart I gives details of the growth of health centres to date and the plans for further development to 1975.

CHART I. *Health Centre growth in Northern Ireland—Estimate*

| *Item* | 1966/67 | 1967/68 | 1968/69 | 1969/70 | 1970/71 | 1971/72 | 1972/73 | 1973/74 | 1974/75 |
|---|---|---|---|---|---|---|---|---|---|
| Centres | 2 | 3 | 12 | 18 | 22 | 29 | 35 | 48 | 63 |
| Doctors | 6 | 10 | 51 | 88 | 99 | 126 | 153 | 228 | 379 |
| Patients | 11,000 | 17,000 | 85,000 | 162,000 | 200,000 | 252,000 | 315,000 | 455,000 | 745,000 |

It will be noted that by 1975 it is expected that 379 doctors, or 50 per cent of the total of general practitioners now in Northern Ireland, will be working in health centres. In view of the extent of what already exists, and the magnitude of what is planned, it is vital that the members of the profession give serious thought to the whole concept of the health centre approach; its purposes and objectives in regard to medical care; its place in the reorganised system of health and personal services and a number of important matters of operation and management.

## B. THE ORGANISATION OF COMMUNITY CARE AND OF THE HEALTH CENTRE

*The organisation of community care, in the context of the new Area Board and District structure, and the management of the health centre, should be achieved through the establishment of a community care committee based on the health centre; the appointment of a management sub-committee from the main committee with responsibility for the administration of the centre and the appointment of a health centre administrative officer*

### *The Community Care Committee*

The community care committee would contribute to the planning of programmes and other forms of care and would share in their delivery in collaboration with the new Area Board and District structure. Its functions would be to integrate the various services and professional groups in a team approach to total patient care in the field. Community care committees should be established throughout Northern Ireland for a minimum population of 25,000 and a maximum of 50,000. This would mean that, outside Belfast, each District would have either two or three community care committees.

The way in which the community care committees would complement the reorganised system of health and personal social services is illustrated in Chart II.

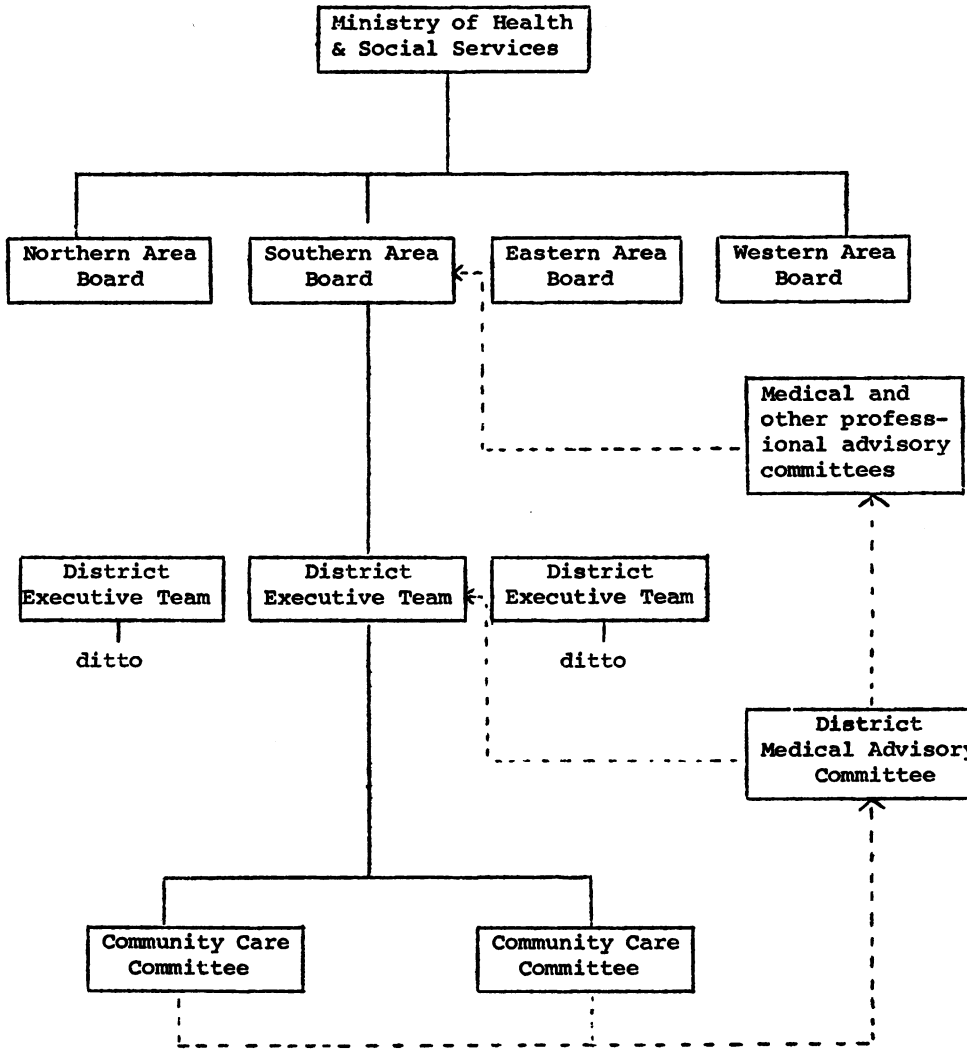


CHART II. *Proposed Community Care Committee in relation to the Area Board and District structure*

The suggested composition of such a committee, based on a health centre for a typical population of 25,000, is given below:

Representatives of the general practitioners.
One representative from the community doctors and dentists.
One representative from each of the following:
- Health visitors
- District nurses/midwives
- Social workers

Secretaries and receptionists
Para-medical (physiotherapists, chiropodists, speech therapists, etc.)
Hospital (representative from the Medical Staff Committee)
General dental practitioners

It might be advisable also to have one or two representatives from the public to advise on the views of the patients using the health centres or the services of general practitioners and others outside the centres. They might be appointed from District Committees.

General pracitioners might be represented by one member from each partnership group and single handed practices would be grouped each to provide a representative. A representative from the hospital medical staff committee would assist in the integration of services at community level and likewise a general practitioner member of the committee should be appointed to the hospital medical staff committee. All general practitioners in Northern Ireland should be represented including those who, although not working in health centres in the provincial towns, would carry on with their practices in the surrounding villages and rural areas. Health centres in the Belfast areas tend to be smaller, but community care committees could be formed by grouping two or three smaller centres into one for purposes of representation.

The committee should meet regularly to plan and co-ordinate all programmes of community care and for discussion of policy matters in relation to the health centre.

*The Management Sub-Committee*

This committee, to be appointed from the main committee, should consist of the chairman and one or two members. It would be concerned with the day to day administrations of the health centre and oversight of the work of the health centre administrative officer.

*The Administrative Officer*

With the building of larger health centres (at present a health centre caring for a population of 25,000 would have some 55–60 staff) a new approach to the management of health centres is necessary. Management functions at present are being carried out by a number of people and groups including doctors, nurses, senior secretaries, county health committees and others. In circumstances such as these, uncertainty about responsibility and a lack of co-ordination could develop with undesirable effects on morale and the proper use of the time of professional and other staff.

A professional administrative officer is needed to act as co-ordinator, to be the focal point of responsibility and generally to administer the work of the centre under the direction of the community care committee and its management sub-committee. The administrative officer could be appointed by the community care committee and his salary paid by the Area Board, possibly with a contribution from the general practitioners. In this way, and since he would report to the community care committee, he should have the confidence of the doctors and

other staff and become a member of the caring team. Various matters of qualifications and experience, remuneration and career structure for the administrative officer would have to be examined and resolved but there is no reason to think these would present great difficulty if the principle should be accepted as sound. The appointment of an administrative officer would enable doctors and others to concentrate on care for the patient, which is their chief concern and training, and delegate matters of administration to a person who is properly trained and qualified for this different activity.

### C. The Community Care Team

The whole tenor of this paper assumes an approach to community care teams, working from health centres and general practices, which recognises the variety of professional skills which need to be integrated on an equal basis to care for the patient. A diagrammatic representation of this team is given below in Chart III.

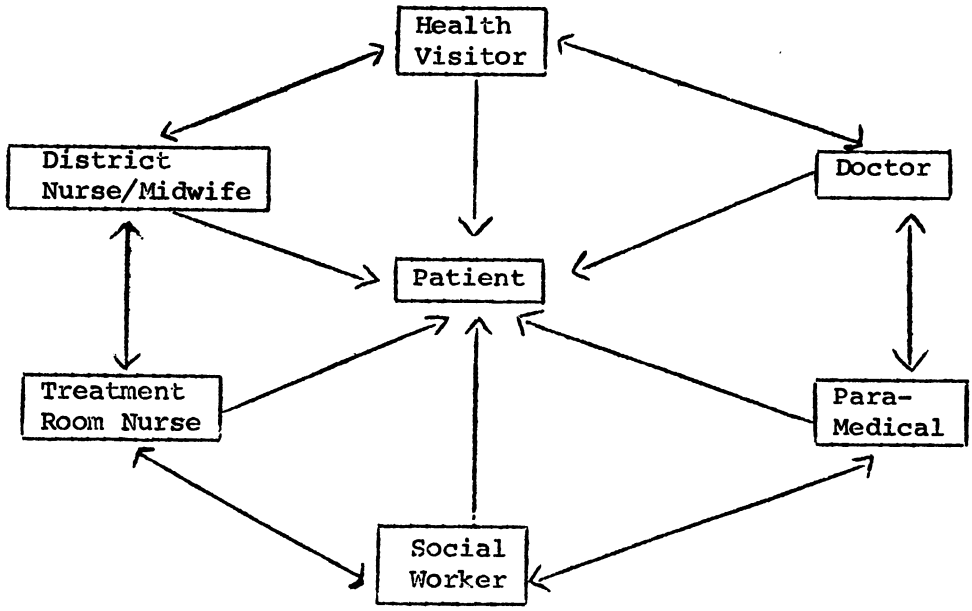


Chart III. *Community Care Team*

Many, if not most, doctors have little experience of the ways in which such a team might function and insufficient knowledge of the nature and scope of the services which members of the team other than themselves could offer. There is therefore a great need for training, including regular discussion within practice teams of case situations; wider discussions within community care committees and discussions and education at regional level such as the Royal College of General Practitioners and the British Medical Association.

Some notes on the role and work of various members of the team are set out below.

*The Health Visitor*

She should be attached to the practice and do her work with no geographical boundaries. It is desirable that family doctors should be consulted and participate in the interviewing and selection of all health visitors and nurses.

*District Nurse/Midwife*

Like the health visitor, she should be attached to a practice and do her work with no geographical boundaries. She should spend at least one week each year in the treatment room and one week in hospital. With the virtual disappearance of domiciliary midwifery, the general role of the district midwife needs to be radically reconsidered.

*Treatment Room Nurse*

She should work permanently in the treatment room and should not be a district nurse. She requires special training in hospital casualty departments and out-patient clinics. She also requires training in resuscitation and should accompany the doctor on accident calls and cardiac emergencies. The Maystown report drew no distinction between home nurses and treatment room nurses. With the increase in numbers of treatment room nurses, and with the need for specialised training, a new career structure for these nurses is necessary.

*The Social Worker*

There is a strong case for the attachment of the social worker to health centres or practices if she is to become a full member of the community care team. A confident working relationship between social workers and medical practitioners should be developed, expressed, for example, in a full exchange of relevant information regarding patients.

*Secretaries/Receptionists*

Appointments to these posts and allocations of work should be done by the community care committee or its management sub-committee. Receptionists should be attached to practices and become members of the community care team and recognised as such by the patient.

## D. Records

A matter of considerable concern to patients about health centres is the confidentiality of records. It might be thought that all staff members working in health centres should make an affirmation in regard to confidentiality and should be continuously reminded of the importance of the matter.

The material in this article reflects the views of a group which was neither specially selected nor representative of the general practitioner members of the two professions concerned. It is hoped, nevertheless, that it will stimulate wider thought and discussion about important aspects of the future pattern of medical and social care in Northern Ireland.

Acknowledgements in regard to this article are made to the members of the Ballygally management course: Dr. D. T. Patton, Dr. J. J. Doherty, Dr. R. J. Millar, Dr. M. Williams, Dr. J. R. Cole, Dr. D. L. W. Chapman, Dr. I. Gordon, Dr. G. W. C. McCartney, Dr. J. D. Tate, Dr. M. G. McVerry, Dr. C. J. H. Mitchell, Dr. G. McNeice (Medical Practitioners); Dr. P. J. R. Griffith, Dr. J. M. Colgan, Mr. J. Harpur, Mr. T. W. Unsworth (dental practitioners).

*Published by arrangement with and under the auspices of the N.I. Council for Postgraduate Medical Education.*

# BOOK REVIEWS

## BASIC MEDICAL EDUCATION. By David Sinclair. (Pp. 212. £2.40). London: Oxford University Press, 1972.

IN its technical aspects medical education in the United Kingdom is traditionally amateur. Curricula conform only within the widest of guidelines; teaching methods and performances are rarely assessed; examinations are often antiquated in concept and execution and the results rarely validated; the syllabus is organised frequently with the convenience of teachers the over-riding desideratum and in its balance (*sic*) evidencing the personal interests (or prejudices!) of the most influential Faculty members; curricular duties are considered by most staff to be an avoidable chore; and until recently the Dean and his assistants (if he had any) were usually full-time academics. Some of these are inevitable given the structure of medical school staffing—professorial units are a recent creation; but others stand as indictments. In contrast the *objectives* of undergraduate education, though never inspiring a complete consensus, have been readily stated and more uniformly accepted; the responses by U.K. Schools to the Medical Act (1858), and the Flexner (1910, 1912), Goodenough (1944) and Todd Reports (1968) have been (under the permissive eye of the G.M.C.) considering the inflexibility of "institutionalised" curricula, with a few exceptions encouraging, and the new Schools in particular have been positively adventurous. Nevertheless, the aura of amateurism remains: the (American) *Journal of Medical Education* started in 1926; the *British Journal of Medical Education* only in 1967, five years after its Indian counterpart!

Increasingly this ennui is being redressed, the author of the present book contributing over two decades. The book is therefore authoritative with a practical rather than discursive style, and though necessarily superficial in some of its treatments, seems to the reviewer an admirable simple handbook for anyone with (or without) interests or responsibilities in the field. It is in three parts: Part I (4 chapters) deals briefly with the historical swing of medical education and its contemporary components—students, teachers, and Schools; Part II (4 chapters) considers curricula, learning and teaching methods, means of assessment, and the problem of introducing a new syllabus; and Part III (one chapter) is a general appraisal. There are appendices on specimen curricula (including that from Western Reserve), a 246 item bibliography, and an excellent index. The writing is clear, succinct, and in places the writer sustains an agreeable narrative style. In fact on all counts a successful single volume overview for the general Faculty member of many of the practical points of teaching and examining modern medical undergraduates.

P.F.

## LEGAL ASPECTS OF MEDICAL PRACTICE. By Bernard Knight. (Pp.viii+280, 33 illustrations. £3.00). Edinburgh and London: Churchill Livingstone, 1972.

IN this new book the author, an experienced forensic pathologist of considerable standing in medico-legal circles, breaks fresh ground. Unlike many of his predecessors, who were inclined to base their textbooks largely on illustrated examples of their own unique cases and whose manuscripts often included stereotyped, out-of-date material, Dr. Knight has approached his task with originality. As he states in the preface, "For too long the medical schools have been teaching forensic *pathology* at the expense of forensic *medicine*." He points out that the former is a specialised post-graduate subject, whereas the real need of the student, junior doctor and general practitioner is a sound knowledge of medical ethics, an awareness of the laws and regulations concerning medical practice, and an appreciation of the disciplinary and legal consequences of irregular behaviour on the part of the doctor.

With the aim of fulfilling this need, the author has packed a great deal of information into what is really quite a small volume. He gets off to a good start with a chapter on medical ethics, from the ancient Hippocratic Oath to the modern day, and then takes us through the chambers of the General Medical Council, showing us how to avoid contact, in the

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disciplinary sense, by his chapters on medical negligence, consent, certification, and the doctor's duty to his employer. Further chapters enlighten us on compensation, the Coroner and the Courts, and the duties of a doctor at the scene of death. There is an interesting, albeit brief, discussion on the topical issue of organ transplantation.

In the clinical chapters of the book Dr. Knight deals in a most interesting way with sudden natural and unnatural death, wounds, motor vehicle injuries, asphyxia, drowning, sexual and allied offences, etc. These are useful contributions on such important current issues as suddent infant death ("cot death"), the battered baby syndrome, the drinking driver, drug legislation and the legal aspects of mental disorders.

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D.J.L.C.

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There are only minor differences between the third edition and the second. Some newer topics such as prostaglandins and cyclic AMP are now included and all units have been converted to the S.I. unit system. The successful style and format have been retained. However, the cover is blue instead of yellow.

I.C.R.

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THERE has been growing tendancy in the last few decades to think about disease in terms of breakdown of normal function rather than in terms of the end results of the pathological change. Though the latter approach is necessary in diagnosing disease by pattern recognition, the former approach permits a greater understanding of the disease and puts the doctor in a much better position to think intelligently about its prognosis and treatment.

This short and well written book will be helpful to doctors and students who are interested in the latter approach. The book describes the physiological consequences of organ failure as it affects the cardiovascular, respiratory, renal, haemopoietic and other systems. The section on the nervous system, which was not written by Professor Kelman is rather different.

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Vital statistics, epidemiology and preventive medicine in general practice and the organisation of the health services are dealt with in other sections.

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Demographic factors, the population explosion, variation in biological characteristics, the methods of comparing two or more population groups are not adequately covered.

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J.P.

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This is an interesting book characterised by considerable strength and also weaknesses. One strength is that it is very readable, and frequently uses simple illustrations, to put across a point. The chapters on explanation of psychopathology, laboratory models and other models from which we might learn about the development of mental disorders all seem to provide good introductions. The book, however, covers such an enormous number of different fields that it can often do scant justice to an area. Chapters trace factors in the causation of mental disorders from inheritance through ante-natal and perinatal factors, childhood, adolescence, right into adult life, middle age and old age. The last chapter is on "Methods of Psychotherapy" and again illustrates the difficulty in trying to cover such a large field in one book. For example, the whole of behaviour therapy is covered in three and a half pages.

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IT is unfortunate that most general text books of medicine excepting those from American authors fail to cover the field of the rheumatic disease adequately, and generally separate the 'chronic' rheumatic disease from the acute connective tissue states under separate authorship. Since the bulk of patients in this field are seen by the rheumatologist it is refreshing to find this very comprehensive little book provided to fill this deficiency for the undergraduate and post-graduate medical student.

Although the accent, as the title suggests, is on the clinical aspects, Dr. Dick provides a good deal of the science of the subject in a brief compass. It is unfortunate that the chapter on the normal joint is rather brief and in further additions it is hoped that more space will be given in this section especially in regard to joint fluid examination.

The book otherwise is well balanced, clear in exposition and surprisingly comprehensive. Reference is made to even the rarer causes of polyarthritis while the lumping together of generalised osteo-arthrosis and degenerative disc disease of the spine is useful. Surprisingly, only very brief reference is made to senile ankylosing hyperostosis of the spine, or to its differential diagnosis from ankylosing spondylitis and it fails to be listed in the index. The practice of considering the pathology and aetiological factors after the clinical account of the disease makes for clearer understanding by the student. A selected list of references would increase the value of the book.

Treatment is covered adequately and critically with good attention to detail and there is a very useful section on the drugs used in therapy. Many would question the advice that salicylates are of service in the early stages of ankylosing spondylitis where phenylbutazone has much benefit in prompt control of the condition. The short illustrated section on "The Eye in Arthritis" will help to underline the other frequent references in differential diagnosis. Many other good line drawings clarify the text.

This is a valuable addition to the literature on rheumatology. It is attractively presented, economically priced, and can be thoroughly recommended to students, postgraduates and practitioners. Dr. Dick is to be congratulated on the production of this much needed little book. It contains much of his lively "personality".

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## MANSON'S TROPICAL DISEASES. By Charles Wilcocks and P. E. C. Manson-Bahr. Seventeenth Edition. (Pp. xiv+1,164. Illustrated. £10.00). London: Balliere Tindall, 1972.

IN the field of tropical diseases "Manson's" has been considered one of the classics of all time. This seventeenth edition is in keeping with the high standards and the all-embracing coverage which has been the hallmark of previous editions. The availability of an ELBS edition is an added advantage to developing countries, where tropical diseases are more prevalent, and where this book is very widely read.

The book is divided into sixteen sections including an exhaustive chapter on ophthalmology in the tropics. In addition there are three appendices dealing with the life-cycles of human parasites which make this an important reference book for parasitologists as well.

The tropical anaemias are dealt with in the general part of the book and one would have liked to see a little more emphasis on the aetiology of iron deficiency anaemia, which is still the commonest anaemia in the tropics due to dietary deficiency or malabsorption of iron due to various causes.

Immunological aspects of all major diseases are dealt with under separate sub-headings for each disease, and as a result much new material, and in some instances, an entirely new emphasis is placed on disease syndromes. The sections on disease caused by protozoa, helminths and viruses are excellent and the full scale of clinical preentation, pathology and treatment are presented. The chapter on diseases caused by viruses is greatly expanded and deals with the common and the rare viral diseases. In the chapter on leprosy the significant modern advances in this field have been presented. Diseases such as tuberculosis, salmonellosis and the spirochaetal infection receive much detailed decriptions. The chapter on diseases caused by fungi is also comprehensive. Ophthalmology in the tropics has been discussed in a very excellent chapter. Nutritional diseases such as kwashiorkor, continue to extract their toll in the tropical environment and these have been discussed in depth.

Drugs used in the treatment of tropical diseases are dealt with in a separate chapter towards the end of the book. The appendix on clinical pathology deals with some tests which have not found room in the clinical pathology of individual diseases. These individual sections deal with diagnostic tests which can be performed in the average laboratory.

Those dealing with the diagnosis and treatment of any form of tropical disease, whether it is common or uncommon, will continue to use Manson's as the chief source of information. The references to most subjects are detailed and include the latest advances and the book is therefore also an important starting point for more detailed study. The index is very comprehensive. It is very satisfying that the high standards of previous editions are fully maintained in the present one.

H.B.