VOLUME 49 1980 No. 1

THE ULSTER MEDICAL JOURNAL

PUBLISHED BY
THE ULSTER MEDICAL SOCIETY

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THE ULSTER MEDICAL JOURNAL

NOTICE TO CONTRIBUTORS

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

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

3. References should be restricted to those really necessary and useful. This Journal has used the Harvard reference system. Aware of the burden imposed on authors by the different styles required by different journals it has been decided to support the move by an increasingly large number of major medical journals to the 'Vancouver style'. Papers for volume 50 to appear in early 1981 should conform. Details appear in the British Medical Journal 1979; **1**: 533-535 and in Lancet 1979; **1**: 429-430. Journal titles are to be abbreviated to the style of the Index Medicus or given in full.

4. Scientific measurements should be given in S1 units, but blood pressure should be expressed in mmHg and haemoglobin as g/dl. Traditional units may usefully be given in parenthesis and conversion factors may be stated, especially with tables and illustrations.

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

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

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

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

.....19.....

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THE
ULSTER MEDICAL JOURNAL

PUBLISHED ON BEHALF OF THE ULSTER MEDICAL SOCIETY

VOLUME 49 1980 No. 1

ONE MAN'S PRACTICE

by

E. J. MILLER

General Practitioner, Rathfriland, Co. Down

PRESIDENTIAL ADDRESS TO ULSTER MEDICAL SOCIETY
SESSION 1979-80

CHOICE OF SUBJECT

AFTER recovering from the initial shock of having been asked to allow my name to go forward for President, I began to cast around for a suitable subject for an address. Mr. Gallagher suggested 'The Changing Face of General Practice' but I did not feel competent to speak on it. Change is indeed inevitable but I try to slow its pace for I prefer to hold on to that which I think is good rather than rush to embrace the new. I considered telling you about some of my other interests but I have not studied any of them in sufficient depth to present them to this Society and none of them is remotely connected with Medicine.

I finally decided to tell you about my practice, which is single-handed, how it is run, and what I do in it. I have entitled my address 'One Man's Practice', implying that there are many different ways of running a practice, depending on the attitudes and personality of the doctor and the environment in which he works. Many may think that what I do is the way not to do general practice, but it suits me and seems to suit my patients. For the general practitioners in the audience I will be covering all-too-familiar ground, but there are many in this Society who are not engaged in general practice and it might help them to tolerate us better if they knew something of what is involved in the subject.

With the introduction of a Chair in General Practice at Queen's University, held at present by my old school-mate, Professor W. G. Irwin, the clinical standard of the general practitioner has been greatly enhanced. Those of us who

entered general practice in earlier years, however, have all evolved along different lines and no two of us are alike. This may be no bad thing, for it has offered variety and choice to the patient.

I have been told that there is, in our Province, a doctor who practices from the front seat of his car and patients queue to speak to him through the open window. Those who require more detailed investigation are directed to the comfort of a near-by shed. While many may consider this reprehensible, he has my full admiration, for anyone who can make a living in such a way must have great skill and immense personal magnetism. Provided there is a choice, and I understand that he is not the only doctor in the district, I would consider this infinitely preferable to a patient being forced to see someone in palatial surroundings whom he doesn't like or in whom he has no confidence. Buildings are no measure of clinical acumen.

I intend to deal with my subject in a superficial manner, for general practice is a broad subject rather than a deep one. Bearing in mind that there are usually many non-medical members in the audience at the opening meeting of the session, I hope to reduce technicalities to a minimum.

As past pressures have made me what I am, it will be necessary for me to give you a brief autobiography to enable you to understand my present position.

AUTOBIOGRAPHY

I was born in Toronto, Canada, and am still a Canadian citizen. My father died when I was six and my mother returned with me to her native Belfast. I was educated at Inchmarlo and Inst and on passing the Senior Certificate in 1941 I tried to join the Royal Air Force but was told I was too young. On the way home I called with a friend who lived behind Queen's University and he told me that he was going to study medicine. I was interested, so I collected the entrance forms to the Faculty of Medicine at the Registrar's Office and submitted them to my mother that night. She said that I could go to the university if accepted and I commenced studies in October 1941.

I qualified in December 1946 and was admitted to my first job in the Belfast City Hospital as house surgeon to the late Mr. H. P. Hall and Mr. Maurice Lavery, and developed a deep admiration for them both. I was then moved to Ava I and III as houseman to that forceful physician, Dr. S. R. Armstrong, whose vaccination classes are unforgettable. After this I was persuaded to accompany my colleague, Dr. Trevor Lawson, to Banbridge Hospital, the Light of whose Life lived, at that time, in Lurgan. Here we worked under Mr. H. W. Gallagher, whose prowess as a surgeon I have described on a previous occasion.

In July 1948 I went to Rathfriland to do a six weeks locum for the late Dr. John Shannon – and I have been there ever since! It was my ambition at the time to take a higher degree and return to my native Canada and I intended to leave Dr. Shannon as soon as we had cleared up all the work. Alas, this was never accomplished and I became even more deeply involved. It certainly was never my intention to stay in general practice for I was hospital orientated at the time and I longed to return to the warmth and security of hospital life.

Dr. Shannon was a superb doctor with immense energy and a tremendous sense of humour. He taught me a very great deal, including how to apply dental and obstetric forceps; there was ample opportunity to perfect one's skill in both for neither fluoride nor the 'Pill' had made their appearance on the horizon. The practice covered an area of some 300 square miles, and although Rathfriland was a small town, the surrounding country was thickly populated. The practice increased from 3,000 to 6,200 before the 1952 Danckwerts' Award, implemented in 1953, limited the figure to 5,500 for a principal and assistant.

The work-load was heavy, especially when either of us was on holiday. In 1948 I recorded having seen 127 patients in the surgery in one day. Home visits numbered 20 to 40 per day and once, when Dr. Shannon was on a fortnight's Refresher Course, my daily mileage averaged 120 miles. Needless to say, consultations were brief and notes were seldom taken. Most of the complaints were trivial but some serious conditions were mixed up among them and had to be watched for carefully. Having made no notes, I had a persistent worry in case something had been overlooked.

When conducting a surgery on my own I had the receptionist sitting at the desk, blocking out the prescription forms and the certificates as soon as the patient entered the room; she would write in the drugs or diagnosis as I dictated them to her and I only had to add my signature. One could always tell when a patient wanted to talk privately by the glint in their eye and such a patient would be shown into a separate room. With this system, some sixty persons might have been seen in two hours, after a fashion.

Home visiting had to be pretty brisk too to get all fitted into the day and to get back in time for the surgeries. Most of the obstetrics was carried out in the home and a diurnal maternity case could completely disrupt one's routine. The community was new-fangled at the idea of being able to call out a doctor at any time without having to pay him, and to be up five nights a week was not unusual. Not to get to bed at all for three consecutive nights was rare but did occur from time to time. 1948 to 1951 were probably the worst years and after that the population settled down.

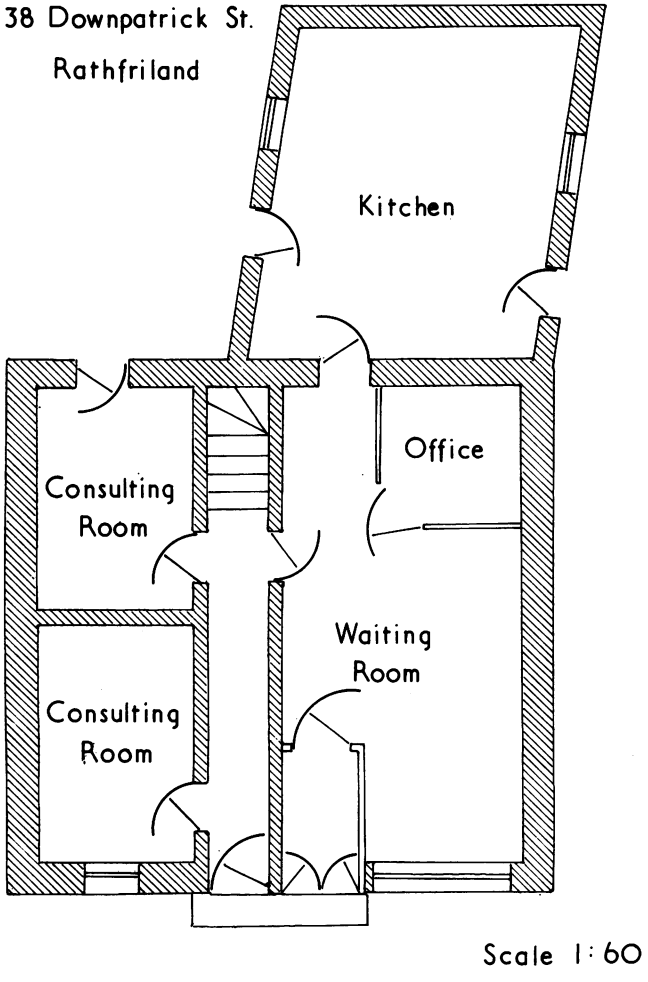
During this time one was kept up-to-date by meetings of the Banbridge Medical Club which met monthly and was addressed by many excellent speakers, including several Past-Presidents of this Society. Dr. T. T. Fulton was Physician to the Banbridge Hospital around this time and, as everyone knows, to read two of his reports covers the membership course pretty adequately!

In 1955 I read Lord Stephen Taylor's book "Good General Practice' and I developed a burning desire to put his precepts into action. An opportunity arose at the end of 1956 when the late Dr. Speedy retired. In February of the following year I bought an old public house and converted it into practice premises in which I still work. Some might consider it almost sacrilege to turn a public house into a surgery but I like to think that, as in former days, people leave the premises a little happier than when they entered!

I commenced practice in them on the 1st April, 1957.

THE PREMISES

As can be seen from the diagram (Figure), the ground floor consists of two rooms separated by the hall from the shop. The front room measures 12′ by 8′ and the back room 11′ by 8′. They are not too difficult to heat and the rear room has



a door opening into the yard which allows rapid ventilation if one has just dealt with a patient who has never heard of 'Lifebuoy'. The shop measured 24′ by 12′ and I converted it into a waiting room by removing the numerous shelves and counters, deepening the porch, and erecting a receptionist's office in the opposite corner. The door of the office opens outwards to allow maximum use of its floor area and the walls consist of wood and glass panels, the wood being carried to a sufficient height to prevent the patients feeling that they are

under constant supervision by the receptionist and the receptionist from feeling that the patients are breathing down her neck. The telephone is installed in the office and the clinical records are stored there. An intercom system operates between the office and the downstairs rooms, each of which has been furnished as a consulting room. There is accommodation for twelve patients in the waiting room and the heating is by oil and, in very cold weather, a Superser Gas Heater as well. From the beginning I have had a mains radio in the waiting room. The effect has been most interesting – when the radio is on, the patients either listen to it or shout above it. When it is off or away being repaired, they sit like wooden Indians – the sort that used to be seen outside tobacconist shops in North America – staring blankly at the opposite wall and there is no conversation whatever. I have purchased pictures for the waiting room and have been given gifts of others. I hang only one of them at a time as I hate clutter, and the picture is changed each week. Only one of the pictures is valuable.

Opening off the rear of the waiting room is a large back kitchen which I use as a workshop, a store for oil and gas, dressings, laboratory specimen containers, cleaning materials and a rowing boat. In the unlikely event of a flood submerging Rathfriland, I am, to some extent, prepared.

The hall acts as a sound barrier between the waiting room and the consulting rooms, thus complying with the requirement suggested by Lord Taylor in his book. The hall is 18′ long and, with a test card on the back of the front door, is of approximate length for testing distant vision. Lately however, I have put marks on the skirting boards at 3 metres for the more modern test card. At the rear of the hall a staircase gives access to six upstairs rooms.

Each consulting room is furnished with a desk, chairs, examination couch and wash-hand-basin, and is in communication with the office. Neither has a phone, so confidences cannot inadvertently be breached. I tend to use the rear room more than the front room as it is much quieter and contains the drugs and dressings. Heavy lorries climbing the hill up into Rathfriland can make auscultation in the front room almost impossible but not so in the back room.

Not to have been purpose-built, the old pub lent itself very well to my requirements without much alteration. Having two consulting rooms is an enormous advantage for one can, when pressed, deal with two patients almost simultaneously. When one leaves the room to allow a patient to get undressed or pass a sample of urine, one can take the next patient to the other room and get started without loss of time.

Although I don't make a practice of it, watching a patient get undressed can be quite revealing! I became interested when one old lady consulted me during a heat-wave in May 1968 and seemed to take an inordinate time in disrobing. After examining her, I surreptitiously made a list of her garments as she redressed. The items were as follows:

Vest, heavy knickers and stockings.
Flannel nightdress.
Pyjama coat.
Yellow cardigan.
Second yellow cardigan.
White shirt.
Green striped dress.
Pink blouse.
Heavy pleated skirt.
Heavy linen jacket.
Straw hat.

When she returned a week later, on the 14th May, I did not ask her to strip completely but I was interested to see what she was wearing. The list runs as follows:

Dark green pullover.
White vest.
Mustard cardigan.
Moss-green cardigan.
Dark blue cardigan.
Red pullover.
College blue cardigan.
White silk scarf.
Two heavy tweed skirts.
Brown jacket.
Thick tweed jacket.
Plastic raincoat.

According to my diary the 14th was a mild wet day, hence the raincoat. Now one might assume that the old lady was carrying her wealth on her back but this is not so. She owns a farm of 70 acres, and at a possible £1,000 per acre, she is not exactly in penury.

As can be imagined from the diagram, there is a flow, albeit intermittent, of patients into the waiting-room, thence to the consulting-room, and finally out through the hall door into the street. They are thus spared the embarrassment, especially if they have kept me an excessive length of time, of returning through the waiting-room to face the hostile stares of those still waiting to be seen.

When compared with modern specially-designed publicly-financed clinics these premises leave a lot to be desired, but they are compact and functional, and I can take some comfort from the words of Professor C. Northcote Parkinson when he writes, with his tongue in his cheek, 'Lively and productive institutions flourish in shabby and makeshift surroundings. A perfection of planned layout is achieved only by institutions on the point of collapse. Perfection of planning is a symptom of decay. Perfection is Finality and Finality is Death! The Palace of the League of Nations was not opened until 1937, by which time the League of Nations had practically ceased to exist'.

PRACTICE FROM 38 DOWNPATRICK STREET

On moving to the new premises I decided to change my method of working and to set new standards for myself.

First, I decided never to see a patient without having their clinical record in my hand or, failing that, a notebook in which I could write down the history and clinical findings.

Second, I resolved to try to solve every problem as it presented and to complete each task before moving to the next. In former days, when seeing 30 patients per hour, if anything sticky turned up likely to impede the flow of

consultation, I would ask the patient to return three days later, hoping that on that day I would be less busy. In point of fact, I was usually busier than I had been on the first day and detailed enquiry would be further postponed. This tended to swell the numbers at each succeeding surgery till the back-log reached frightening proportions. One knew instinctively that there was very little wrong with any of these patients but a single examination usually reassured them and terminated their frequent visits to the surgery.

Third, I decided to monitor the practice from a number of different aspects, some of which I shall describe to you later.

The Practice Week

I try to work hard on Mondays, Wednesdays and Fridays, and to free-wheel on Tuesdays, Thursdays and Saturdays. I don't believe in working on Sundays and am seldom called upon to do so. My receptionist takes her half-day on Tuesdays and stays in my home to pass messages to me in Belfast on Thursdays, hence my being able to be present here tonight.

The Consultation

The purpose of the consultation is to establish a diagnosis and to institute effective management or treatment. Diagnosis is usually made by listening to the story of the patient's illness and examining his person afterwards. Lord Taylor states that the tradition of English clinical teaching is to learn everything possible by clinical examination alone; to call in diagnostic aids only when clinical observation fails to give the answer; and to entrust these technical aids to those skilled in their use and interpretation. He avers that it is part of the pride of many English doctors, scientists, and lawyers, that they are oblivious to all but the essentials of their environment. They would suggest that it is the quality of the mind rather than the trimmings which matter and view the external manifestations of efficiency as meretricious etceteras, in all probability designed to hide an intellectual vacuum. To me, these high-flown sentiments contain more than a hint of inverted snobbery but, working as I do in a remote location, I find that I have to follow them.

Taking the History

Being aware of my diagnostic limitations, I listen attentively to all that the patient has to tell me, for often an apparently trivial detail may prove to be the essential clue to the solution of the problem. The detective-novelist R. Austin Freeman has his character, Dr. Thorndyke, say that 'The evidental value of any fact is an unknown quantity until that fact has been examined. All facts should be collected impartially without reference to any theory and each fact, no matter how trivial or apparently irrelevent, carefully studied'.

One Saturday morning several years ago, a mother-of-three came to see me privately. She was in great distress. She had been seen by two gynaecologists and didn't know which to believe. The first, whom we shall call 'A', had carried

out a number of operations on her cervix for recurrent cervicitis and had finally told her that the time had arrived for hysterectomy to be performed; he said that he was reluctant to do this as he felt she was psychologically unsuited for it but that nothing else would relieve her intense hypogastric pain. She had asked to be referred for a second opinion and she had seen gynaecologist 'B' a couple of nights before coming to see me. He had examined her and said that she didn't need her womb removed.

I was puzzled by the many relapses after diathermy and even amputation of the cervix and I let her run on for a while. It appeared that she had had a rather bad tear at the birth of her last baby and then she let slip that she had been unable to retain the enemas prior to the operations on her cervix, the fluid escaping from the vagina. A possible cause for the relapse was now apparent and it only remained to demonstrate the unnatural opening. I realised that each of my gynaecological colleagues had been covering the clue with his speculum. I passed a Spencer-Wells forceps into the anus and you can imagine my delight when I saw it project into the vagina! I now have some idea as to how Archimedes felt, for it was with difficulty that I restrained the urge to rush into the street to invite passers-by to witness my discovery!

I telephoned Mr. 'B' and told him what I had found and he advised me to notify Mr. 'A'. Mr. 'A' was not impressed and said it would have no bearing on her problem, so there I had to let the matter rest. About 18 months later I met Mr. 'B' who said that he had recently been at one of Professor Macafee's Clinics and this patient had been presented. The patient had been attending the Clinic for over a year and eventually one of the registrars had found the recto-vaginal fistula and plans were afoot to close it. I regret that, unlike Columbus, I was unable to mark my discovery with a flag!

Where the language is colourful, I follow Professor Lindsay's dictum to record the history in the patient's own words. In 1961 a perky 74-year-old visitor from Vancouver made an appointment with me for a 'complete check-over'. He had been in the Mounties in earlier life and was very spry for his age. Before commencing the examination I asked if he had had any serious illnesses. 'Nope!' 'Have you had any operations?' 'Nope – Yip! –I had an operation for piles about three years ago – and that was the end of sex for me! – and', he added ruefully, 'I'd just been married three months!' 'I went round to the doctor afterwards and I said "Doctor, when you operated on me last month' I reckon you must have *pared too deep!*".'

The Examination of the Patient

Time is an important factor in every human pursuit but it is especially important to a doctor on his rounds. Voltaire has pointed out that nothing is longer than time, since it is the measure of Eternity, but he goes on to say that nothing is shorter, since it is insufficient for the accomplishment of our projects. Nevertheless, since clinical examination need not be lengthy to be thorough, there is seldom any excuse for not examining a patient.

I usually begin by placing a thermometer under the patient's arm before starting to take the history. I prefer the axilla to the ends of the alimentary canal for it allows the patient to talk while the temperature is being recorded and obviates the necessity for cleansing and sterilising the thermometer afterwards. Adding one degree Fahrenheit to the result gives a figure sufficiently accurate for my purposes.

In the home, patients are usually confined to bed, and I have found that they can most rapidly be examined with the minimum loss of heat by first whipping the bedclothes down to the foot of the bed. Testing the plantar relexes, looking for oedema, checking for meningism and joint stiffness in a matter of seconds. The legs can then be covered while one looks for herniae, and superficial glands in the groins, axillae and neck. When a hand has been passed over the abdomen, this too can be covered while attention is paid to the heart, front of the chest, neck and upper limbs. When the patient sits up, I palpate for sacral oedema, auscultate the back of the chest, and then look at the throat. Eyes, ears and nose can be inspected when the patient lies back on the pillow. This can be achieved in less than two minutes, the patient does not become excessively chilled and a synoptic view of the patient as a whole has been obtained. If an abnormality is discovered, the portions of the body not being examined can be covered while it is scrutinised more carefully.

I follow much the same pattern in the surgery but here the patients are not usually feverish and their complaints tend to be of a more long-standing nature. Once again I begin at the feet and work up to the head, proceeding from the simplest to the most complicated part of the body. Many books on clinical medicine tend to examine the body system by system, but I think that to do so keeps the patient undressed for an excessive length of time. Of course, when writing up my notes I unscramble my findings into systems for subsequent rapid referral.

Examining the feet can be a rather unpalatable procedure. One young farmer with impaired vision stuck a graipe through his right foot one Thursday afternoon as I was preparing to leave for Belfast. I wasn't feeling very well at the time and was completely stuffed up with the cold. When he removed his boot there arose a miasma which, within three seconds, penetrated the innermost reaches of my skull and I was able to breathe freely for the next 36 hours. I have often wondered if this vapour could have commercial possibilities. It certainly lent some credibility to the local radio announcement that 'If the farmer who left his socks on the 4 o'clock bus on Friday will call at the bus station he can have the bus!'

Investigations

As a result of the history and examination the diagnosis may be self-evident, but if it is not, I list the possibilities and plan a number of laboratory tests to sort them out. If the diagnosis is still obscure I seek the help of a consultant.

I treasure the access to the laboratories, of which I have a choice of three, and, chiefly through habit, I use that at the Belfast City Hospital almost

exclusively. I would like here to pay tribute to the courtesy and efficiency of its staff, who have given me valuable advice on several occasions, suggesting tests that I did not know existed. Where appropriate, I also send samples to the Virology Department in the Institute of Clinical Science.

I am not really interested in open access to radiology departments except for X-rays of the chest for school-teachers, scuba divers and the like. As most of the lesions likely to be discovered on X-ray such as carcinoma of the stomach, gall-stones or pulmonary tuberculosis will have to be referred to the consultant in the long run, one may as well involve him from the start. Hospital consultants may have some idea of the work-load of their radiology department, but I, having none, might well swamp it.

Indeed I am glad *not* to have open access to X-rays for I might be tempted to have a patient X-rayed just in case something might turn up, and I do not think this is an adequate reason. I might also be spuriously reassured by a normal finding. I remember one man in his sixties, in hospital for three weeks for investigation for loss of appetite and strength, being sent home with a note saying that nothing abnormal could be found and that the barium meal was normal. On the night of his return home, his wife asked me to see him as he had just vomited half a bucketful of thin blackish fluid. When I visited him he had, in his epigastrium, a visible and palpable pointed craggy mass projecting like a miniature Rockall. A Past-President of this Society confirmed its presence and took him into his hospital. Repeat barium meal was again normal but laparotomy revealed an extra-gastric tumour.

In 1964 a short, stout woman consulted me for loss of appetite, weight and strength and, to my dismay, I found a lump the size of a goose egg in her upper abdomen. Fearing she had a carcinoma of the stomach I referred her for an urgent surgical appointment. Barium meal proved normal and arrangements were made for review in eight week's time. When she returned for the report the lump was still present so I referred her to another surgeon privately. He performed a left hemi-colectomy for a large adenocarcinoma of the colon. She had a local recurrence successfully removed by abdomino-perineal excision in 1974 and is still alive and doing well. In fact she and her husband visited their daughter in Smithers, British Columbia, this summer.

Clinical examination still has much to offer and I must say that I am deeply impressed by the high clinical standards exhibited by the recent outputs of our Medical School.

Treatment

Having made the diagnosis, final or provisional, one sets about organising treatment. Here a general practitioner may consider himself as seated at the console of a mighty therapeutic organ with a choice of manuals and stops. The great manual might be represented by those massive tomes, the British Pharmacopoeia, the British Pharmaceutical Codex and Martindale, and by the National Formulary. The swell manual might be represented by MIMS – the Monthly

Index of Medical Specialties – which is a list of the current proprietary drugs available, while the choir manual, mainly used for accompaniment, might represent the social services and their many workers. The pedal organ will represent those grand old fundamentals, aspirin, baking soda, and castor oil !

The ranks of stops on each side may be grouped in clusters of physicians, surgeons, obstetricians, paediatricians, geriatricians . . .each stop having its own function and tonal quality. Even as the pipe organ has its many registers, so has the therapeutic organ its abundant registrars. In the past, when selecting a consultant, I tried to match the temperament of the consultant with that of the patient so that harmony might ensue, but now, with so many registrars intervening between me and the consultant, I cannot be so artistic. I have nothing whatever against registrars for I am sure they do most excellent work, but they seldom stay long enough in the one place for me to get to know them and assess their various capabilities.

To ensure that patients see the consultant of my choice, I recommend them, if they can afford it, to seek a private consultation. Naturally I can only advise them to part with their money to a specialist whom I know to be both competent and conscientious, and for me to have formed such an opinion, he must have done good work on my general patients. I believe that private practice within or alongside the Health Service can be beneficial by stimulating the need for maintaining or raising the standards of care. In my opinion, C.O.H.S.E. and N.U.P.E. have adopted a myopic attitude in opposing it, for those whom they seek to protect are those who are likely to suffer most.

Some consultants have silver tongues while others are very down to earth. Some are verbose and expansive, giving many patients great confidence, but some patients are suspicious of anyone who talks too much. I remember referring one such man to a consultant who was inclined to be rather dry and uncommunicative and warned the patient not to expect him to say too much. Quietly he said to me "Them as *knows* most *says* least, and them as *has* most *gives* least."

Home Visits

Not all the work of the practice is done in the surgery, for home visiting still provides a significant though diminishing proportion. It seems to have died out completely in the United States but I would not like to see it disappear altogether for I enjoy driving round the countryside admiring the scenery, the vegetation and the animal life. The country is particularly beautiful in the Spring but each season has its own charm. Acute infectious disease, cardio-respiratory disorders, the acute abdomen and geriatrics are the main reasons for these visits. Now that more people own cars, more come to the surgery. A dearth of fuel may soon reverse the balance.

Receptionists

To assist me in my work I employ a receptionist. In 22 years' practice from Downpatrick Street I have employed three receptionists. The first left to get married after nearly two years, the second left to train as a nurse after nearly three years, whilst the third, a married woman, is still with me. They have all been excellent and none of them has had any special training for the job. Indeed, I would prefer someone who wasn't trained and who was not in possession of any fixed ideas. It is not difficult to show them what one wants and they can pick up the essentials pretty quickly. I would be more concerned that they had a pleasant personality and a friendly and helpful attitude towards my patients than that they should be geniuses in their own right. Happily they have all been very bright as well as considerate towards the patients.

From the beginning I have paid them all a bonus as well as a salary. I increase the salary by small amounts twice a year and the bonus is related to the number on the list and to the maternity fees and immunisation fees which I receive for the quarter in question. As the latter tend to fluctuate, so the bonus is greater at times than others. I think that the variation in remuneration of an employee with the ebb and flow of business gives them a sense of involvement, and makes them almost partners. My receptionist makes no demur when her pay cheque is down but I do get puzzled inquiries from the Central Services Agency. Perhaps trade unionists would not approve.

My receptionist knows the practice almost better than I do and her duties are many and varied. Locums always compliment me on her and I am fully aware how lucky I am. I know that some doctors regard their receptionists as buffers between themselves and the patients but I prefer to regard mine as a link.

THE STATISTICS OF THE PRACTICE

Volume of Work

The volume of work is indicated by Table 1. The surgery attendances have steadly increased throughout the years so that the number in 1978 is about twice what it was in 1958. The number of home visits, however, after an initial rise, fell by 1978 to less than half what they were during the nine months of 1957. Adding attendances and visits together gives a fairly constant figure of between 8,000 and 10,000 per annum, while dividing the number of visits into the number of attendances to obtain the A/V ratio shows a progressive rise from 1.13 to 6.69 over the 22 years. The mileage travelled in 1957, some 11,000 odd miles, gradually rose to 20,000 by 1966 before falling back to its original level in 1978.

Mortality and Age at Death

It is difficult to measure one's performance in general practice but two of the yardsticks – note that I am still an imperialist – that I use are the death/rate per 1,000 and the average age at death for each calendar year. The death/rate for Northern Ireland, County Down and the United Kingdom is a fairly stable figure but my death/rate fluctuates widely (Table II). I am bound to lose patients sometime and some years there is a heavier crop than others! A Newry undertaker used to have a sign in his window which said "If you don't die, we can't live."

TABLE 1

Volume of Work in Practice

Year	Surgery Attendances	Visits	Services (Attendances + Visits)	A/V Ratio	Annual Mileage
1957 (9 months)	2950	2613	5563	1.13: 1	11,296
1958	4052	3503	7555	1.16: 1	15,536
1959	4867	3614	8481	1.34: 1	16,695
1960	5016	3329	8345	1.51: 1	16,941
1961	5352	4204	9556	1.29: 1	18,338
1962	5366	3531	8897	1.51: 1	17,937
1963	4539	3286	7825	1.38: 1	18,758
1964	5136	3114	8250	1.65: 1	18,278
1965	5506	2715	8221	2.02: 1	19,669
1966	5120	2937	8057	1.94: 1	20,460
1967	5680	2704	8384	2.10: 1	18,842
1968	6289	2911	9200	2.16: 1	16,616
1969	6609	2408	9017	2.74: 1	15.973
1970	6676	2135	8311	3.12: 1	17,885
1971	6979	1746	8725	3.99: 1	15,266
1972	7169	1675	8844	4.28: 1	15,288
1973	7542	1643	9185	4.99: 1	14,777
1974	8250	1561	9811	5.28: 1	12,546
1975	8204	1512	9716	5.42: 1	13,305
1976	8684	1531	10,215	5.67: 1	13,203
1977	8329	1381	9710	6.03: 1	15,786
1978	8452	1262	9714	6.69: 1	11,419

TABLE II

Deaths in Practice and Mortality Rate

	Number of Deaths			Rate/1000		
Year	Total	Male	Female	Practice	N.I.	Co. Down
1957	6	1	5	7.6	10.9	10.9
1958	9	7	2	9.7	10.8	10.9
1959	5	3	2	4.9	10.9	11.1
1960	4	2	2	3.6	10.8	11.1
1961	9	7	2	8.1	11.3	11.4
1962	10	4	6	8.7	10.6	10.7
1963	8	5	3	6.7	11.0	10.8
1964	13	5	8	10.8	10.5	10.4
1965	11	5	6	8.8	10.6	10.7
1966	16	8	8	12.6	11.1	11.1
1967	8	3	5	6.1	9.8	9.6
1968	12	7	5	8.8	10.6	10.6
1969	13	8	5	9.1	10.8	10.8
1970	9	2	7	6.1	10.9	11.1
1971	11	8	3	7.4	10.6	10.8
1972	18	11	7	12.1	11.0	11.1
1973	15	8	7	9.7	11.4	11.2
1974	10	6	4	6.3	11.2	N/A
1975	17	11	6	10.7	10.7	N/A
1976	12	6	6	7.4	11.1	N/A
1977	16	7	9	9.9	11.0	N/A
1978	13	5	8	7.9	10.8	N/A
	245	129	116	8.3	10.8	

Table III shows the ages attained in my practice in South Down which go to make up the averages. As you can see infants are included, thus pulling down the average age of death. No figures are available for the average age at death in the United Kingdom.

TABLE III

Age at Death in Practice

Year	Age of Patient	Average Age	
1957	M. 46.	46.0	72.8
	F. 91, 87, 78, 73, 62.	78.2	
1958	M. 86, 80, 74, 69, 55, 46, 3.	59.0	61.0
	F. 82, 54,	68.0	
1959	M. 78, 67, 55.	66.6	69.0
	F. 74, 71.	72.5	
1960	M. 83, 8.	45.5	61.8
	F. 83, 73.	78.0	
1961	M. 85, 78, 73, 72, 41, 13, 2.	52.0	58.0
	F. 84, 74.	79.0	
1962	M. 83, 74, 73, 51.	70.2	53.7
	F. 84, 66, 66, 36, 3, 1.	42.7	
1963	M. 86, 70, 56, 55, 53.	64.0	67.8
	F. 80, 71, 71.	74.0	
1964	M. 73, 72, 69, 53, 30.	59.4	66.5
	F. 88, 83, 80, 79, 78, 68, 61, 30.	70.9	
1965	M. 88, 81, 63, 60, 55.	69.4	77.1
	F. 93, 90, 89, 86- 80, 63.	83.5	
1966	M. 86, 80, 77, 70, 66, 63, 54, 1.	62.1	71.9
	F. 94, 87, 87, 84, 82, 79, 73, 68.	81.8	
1967	M. 93, 69, 1.	54.3	60.6
	F. 86, 84, 78, 73, 1.	62.4	
1968	M. 83, 80, 79, 76, 62, 44, 37.	65.8	68.6
	F. 92, 74, 74, 72, 51.	72.6	
1969	M. 79, 76, 72, 72, 66, 65, 56, 1.	60.9	63.1
	F. 94, 85, 84, 69, 1.	66.6	
1970	M. 82, 70.	76.0	63.4
	F. 93, 81, 81, 78, 53, 32, 1.	59.9	
1971	M. 87, 75, 70, 70, 66, 55, 44, 10.	59.6	57.0
	F. 89, 60, 1.	50.0	
1972	M. 88, 80, 78, 76, 73, 68, 68, 46, 34, 2.	61.7	67.1
	F. 88, 82, 79, 78, 75, 65, 62.	75.6	
1973	M. 84, 81, 72, 70, 65, 64, 60, 53.	68.6	65.6
	F. 78, 75, 74, 71, 68, 68, 1.	62.1	
1974	M. 85, 80, 78, 70, 67, 53.	72.1	69.6
	F. 95, 91, 76, 1.	65.7	
1975	M. 87, 87, 84, 82, 75, 74, 69, 63, 62, 56, 45.	70.7	70.7
	F. 89, 87, 78, 69, 64, 37.	70.6	
1976	M. 81, 77, 70, 66, 57, 56.	67.8	72.6
	F. 85, 82, 81, 81, 76, 59.	77.3	
1977	M. 92, 84, 76, 56, 51, 49, 38.	63.7	69.5
	F. 96, 88, 82, 78, 74, 71, 67, 64, 46.	74.0	
1978	M. 88, 78, 71, 66, 64.	73.4	74.8
	F. 96, 85, 80, 79, 75. 72, 60, 58.	75.6	

Place of Death

About half of the patients died at home and half in hospital. The figures were 121 and 116 and another 8 died elsewhere. These included one who was drowned in the River Lagan, one collapsed and died while driving to work, one collapsed

TABLE IV

Causes of Death

Cardiovascular Disease	
Coronary occlusion	44
Cerebrovascular accident	31
Cerebrovascular disease	13
Congestive heart failure	11
Left ventricular failure	8
Pulmonary embolism	6
Valvular disease of heart	4
Ruptured aneurysm	3
Arterial disease	2
Congenital heart disease	1
Fibroelastosis of ventricle	1
Malignant hypertension	1
Myocardial degeneration	1
	126

Average age at death = 70.6 years

Malignant Disease	
Carcinoma stomach	7
Carcinoma lung	6
Carcinoma prostate	4
Carcinoma breast	3
Carcinoma gut	3
Carcinoma ovary	3
Cerebral tumour	2
Leukaemia	2
Mouth and ENT	2
Mediastinal tumour	1
Melanoma	1
Carcinoma oesophagus	1
Carcinoma pancreas	1
Retroperitoneal sarcoma	1
	37

Average age at death = 60.8 years

Other Causes	
Bronchopneumonia	16
Miscellaneous	14*
Renal Failure	10
CNS disease	6
Chronic bronchitis	6
Fractured femur	6
Pneumonia	6
Virus pneumonia	4
Hepatic cirrhosis	3
Spina bifida	3
Bronchiectasis	2
Intestinal obstruction	2
Road Traffic accidents	2
Blood dyscrasia	2
	82

Average age at death = 64.0 years

***Miscellaneous**	
Acute adrenal insufficiency	1
Acute tracheobronchitis	1
Asthma	1
Cot death	1
Diverticulitis — haemorrhage	1
Drowning	1
Gastroenteritis	1
Gastrointestinal haemorrhage	1
Meningococcal septicaemia	1
Pulmonary tuberculosis	1
Q Fever	1
Scalding	1
Splenic anaemia	1
Suicide	1
	14

in the street from aortic stenosis, one collapsed during physical training, two died in cars on the way to hospital and two were killed in road traffic accidents.

Causes of Death

When I came to study the causes of death of my patients I soon realised that they could be conveniently divided into three main groups —

Cardiovascular Disease	—	126 (51.4 per cent)
Malignant Disease	—	37 (15.1 per cent)
Other Causes	—	82 (33.5 per cent)
		245

I was surprised to find that the first two together caused two-thirds of the deaths and if the whole problem of malignant disease had been conquered only 15 per cent of my patients would have been saved. The causes of death are studied in more detail in Table IV. It is interesting that there were more deaths from coronary occlusion than from all forms of malignant disease put together. For me the most significant figure in the whole list is the single death from pulmonary tuberculosis – dramatically different from what would have been recorded thirty years ago. With many patients there were contributory factors bringing about their demise, but in each case I have tried to select the main cause.

Enough of these statistics lest we acquire the "Paralysis of Analysis".

VARIOUS ASPECTS OF PRACTICE

Appointments

I do not run an appointment system for three main reasons. First, I know that I would be unable to keep up to time, and if I did not do so, I could hardly expect the patients to be punctual.

Second, I like to think that any of my patients can see me within an hour or two of taking the notion to do so. I have always been afraid of someone who has had difficulty in screwing up their courage to consult me for, say, a lump in the breast, being put off by having to make an appointment.

Thirdly, I can spend as long as I think necessary with each patient for I know that those in the waiting-room must have a complaint that they consider of sufficient gravity as to be worth the wait. When a patient is consulting me my thoughts are concentrated on trying to identify the problem and to solve it; I am able to forget about how many are in the waiting-room. It used to be said that one should treat each patient as though he was one's only patient, and I think this is sound advice; if the patient's problem isn't solved on the spot, he will be back to trouble one in the future. Once the diagnosis has been made, follow-up need only take a couple of minutes.

Certificates

The issue of certificates forms a significant and irksome proportion of the work in general practice. Some certificates are "official," such as those for sickness and accident benefit, expected confinement and death, the issue of which is obligatory, while others are "private" and may qualify for a fee.

Private certificates are given to satisfy employers for absence from work, school authorities for absence from school or unfitness for games, insurance companies for sickness and accident, and the housing executive for points in securing the tenancy of a house.

An unusual request for a private certificate was made to me a few years ago when a young lady came to see me privately and asked me to examine her and give her a certificate to say that she was a virgin. I asked who required the certificate and she replied that her boy-friend did. I asked her why he wanted it and she told me that he had said that she wasn't a virgin. I asked her what made him think so. She said that he had been "fiddling around" the previous night and found that she wasn't. I asked her where he had obtained his experience but she did not know. I told her to tell her boy-friend to accept her as she was or else to change her boy-friend. I then asked her for two guineas. She said "What for – you didn't examine me ! " I told her it was for the advice and that it was cheap at the price. When I bumped into her about a year later she told me that she had changed her boy-friend shortly after being with me. Advice that is paid for may sometimes be followed.

Chemists

There are two chemists in Rathfriland and one in Hilltown, which is three miles away. They are exemplary men, willing to oblige me or my patients at all hours of the day or night. I regard them as – dare I use the word? – indispensible! Pharmaceutical chemists play a very important, if unobtrusive, part in the Health Service and richly deserve the support of the medical profession. They often find it difficult to obtain locums and may go for long periods without a vacation. It is usually when one of them retires or gives up his shop that his true value to the local community is realised.

I hope that their profession may become sufficiently attractive to recruit eager young men and women into it.

The Clinical Record

The present clinical record is a cardboard envelope, 7 inches tall and 5 inches wide and has been in use since 1920. The back of the envelope is ruled for notes while the front bears the fundamental details of the patient, with a discreetly narrow space at the bottom for the date and cause of death, reminding us of our mortality.

The envelope is easily stored and handled and can hold continuation cards for notes and the correspondence relating to the patient. Hospital stationery used to measure about 8 inches by 6 inches and, with a single fold, could be fitted into the clinical record with ease. Now it comes in all shapes and sizes and some quite small sheets, because of their square shape, have to be folded in four in order to be stowed, causing the record to bulge in the middle and perhaps split at the sides. Envelopes with gusseted sides have been introduced, but even these can be stretched beyond their capacity by patients with a penchant for ill-health.

Moves are afoot to replace these envelopes with folders but problems of cost, storage, and the labour of transferring information from one system to the other have been encountered, and I, for one, hope to have left practice before they are introduced.

Disease Patterns

The pattern of disease in my area has changed considerably over the past thirty years. Generally speaking, apart from tonsillitis and urinary tract infections, bacterial diseases have tended to disappear, while viral diseases, with the exception of poliomyelitis, have continued unabated. Acute abdominal emergencies also seem to be less common. Rheumatic fever, erythema nodosum, and nephritis which used to follow streptococcal infections are now seldom seen, and I have never seen a case of *acute* mastoiditis. Diphtheria, I am glad to say, had almost disappeared before I came on the scene, and I have only encountered four cases in my life. Nevertheless, I always remember Dr. Freddie Kane's dictum "The examination of a sick child is not complete until its throat has been seen" – not always an easy task ! Meningococcal infections seem rare in rural areas but I did have one case which was rapidly fatal, while leptospiral jaundice seems to have disappeared from our area. Chickenpox, glandular fever, measles, mumps and rubella continue much as before, while sporadic cases of influenza occur throughout the year. The biggest change in the incidence of serious infectious disease has been the conquest of tuberculosis and poliomyelitis. We must, however, remember the analogy that the "price of peace is eternal vigilence".

As old diseases disappear, new ones are bound to spring up, such as the illness that afflicted the man who ate the steak that came from the steer that nibbled the grass that grew in the field where roamed the cat that caught the bird that ate the fish that fed on the bug that floated around in the oil slick !

Personal Behaviour

To enable me to extract the maximum from myself I have adopted a code of behaviour, which, like Common Law, though not written down, I observe as rigidly as if it were. I have mentioned some features of it earlier on, such as never seeing a patient without having his clinical record in my hand, treating every patient as if he was my only patient, and trying to solve each problem as it arises.

I try to attend to a request for a visit out of hours as soon as the message comes in, otherwise it tends to rankle with me. I keep the telephone in the bedroom some distance from the bed so that I have to get up to answer it — as

soon as my feet touch the floor I am immediately awake. When I am absolutely exhausted and am asked to see yet another patient, I steel myself for the effort by telling myself that this is the most important case I have seen all day, for I am always afraid of missing something serious when I am tired; general practice is not a difficult subject but it does involve keeping on keeping on. The late Dr. J. C. Smyth, who was both a dentist and a doctor, once told me that he had been taught always to wash his hands in front of the patient, even if he had just washed them and I try to follow this as far as possible.

There is an old saying "Never make friends of your patients and never make patients of your friends." I have broken the first rule many times but I make every effort to observe the second rigidly. So far I have not regretted making friends of my patients and indeed they have become almost members of my family, —perhaps that is what is meant by the term "Family Doctor'. I dont know if such relationships can be established in multi-doctor practices or even if they are desirable, but for me they provide a continuing interest.

In times of stress I unashamedly admit that I call upon my Maker for assistance. This is not unknown in other spheres of activity. My son, when training as a pilot in the Royal Air Force, told me of one young flyer who, after beating up the airfield and narrowly missing an obstacle at the far end, was heard to say over the intercom "O.K. Jesus! — Have control now! "

Single-handed Practice

Much can be said in favour of practicing in partnerships, groups, and from health centres, but I have come to enjoy solo practice for the following reasons:

First, I don't have my sensitivities bruised by seeing a patient come into the surgery and then opt to consult a colleague – anyone who enters my premises has come to see me – if they hadn't, they would have gone elsewhere; the consultation therefore starts off on a basis of mutual trust as I know that I am not being seen under sufference.

Second, I can follow each patient's illness from the beginning to the end and make adjustments to the management as I go along; I can alter the diagnosis or treatment as I think fit without undermining the patient's confidence in an associate.

Third, I have to accept responsibility for my own actions and I do not have to 'carry the can' for anyone else.

Fourth, I can't complain about getting the heavy end of the stick; if there is any work not done in the practice. I have no one to blame but myself, and as I know that it will have to be done sometime, I try not to let things get behind.

Finally, solo practice prevents me from becoming too powerful – it is good for me to realise that a patient can transfer to another doctor if I don't give him satisfaction; I consider that allowing patients to "vote with their feet" is preferable to having them report one to the Central Services Agency or sueing for negligence.

Varied Roles

Along with his clinical work, a general practitioner has many roles thrust upon him, many of them time-consuming. The appointment of a state pathologist in 1958 and the development of his department has lightened the load of the medico-legal work and has abolished the farce of the coroner's inquest, where I was sometimes asked to pronounce on the cause of death from a view of the deceased's face.

Solacing unmarried mothers-to-be and listing their options remains a fairly frequent task in spite of the prevalence of "The Pill". Twenty-five years ago it was not uncommon to be summoned by parents to young girls with supposed appendicitis and have to modify the diagnosis to that of imminent parturition, the arrival of the infant confirming my opinion.

Reconciling estranged marital partners is also a lengthy undertaking and, for me, there is no licence fee for 're-marrying' them, but I suppose a feeling of satisfaction is sufficient reward.

Comforting the dying, usually from cancer, when the mind is clear and the body frail, can be rather depressing, especially when philosophical subjects such as the "Meaning of Life" and the question of "Life after death" crop up, but sometimes the conversations can be enlightening or even amusing.
Harry B. had suffered severe pain in the back from secondary carcinomatous deposits from the pancreas for a year and a half; it was six months after the onset that he became jaundiced and the site of the primary was recognised. Joining the gall-bladder to the duodenum, thus by-passing the growth, relieved the jaundice, but the backache continued with increasing ferocity. Towards the end, I asked him if he regretted his many months of agony. After a pause, he replied that he didn't; he said that although he hadn't been a bad man, he hadn't been a good one either, and the past few months had allowed him to set things right with his Maker before he made the final transition. The pain was so severe that he longed to die and one morning he told me that he had had a strange dream. He dreamt that he was in a field with a stream at the bottom of it and across the stream, in another field, he saw Jesus standing – "It was the beautifullest place I have ever seen – There is just nothing like it on this Earth ! I said 'I'm coming, Jesus! ' and He said 'Not yet, Harry, not yet." Was this a drug-induced hallucination or a glimpse of the 'Life Beyond' ?

In either case, it brought him great peace and, a few days later, on the morning of his death, he woke at 6 a.m., settled his remaining debts by cheque, and died quietly at 8 a.m.

Wives in General Practice

Wives are virtually essential and, doubtless, essentially virtuous, in general practice. They receive and record messages during the day when the practice staff are off duty or are otherwise unavailable, and during the night when the doctor is out on a call. They offer hope, reassure, and bring words of comfort to those who seek the doctor when he can not be found. They feed, clothe and support the doc-

tor in his times of stress and receive much of the irritation which he would have liked to have vented on the real culprit for his ill-humour. I therefore pay tribute to all those wives who have done so much for medicine throughout the province whose faithful service is seldom recognised, and I offer a special word of thanks to my own wife for her tolerance, patience and unfailing support.

CONCLUSION

In conclusion, I would like to thank you all for enduring me so patiently. If this address has seemed long and tedious, then I have been successful in creating the atmosphere of an average day in general practice; I have not mentioned obstetrics, as this generally occurs at night and I have no wish to weary you any further. I realise that the address has been a sequence of inconsequentialities, but so is general practice, for it is the acne, bronchitis, colic, dandruff, eczema, flu, gastro-enteritis, headache, impetigo, jaundice, kerion, light-headedness, mental depression, nervousness, obesity, pyelitis, quinsy, rheumatism, sinusitis, tonsillitis, ulcers, verrucae, whitlows, and the XYZ of trivia which form the bulk of a general practitioner's work and it is only occasionally that one sees an interesting case, usually of serious import for the patient.

I feel that successful medicine will always depend on a satisfactory doctor/patient relationship however sophisticated our methods of diagnosis, treatment, and organisation become, and since a man is greater than the sum of his parts, I hope there will always be doctors who will look after the patient as a whole.

As I said at the beginning, I never intended to do general practice but, looking back over the years, I am convinced that there is no other field of human endeavour in which one can offer so much help, physically, mentally and, perhaps, Spiritually, on an intimate basis to so many people.

After this sanctimonious statement, I would like to end on a serious note: —

Twenty-four hours a day they seek
His help on seven days a week.
He rushes at the 'phone's shrill peal
Out of his bath or from his meal.
They button-hole him in the street;
They drag him from his theatre seat.
He settles to a game of bridge
And someone has a haemorrhage.
And when, at last, his race is run,
When his last journey has begun,
They'll come and say in accents terse
"Is there a doctor in the hearse?"

THE MAKING OF A DOCTOR
Reflections on Attitudes, Ability and Aims in Medicine

by

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

THE ADDRESS TO THE STUDENTS AT THE OPENING
OF THE WINTER SESSION ROYAL VICTORIA HOSPITAL,
4th OCTOBER, 1979.

IT has long been the tradition of this hospital for a member of the medical staff, appointed to the duty by his colleagues, to deliver an address to the students at the commencement of the winter teaching session. Indeed, it was already an old-established custom in 1852 when Dr. Andrew Malcolm graced the office of orator.[1] I feel greatly honoured to have been entrusted with this very special responsibility and to tread in the steps of those who, over the years, have made the Royal Victoria Hospital what it is today.

In 1903, Sir William Osler,[2] distinguished physician and teacher, celebrated essayist and acknowledged master of the orator's art, addressing undergraduates of the University of Toronto said: "Of the value of an introductory lecture I am not altogether certain. I do not remember to have derived any enduring benefit from the many that I have been called upon to hear or from the not a few that I have inflicted in my day. On the whole, I am in favour of abolishing the old custom . . . " If that was how Sir William truly felt about an occasion such as this, who am I to disagree with him, if only for today! And yet, I wish that he had had the privilege of being a member of the medical staff of the Royal Victoria Hospital and of sharing our traditions because I am sure he would have found inspiration in the wisdom and oratory of his colleagues. They would have included the late Dr. R. S. Allison's "Olympians,"[3] Sir William Whitla, Professor J. A. Lindsay, Dr. William Calwell, Dr. H. L. McKisack, Mr. A. B. Mitchell, Dr. W. B. McQuitty, Mr. Robert Campbell and Dr. John Walton Browne who, as chairman of staff, participated in the Loyal Address of Welcome to their Majesties King Edward VII and Queen Alexandra at the official opening of the Royal Victoria Hospital on 27th July of that same year, 1903.[4]

It is on these occasions that we are especially conscious of our links with the past, with the long line of our illustrious predecessors who practised and taught in this hospital and in its forerunners, the Belfast Dispensary and Fever Hospital, first opened in Factory Row in 1797 and later moved to West Street, Smithfield, and then the Belfast General Hospital built in Frederick Street, opened in 1817 and renamed the Belfast Royal Hospital in 1875. They devoted their work, wisdom and skill to the service of their fellow men and were diligent and faithful trustees of that great heritage which we are proud to cherish today. It reminds us that we, being many, are all members of one body.

I wish to take this opportunity to express sincere personal appreciation and thanks for wise counsel and valued help to colleagues and friends who have now fulfilled their appointments at this hospital and whose daily leadership, companionship and support we shall all greatly miss.

It is my privilege this morning, on behalf of the medical staff of the Royal Victoria Hospital, to extend a warm and friendly welcome to the whole student body and especially to those who have most recently been admitted to the practice of this hospital. During the next three years you will spend many hours within its walls and it is my hope that, as you gradually become familiar with its wards and corridors, clinical rooms and lecture theatres, outpatient departments and operating suites, and begin to recognise more of the faces of the hospital community of some six thousand people who spend their working lives on this campus, you will feel great affection for and loyalty to this institution, standing as it does for the highest ideals of our deeply troubled and careworn human society. At first it may seem a very large and even rather daunting place, its never-ceasing activity taking no account of the passing hours, but as you absorb its atmosphere and get to know its sights and sounds I hope that you will feel humble pride in belonging to this hospital, to this medical school and to our profession, all of which have for their ultimate purpose the protection of health and the immediate provision of skilled treatment and compassionate help for those whose lives are impaired or endangered by illness or injury.

This morning we celebrate your coming, for in this annual renewal of our profession by gifted young people with keen minds, warm hearts and a fresh outlook lies the promise for the future. We are very conscious of our duty to you who look to us for inspiration, instruction and guidance and who, in a few short years, must be ready and willing to accept the weight of our responsibility. As Cassell[5] put it: "One of the most wonderful things about medicine is its continuity. Doctors are trained by other doctors. Each physician, then, is not only himself but is made up of other men, and each teacher becomes a part of his students.' Our thoughts, hopes and good wishes will go with you in your undergraduate and postgraduate career.

Over the past three decades medicine has undergone more profound and rapid changes than at any time in its history. In the United Kingdom, the most important of these was the introduction of the National Health Service on 5th July, 1948, recently described by Sir Francis Avery Jones[6] as "potentially . . . one of the finest advances in social humanity in this century." Its reorganisation in 1973, however, led to the erection of a top-heavy administrative structure that almost wrecked communication between doctors and administrators and initially slowed progress. Changes of attitude have occurred within our own profession as a reaction to the unremitting burden of clinical responsibility, inadequate staffing, long hours and successive pay policies. Still fresh in our memories are the unprecedented events of last winter when the country witnessed the effects, and noted the implications for the future, of the growth of industrial-style disruption of hospital services by trade-unionists representing the interests of low paid health service workers and demanding a voice in management decisions. Many changes have sprung from the clinical application of major scientific discoveries and sophisticated technological advances that have brought great benefit to the patient. Yet others have arisen in response to the growing hopes and expectations of society.

Within the span of my professional lifetime, medicine has experienced a peaceful revolution of major proportions and there is as yet no indication that the pace of change is slowing. On the contrary, to give but one simple example, such is the flood of new information flowing in from every quarter that the pool of knowledge has widened into a veritable sea and every doctor and every student is faced with the problem of how to manage this embarrassment of riches.

It therefore seems appropriate to pause in the midst of these changing times to consider those personal attitudes, academic standards and clinical principles that are likely to be important in determining the kind of medicine that you, our heirs and eventual successors, will practise in years to come and how we as a profession can best use our influence to safeguard its character and quality. The outcome of these deliberations is far from academic for those of us who today are seated in the front stalls of this house for, as increasingly likely clients, we have a strong personal interest in any service to be provided by those at present occupying the gods but who will surprisingly quickly find themselves sitting nearer and nearer to the front! It is to you that I wish largly to direct my thoughts this morning and in so doing I would respectfully ask for the goodwill and forbearance of my senior colleagues.

The future of our profession depends primarily on the quality of its members. This is determined by the careful selection, from large numbers of well-qualified applicants, of those to be admitted to medical school, their successful completion of a long and exacting course of undergraduate training involving studies and examinations in more than twenty subjects to provide a broad basic medical education, and the attainment of a satisfactory standard of performance in pre-registration and post-registration hospital appointments designed to ensure competence in general or specialist fields.

In a thoughtful and timely commentary on the contemporary scene, Horrobin[7] drew attention to "one of the illusions of both laymen and doctors that individuals are admitted to the medical profession at the time they receive their . . . degree . . . . The nature of the course followed and the examinations set are supposed to determine whether people will become doctors or not. This is an illusion because in most countries the failure rates of students going through medical school are now extremely low. For the most part, people are selected to become doctors at the time they enter medical school."

What is it then that determines what kind of doctor a person becomes? Horrobin considers that only two factors are important. The first is the kind of person who enters medical school, since intelligence and personality traits are little altered by education after the age of 20. The second is whether the philosophy of the medical school emphasises learning or teaching as the key educational process.

THE SELECTION OF MEDICAL STUDENTS

Today as never before in Britain young men and women prefer the career of medicine to all others.[8] What hopes and dreams are reflected in this choice! In answer to a recent questionnaire prepared for a conference arranged by the Gen-

eral Medical Council to discuss the selection of medical students,[9] those applying for places in medical school most often gave as their principal reason for choosing a career in medicine a wish to provide help and advice to those in physical and mental distress. Next in order came intellectual curiosity about the physiology of man, closely followed by the opportunity it offers of engaging in useful medical research. They did not overlook the fact that medicine is a secure profession and carries a good salary but few admitted being influenced by its good social standing. It is of interest that more than one-third of the applicants had already decided on medicine as a career before they entered their 'teens and for four out of five it was their established aim by the age of 15, younger than most other professions.

Analysis of "A" level academic standards and social class distribution of final year medical students in Northern Ireland[10] throws light on some of the reasons for their career decisions. Of those responding to a survey carried out by the Northern Ireland Council for Postgraduate Medical Education, 5.8 per cent had obtained four or more A grades at "A" level, 15.2 per cent had three A's, 15.2 per cent had two A's, and 29 per cent had one A (together with other grades), while 34.8 per cent had at least three B's. These grades represent a very high overall academic standard indeed. The survey also showed that 66 per cent of these final year students belonged to social classes I and II compared with an expected 22.8 per cent, while over 15 per cent had one or more medical parent. Children of professional parents were thought to have advantages in academic ability, educational opportunities and financial backing that helped to equip them for entry into medical school.

It has been widely held that academic merit is the principal criterion for the selection of medical students and in numerous medical schools throughout the world, including Queen's, the selection procedure has been so refined as to result in the admission of the good basic science student who will survive the difficult biological science curriculum.[11] It does not take special account of the individual's ability to relate to people; it merely satisfies the educational requirements of the medical school.

Many have expressed dissatisfaction with the methods of selection usually employed, favouring as they do the crammer and the student with a good memory as well as the truly intelligent. In any case, there is no assurance that a bright or even a brilliant student will be a good doctor. This emphasis on academic performance results in the evaluation of only a narrow range of attributes and in the neglect of many other qualities that are desirable in medical students and doctors. "Should academic merit be the sole basis for selection to a profession which demands this and so much more besides?" asked Thompson.[12] "Are we to take no heed of integrity, resolution, personality and character in the broadest sense . .?"

Interview has long been the traditional method of assessing personality, motivation and bearing. In 22 of the 31 medical schools in the United Kingdom, including all 12 of the University of London medical schools and 10 of the 12 English provincial schools, interview is an established part of the selection procedure and is accorded special importance in some.[13] On the other hand, accept-

ance of applicants for places in the Belfast, Welsh and five Scottish medical schools, is usually based entirely on their academic qualifications and headmasters' confidential report.

Motivation is acknowledged to be a major determinant of medical school performance and its assessment is therefore one of the principal aims of an interviewing panel. It is, of course, recognised that some applicants may prepare for the interview by working out in advance the "right" answers to the relevant questions. The exclusion of obviously unsuitable candidates is another of the functions of the interviewing panel and where interviews are not held, much depends upon the frankness, accuracy and relevance of headmasters' confidential reports on the attitude, ability and character of the applicants. On the other hand, some consider that, as a method of forecasting future performance, interview has less validity than academic qualifications because those involved tend to favour candidates who are articulate and pleasing in appearance though these are not among the principal qualities that will determine their effectiveness as doctors.[14]

By far the most comprehensive and exhaustive selection procedure is that devised by McMaster University Medical School in Hamilton, Ontario, which opened for students in 1969.[15] Qualities being sought include academic competence and the capacity for self-directed learning, self-assessment and problem-solving required by the McMaster system of learning. The aim is to enroll a class of students with very varied educational standards, social background and life experience because such variety is considered to be of benefit in meeting the medical school's objectives and also in enriching the contribution that class members make to each other's education.

Selection is based on information provided by an autobiographical sketch and a personal letter stating the applicant's aims and motives in life, his academic qualifications, three confidential references, a 45-minute interview and, finally, his performance in a simulated group tutorial with other applicants. In this, he is observed from behind a one-way window by a three-person team comprising a member of the university faculty of medicine, a medical student and a nominated member of the public! As a result of the efforts of hundreds of interviewers and assessors, who in 1976, gave more than seven thousand hours of their time, out of a total of 1,897 applicants 100 were eventually accepted for admission to the medical school. Important members of the university academic staff are convinced of the effectiveness of these laborious and lengthy selection procedures but others have reservations about whether they achieve their aims.[16] There is as yet no clear evidence that the students so selected and trained make better doctors than those from other medical schools but no final judgement will be possible for a number of years. One can only feel profoundly thankful that mercifully, so far, we have all been spared such an ordeal!

Inevitably the talents and personalities of each new intake of medical students ultimately influence the numbers of doctors in different specialities, their distribution in industrial, suburban and rural areas and their views of what patients need and should expect from a doctor. Several studies in America have shown that applicants of exceptionally high academic standard tend to prefer positions

in teaching and research, and to seek posts in large centres with excellent laboratory and library facilities. In one study, doctors with a strong preference for scientific subjects and a highly rated performance in premedical courses in science tended to be over-represented in pathology, anaesthetics and surgery and under represented in internal medicine, paediatrics and psychiatry.[17] Despite their undoubted intelligence they were unwise enough to allow themselves to be judged by a panel of psychologists who came to the conclusion that they were lacking in sensitivity to others, in breadth of interest, originality and social presence and were rather inclined to be rigid!

Too often it is assumed that there is only one model of the good student or the good doctor, for medicine now offers such a remarkable range of occupations, some involving constant contact with patients while others are completely divorced from the clinical scene. The methods of selection should therefore provide a variety of talents and personalities that together include all the kinds of excellence that medicine encompasses. Some, but not all, members of each incoming year should be of the highest academic standard, some should be scientifically orientated, some should manifest the good character and social presence that most interviewers favour and many should be deeply responsive to humanitarian issues. It is fortunate that there are so many gifted young people who wish to make a career in medicine and it rests with the university faculties of medicine to ensure that they also possess those qualities of sympathy and understanding that are needed to preserve the humanitarian aims and essential caring role of our profession. Bernard Shaw said: "Unless a man is led to medicine or surgery through a very exceptional technical aptitude, or because doctoring is a family tradition, or because he regards it, unintelligently, as a lucrative and gentlemanly profession, his motives in choosing the career of a healer are clearly generous."

UNDERGRADUATE MEDICAL EDUCATION

There must be many here this morning who still remember the enormous feeling of relief that the news of acceptance by the Faculty of Medicine brought, not only to ourselves but also to our long-suffering parents, and the sense of excitment, anticipation and slight apprehension as we started out on one of life's great personal adventures. Such emotions are only to be expected when it is remembered at what age the decision to become a doctor is made and how intense the competition for places in medical school. In addition to their early commitment to medicine, future medical students have a distinctive blend of ability and attitude, a combination of scientific interest, academic achievement and concern for other people.

How important it is then to harness this energy and enthusiasm at the beginning of the student's professional training and to avoid undue delay in introducing him to the clinical scene. This has been found to stimulate interest in and give perspective to his studies in the biological sciences which are otherwise liable soon to be forgotten! The importance of this clinical experience was recognised at

Newcastle, and subsequently the University of Southampton introduced a new five-year curriculum which, in acknowledgement of an almost universal wish on the part of students, includes such early patient contact. This helps them to acquire skills in communicating with a wide range of people and, as a result, they have much more confidence when they begin formal bedside instruction.

In his recent book, "Quest for Excellence in Medical Education" Sir George Pickering[8] said: "Undergraduate education should have as its principal aim the training of the student's mind so that he knows how to learn, that he has acquired the basic discipline of scholarship and the habit of self-education." If all day, every day, students are fed ephemeral facts instead of being helped, while at medical school, to prepare for a lifetime of study, of learning by their own efforts, they are likely to become doctors whose education has resulted in the atrophy of the only characteristic which would have enabled them to remain competent throughout their professional lifetime, their ability to learn for themselves."

Dr. Sydney Burwell, one-time Dean of Harvard, must have caused quite a stir when he told his pupils: "In ten years time you will discover that half of what you were taught has proved to be wrong, and neither I nor any of your teachers knows which half."

Dr. Andrew Malcolm,[18] beloved physician, memorable clinical teacher, enthusiast in pathology, accomplished historian and tireless philanthropist, emphasised the crucial importance of the active role of learning when, almost 130 years ago, he whote: "The pupil must be regularly taught to examine and distinguish disease for himself . . . . after the most elaborate teaching which the systematic schools and colleges can supply, the student must, at last, sit down at the bedside of disease, and, in all humility, inquire of nature herself as to her secret workings . . . . and frequently he will experience the sad truth that man is often fonder of proving his own fancies than humbly recording the simple answers of nature – the touchstone of truth. And further, when we reflect what may be the amount of happiness or misery which may flow from a right or a wrong interpretation of her physical works . . . . , the importance of extreme care, vigilance and perserverance in the teaching of her ways . . . . cannot be too strongly enforced." This deep concern about needless errors in diagnosis caused by lack of proper care in clinical examination and by the irresponsible pursuit of unsubstantiated theories is a mark of Malcom's clinical integrity and professional authority.

Like the artist, the writer and the musician, you, the doctors of tomorrow, must learn and become skilled in using the techniques of our profession. By far the most important of these is the ability to communicate, often at a deep and personal level, with complete strangers whose care becomes your responsibility.

At first it may be difficult for you, as healthy young people only a year or two away from the scenes of your schooldays, to come to terms with this enclosed community set aside from the busy world and to relate to its unfortunate members, the range and variety of whose symptoms may leave you bemused and dismayed. Be not disheartened. The hours that you spend at the bedside and in the outpatient clinic will be by far the most important and rewarding of your under-

graduate career. By showing to the patients friendly interest and concern you will gain their confidence and also your own, and will thus establish with them a professional relationship. As you gradually learn the vocabulary and become increasingly fluent in the special language of clinical medicine, phrasing your inquiries to suit people of all ages and from every walk of life you will begin to sense in their replies something of the uniqueness of the individual and of his reaction to his illness. As important as the words that are used are the gestures which accompany them and which sometimes convey meanings for which mere words seem quite inadequate. You must learn to observe the whole man, his movements, his attitude and his bearing, for therein may be discerned mute reactions to life's difficulties and disasters.

Often a diagnosis can be established from the history alone and the careful physical examination which should invariably follow may be entirely normal. One is then very conscious of how imprecise are the techinques of examination and this is nowhere more evident than when the clinical findings are compared with those dispassionately displayed by the pathologist. I would therefore urge you to take every opportunity of making such a comparison in order to improve your examination technique and your interpretation of the clinical data.

You will soon begin to realise that some of the outpatients and many of those admitted to the wards are not newly ill and that the diseases that led them to seek help from their doctor have long been present. Indeed the great majority of "emergency medical admissions" are the result of the sudden breaching of a clinical threshold in the course of a longstanding, often progressive disease. In some patients the acute illness follows a period of ill health but in others the sudden change from a symptomless to an acutely symptomatic state belies the true chronicity of the underlying disease. And yet it is at this stage of the disorder that sophisticated and expensive diagnostic and therapeutic techniques are likely to be brought into use, when the prospects for successful intervention are far less encouraging than they might earlier have been.

When by Grace, effective treatment and good nursing the patient recovers and the illness is at an end, we must remember that, despite the transformation of the clinical state, the underlying disease often persists. There is, in effect, a critical distinction to be drawn between illness and disease and, in the present state of knowledge in medicine, it is important to recognise that the care and treatment of the former and the cure of the latter may be quite different concepts. How fortunate we are that our great Designer foresaw the inevitability of fair wear and tear and thoughtfully incorporated in every system sufficient spare capacity to provide us with a generous margin of safety!

The range of illness seen in hospital is a very important but inevitably limited and unrepresentative part of the whole spectrum of ill health to be found in the community. It is therefore essential for today's student to have the opportunity of broadening his experience through domiciliary practice so that as tomorrow's doctor he will be alive to the tremendous challenge and the many opportunities presented by this major branch of medicine. It is likely that at least half of our young colleagues will become general practitioners and join the ranks of those

who cope with the 90 per cent of medicine that occurs outside hospital. The family doctor, working under the relentless tyranny of time's fleeting minutes, is almost invariably the first to be faced with life's many problems and the responsibilities that he carries must often seem unlimited. At one moment he is required to respond sensibly, effectively and without hesitation to some unforseen emergency and at the next he must endeavour to detect and recognise the earliest clues of disease, reacting with discrimination to the countless early-warning signals of physical or mental strain. He must distinguish the medical from the social, the somatic from the psychiatric and the important from the trivial so that he may advise and guide, reassure and comfort and, where possible, institute effective treatment. In trying to meet his responsibilities, however, he does not often have such ready access to diagnostic aids that are available to hospital medical staff.

The general practitioner, because of his close relationship with his patients and his knowledge of family circumstances, is in a strong position to perceive the ill-effects of an unhealthy life-style and may be able to use his professional and personal authority to redress an unfavourable situation. At the present time, behavioural influences such as cigarette smoking, excessive drinking, overeating and sedentary habits are major causes of ill health in western society. As McKeown[19] has said: "Our habits commonly begin as pleasures of which we have no need and end as necessities in which we have no pleasure. Nevertheless we tend to resent the suggestion that anyone should try to change them, even on the disarming grounds that they do so for our own good."

The value to students of observing and participating in this kind of medicine must surely be crucial. In addition, they can practice their interviewing skills on patients who may still await a diagnosis and whose complaints retain their original description.

UNDERGRADUATES' CAREER PREFERENCES

In no other profession do graduates from the same vocational degree course enter occupations so diverse as, for example, general practice, surgery, pyschiatry and laboratory medicine in which the job content, the working environment and the personal attributes required of the practitioner vary so enormously. The student's ultimate choice of career is likely to be influenced by his attitude to patients, to solving problems and making decisions, to working as a member of a team and to such intrinsic differences between the specialties as the success rate in curing, the skills required, the scientific content, the opportunities for research and the personal, intellectual, financial and social satisfaction that each gives. In McKeown's view, however, "the really potent influence on students, and through them on the subsequent operation of the health services, is neither the selection procedure of medical schools nor the design of medical curricula; it is the image of medicine which emerges from the range of activities and interests

of the teaching centre . . . . Inevitably students acquire their concept of practice from the example provided by their teachers, and they leave the hospital aspiring to engage in the work they saw when training." It is therefore important that they have the opportunity of gaining experience of as many different aspects of medicine as possible.

In recent years the departure of a considerable number of doctors from the United Kingdom and serious staff shortages in such important specialities as laboratory medicine, radiology, geriatric medicine, anaesthetics and community medicine, have stimulated interest in the career preferences of undergraduates and graduates. In Northern Ireland, 56 per cent of all career posts are in general practice but the survey carried out in 1977 by the Northern Ireland Council for Postgraduate Medical Education and the Medical Faculty of Queen's University[20] showed that only 23.9 per cent of final year medical students gave this discipline their first preference compared with 53.6 per cent who chose a career in hospital clinical work. This discrepancy between the students' ambitions and potential openings in the National Health Service was the most striking fact to emerge from the survey, and it seems that career decisions in medicine, as in other walks of life, are not based primarily on such logical considerations as career prospects. However, in view of the prevailing financial climate and job situation in the Western World, our young colleagues will need common sense and wise guidance in choosing their life's work, but they may find comfort in Pickering's words: "Perhaps the outstanding feature of contemporary medical education in Britain is the high quality of its students . . . In every university, medicine is by far the most sought-after faculty . . . . In the past, the shortcomings of the average medical graduate could be attributed to low intellectual quality; today such faults as he has can be justly attributed mostly to his (medical) education." I must say that I think Horrobin went a good deal too far in pursuing this theme when he wrote: "There has been a dramatic change in the last 20 years. Before that, medical students were certainly not the brightest students: their stereotype was that of the cheerful games-playing oaf rather than the studious intellectual with straight A's"! ! Nevertheless, we who have been privileged to share in the education of generations of medical students and to observe their progress and maturation into competent young doctors, have never failed to be impressed by the transformation that invariably occurs in the first few weeks of their housemanship as they cheerfully and responsibly face up to the professional duties for which the long years of undergraduate training have prepared them. Then it matters little what they have been taught, only what they have learned.

THE FUTURE OF INTERNAL MEDICINE AND OF THE GENERAL PHYSICIAN

Over the past decade, physicians have felt concern for the future of internal medicine because of the changes that have occurred in the character of their work in the medical wards and outpatient clinics. These have been mainly due to two quite separate causes.

The first is the increase in the number of specialist physicians and in the size of their units. Many patients, whose disorder the general physician was trained and once considered competent to manage, are now referred directly to specialists who have access to large, well-equiped departments where excellent outpatient and inpatient investigation and treatment are provided. Such is the scientific complexity and technical sophistication of the work, that medical staff establishments at both senior and junior level are high, and advanced research in very specialised fields is an integral part of the activity of these departments.

The second major factor is the increasing age of the population and the consequent rise in the incidence of diseases of old age requiring treatment in hospital, and often resulting in substantial physical and mental disability and social incapacity. Because of a significant migration from Belfast of those in the socially supporting age group 40-64, serious inner city poverty and social deprivation, staff shortages in the community services and the failure of government to provide an adequate range of accommodation for the elderly, the medical wards have been transformed by the long-term occupation of many of their beds by frail and disabled elderly people. The consequence is not only the misuse of much-needed skilled and costly services: in addition, those who would greatly benefit from personal and nursing care in a less clinical and more tranquil environment must spend the last months or years of their lives in small crowded wards lacking in appropriate facilities where their needs inevitably compete with those of the newly admitted acutely ill, the majority of whom are also elderly. Surely those who experience the heartbreak of severe disablement and cannot go home deserve accommodation and supporting services suited to their personal, intellectual and clinical needs, while those who suffer serious illness, whatever their age, should have the assurance of prompt admission to acute medical units that are staffed and equipped to provide expert treatment and skilled nursing care. The general physician, who continues to be responsible for the reception and treatment of most emergency medical admissions, could then apply sensible clinical principles in the management of his unit.

Many senior registrars now find less to attract them to a career in internal medicine and prefer to train in one of the specialties in the expectation of greater intellectual stimulus and better opportunities for research while at the same time avoiding those difficulties faced by their medical colleagues.

The question then arises, does the general physician have a continuing role or should all future appointments be filled by specialists? The answer is of considerable importance because of the imminent retirement of large numbers of general physicians who took up their consultant appointments in the early post-war years and at present constitute the largest group of medical consultants in the hospital service. It does not seem practicable for every acute hospital to carry its own full complement of specialists and in many it is probable that medical emergency admission and outpatient referral services will be provided by physicians with broad clinical experience though others will undoubtedly have a specialty commitment. In some large teaching hospitals in the United Kingdom, specialist physicians routinely participate in general medical emergency reception but in others,

including the Royal Victoria Hospital, the medical take-in units mainly depend upon general physicians and it seems unlikely that specialist units could or would wish to take on the mountain of work arising from take-in.

I would like to pay tribute to the surgeons of the Royal corridor for the expert way in which they treat general surgical emergencies while at the same time providing for the whole of Ulster a specialty referral service that is not excelled anywhere in these islands.

The general physician has been trained to consider each patient's problems in depth and also to maintain broad interests and acquire wide experience in clinical medicine. He is therefore well-qualified to guide students who have recently arrived on the hospital scene, at the most impressionable and formative stage of their undergraduate career, to help them develop a global view of the patient and his illness and to generate a sense of vocation and purpose in those participating in the introductory clinical course. "The mastery of such clinical methods is perhaps the most important objective of the clinical curriculum."[8] The medical wards and outpatient clinic should provide both students and postgraduates with a wide range of relevant clinical experience including the opportunity to become familiar with practical therapeutics and the techniques of investigation. The general physician has an essential part to play in the training of his successors. As senior registrars, they should have adequate experience of working in busy medical units and should not depend entirely upon rotation from one specialty to another.

TEAMWORK IN MEDICINE

The close personal and confidential nature of the doctor–patient relationmentship has long been at the centre of the practice of medicine. In acknowledgement of our responsibility to those in our care we undertake to do everything possible to relieve their symptoms and aid their recovery. This often means enlisting the help of those in other professions, and learning to work as members of a team is an essential part of our training. I hope our young colleagues already appreciate that looking after sick people in hospital calls for such teamwork in which members of the caring professions, scientific and technical staff, administration, clerical, catering and supporting services all play their own essential roles.

It has been said that modern scientific medicine is essentially an affair of the intellect, but to regard a malady as an intellectual puzzle could divert our attention away from the patient as a person and cause us to forget that his present and future are involved.[21] In the course of our clinical work we should remember that those who are most intimately and constantly in touch with the petients are the nurses. They see the consequences of illness, observe the effects of treatment and are especially conscious of the personal needs of the individual. Upon them falls much of the responsibility for maintaining the patient's morale while he comes to terms with his illness, and for helping him over the numerous difficulties that may arise during his stay in hospital. It is fortunate therefore that as resi-

dent pupils and pre-registration housemen you will have the opportunity of working closely with the nursing staff and gaining personal experience of their ministry of sympathy and support. You could not do better than learn from them.

The atmosphere in a clinical unit greatly depends on the character and personality of the ward sisters and it is they who determine the quality of life for the patients and medical staff. Those who have had the good fortune to work in this hospital are very conscious of the special gifts of heart and mind that are to be found in Royal nurses who, more often than they realise, act as our consciences.

I feel sure that in years to come the ideals of this hospital and the friendships that have been formed here will be a source of inspiration and strength. I hope that, for you, medicine will always be full of interest and enjoyment and that in blessing your patients it will also bless you. Our profession has a caring and generous tradition and a position of affection and respect in the community. In seeking appropriate remuneration for our work let us not endanger that which so greatly enhances our job satisfaction and our sense of purpose in life by behaviour that is out of character with our calling. Rather, may we, in partnership with colleagues in other professions, make our full contribution to the health and happiness of the individual and of society which we serve. Freely we have received: freely let us give.

And finally, in the words of Sir William Osler, let us "remember what we are – useful supernumeraries in the battle (of life), simply stage accessories in the drama, playing minor but essential parts at the exits and entrances or picking up, here and there, a strutter who may have tripped upon the stage."

ACKNOWLEDGEMENTS

I am most grateful to Professor I. C. Roddie, Dean of the Faculty of Medicine and Professor J. H. Elwood, Department of Community Medicine, Queen's University, Belfast, and to Dr. J. W. Paulley, Consultant Physician, Ipswich Hospital, for their kindness in making available to me important reference material. I am especially indebted to Miss May Weller for typing the manuscript and to Mrs. Ann Sullivan for invaluable secretarial assistance.

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SOCIOLOGICAL, ANATOMICAL AND PHYSIOLOGICAL CHANGES IN FIRST-YEAR STUDENTS ENTERING QUEEN'S UNIVERSITY, BELFAST, OVER THIRTY YEARS, 1948 - 77.

1. Preliminary Report.

by

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INTRODUCTION

THE Student Health Service at the Queen's University of Belfast has carried out compulsory routine medical examinations at the behest of the Senate and Academic Council on all first-year undergraduate students since 1948.

The original health records were designed by the first full-time Medical Officer appointed, Dr. Wilson Johnston. It is much to his credit that a very similar format is still considered suitable today. It is designed for A4 size paper and allows accurate recording and easy recall of basic medical and social data. Attempts were made at the outset to standardize examination techniques. Heights and weights are measured with light indoor clothes and without shoes. The blood pressure is recorded using a 22 cms cuff, with the student recumbent.

METHOD

In the preliminary study it was decided to examine 10 per cent of each year's records. Each student is allocated a number in sequence on his first attendance; thus the first student examination in the academic year 1948-9 is numbered 00001 while the last student examination in 1977-8 is numbered 30,398. The student health service number is quite separate and different from the University number, and it is not circulated to other departments, thus preserving confidentiality. The 10 per cent sample of each year's charts was selected by computerised random number selection technique.

From these records specific sociological and medical data were extracted and put on to punch cards for computer analysis. In the social section the following data were recorded, sex, year of birth, year of entry, number of siblings, religion, and the social class of the father's occupation. To this was added the medical data of height, weight, systolic and diastolic blood pressure, with menarchial age when appropriate.

To discover if the 10 per cent was statistically accurate the early results were compared with earlier published studies, (Johnston et al 1957 and 1962). It was confirmed that a 10 per cent sample was adequate for all general analyses, but some of the fine sub-divisions lacked statistical significance.

RESULTS

Changes in sex ratio

Figure 1 shows the growth of one red-brick university from an intake of less than 500 per annum to one nearly three times as large. The population of

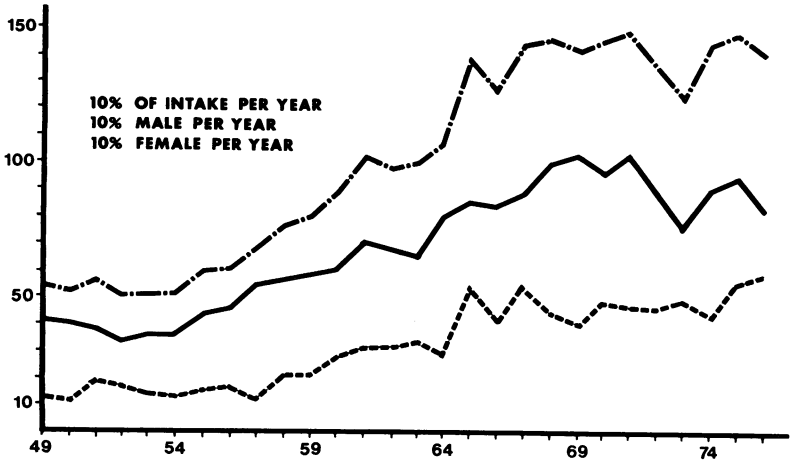

FIG. 1 Changes in sex ratio of a 10 per cent sample of the student intake.

Northern Ireland grew by some 16 per cent over the same period so the natural growth alone does not explain the hugh explosion in the numbers entering tertiary education, especially between 1955 and 1965.

There have been more males than females in the general population of Northern Ireland, even back in the 1951 census, and this gap has grown as the male population increased by 17 per cent and the female population by 15 per cent since then. Nevertheless, women are well under-represented in the University. In the intake of the early fifties only some 20 per cent were women and there has been a gradual increase to 36 per cent in 1977.

Changes in social class

Figure 2 shows 10 per cent of the number of students enrolling annually from each social class. The class is determined by the reported occupation of the student's father. It is common knowledge that Social Class I and Social Class II children do better in higher education than children from lower social classes. In the 1971 census, Social Class I comprises 2.4 per cent and Social Class II 20.4 per cent. In the same year in the Queen's sample Social Class I made up 12.4 per cent and Social Class II 31 per cent. Conversely, Social Classes IV and V are under-represented (4.8 per cent instead of an expected 22.8 per cent in Class IV, and 2.8 per cent instead of a predictable 10 per cent in Class V). Only Social Class III at Queen's matched the whole population figure, although this is more true of 1977 figures than the 1971 figures.

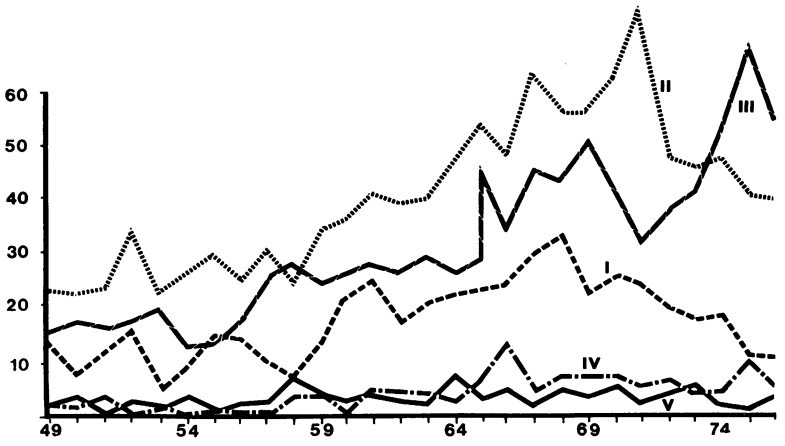

FIG. 2 Enrolment of students according to social class of father. I, Professional; II, Intermediate occupations; III, Skilled occupations; IV, Partly skilled occupations; V, Unskilled occupations.

A more surprising finding is the remarkable fall in the overall numbers of Social Class I and Social Class II students during the past decade. Although the total annual first year enrolments has remained around 1,400 per annum, Social Class I intakes dropped from 330 in 1968 to 100 in 1977. Social Class II students, after a high peak of 750 students in 1971 dropped to a 1977 intake of 460. Conversely, Social Class III intakes have risen nearly as steeply, almost doubling in the same seven-year period from 310 to 550 students.

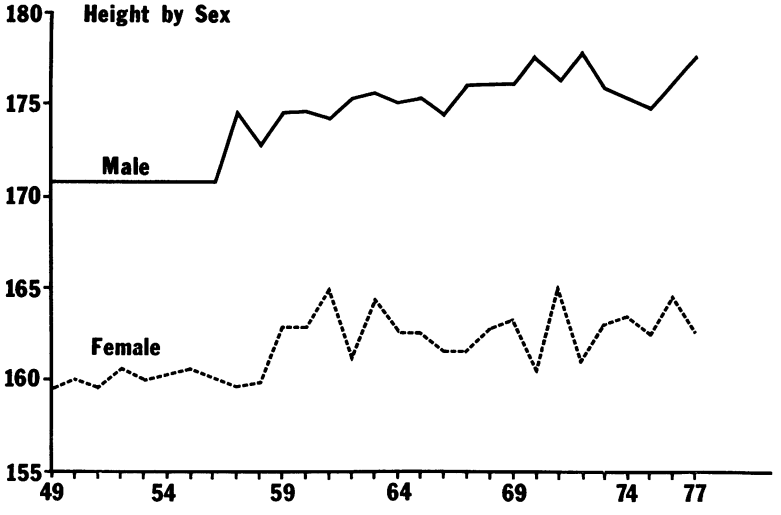

FIG. 3 Height in centimetres of male and female students on enrolment.

Changes in height and weight

Figure 3 shows the height of Queen's students in centimetres from 1949 onwards. The mean height of men born before the second world war was 171 cms (5' 7.3") while women of that period were 160 cms (5' 3") on average. These figures change quite dramatically with children born during the war years, with both men and women being 3 cms taller. This upward trend has continued but with a much more gentle gradient. Female students of 1977 are some 4 cms taller than the young ladies of 30 years before while the men are on average 6 cms taller. The mean weights of male and female students in kilograms from 1949 onwards are shown in Figure 4. Tanner (1965) stated that men born later in the century are consistently heavier and taller than those born earlier, and that women on the other hand are decidedly lighter than formerly. This study confirms the latter statement with a remarkable fall in the mean weight of women of 6 kg (13 lb), but in the Queen's University of Belfast men have also shown a small but significant decrease of between 1 and 2 kg (2 to 4 lb).

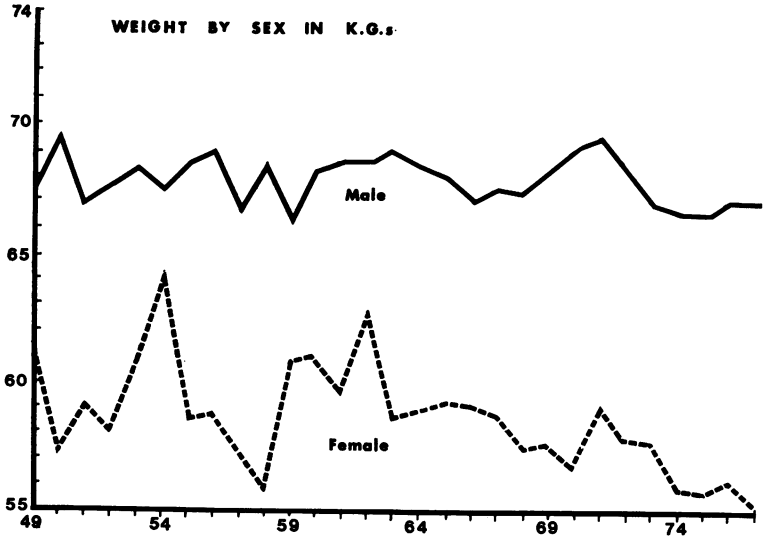

FIG. 4 Mean weights in kilograms of male and female students on enrolment.

Changes in the obesity index

The obesity index is a mathematical formula designed to overcome the fairly clear disadvantages of a straight comparison of height and weight. The index is the weight in kilograms multiplied by 100 and divided by the height in centimetres squared. This usually gives ranges from 0.180 for the thinner, taller subject, i.e. 'the more linear' person and up to 0.400 for the very obese. From Figure 5 one can see a consistent downward trend in the thirty-year period confirming that

students of today are of much more linear build than their counterparts of 30 years ago.

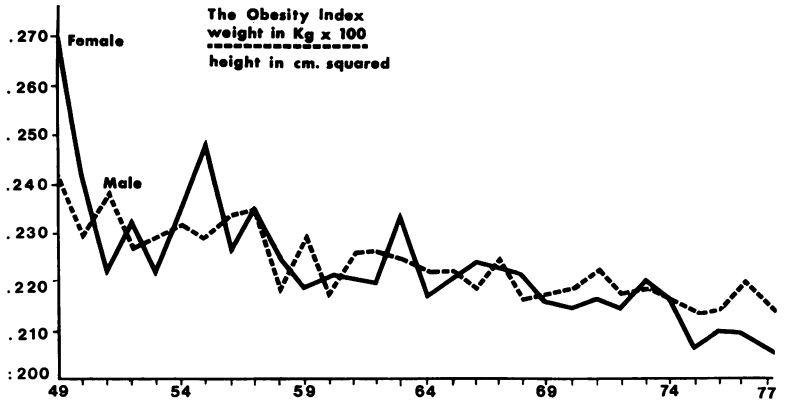

FIG. 5 Obesity index of male and female students on enrolment.

Changes in blood pressure

Figure 6 shows a continuing gradual fall in both the systolic and diastolic blood pressures in both sexes. It appears that the average systolic B.P. in the male is consistently higher by nearly 10 mm Hg than females of the same era. Men who enrolled in Q.U.B. in 1948 had average readings of B.P. of $^{131}/78$. The gradual steady fall recorded a 1977 figure of $^{123}/72$. In the female the comparable fall was from $^{122}/78$ to $^{110}/70$.

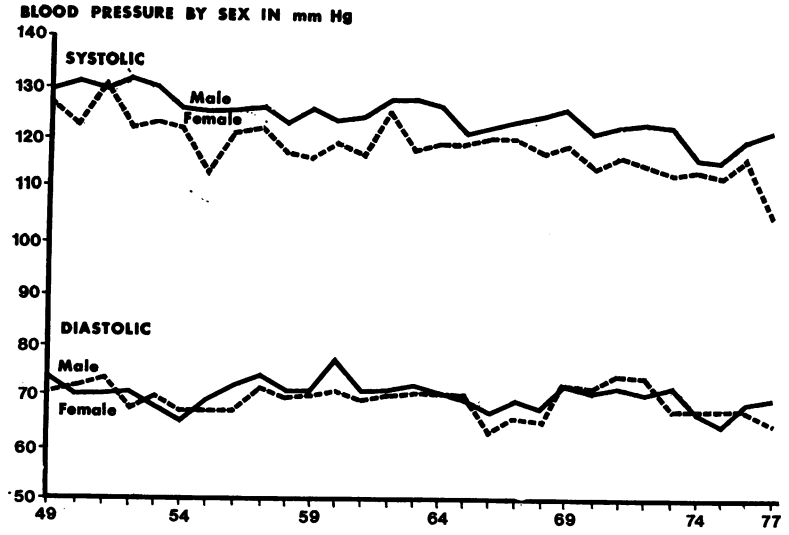

FIG. 6 Systolic and diastolic blood pressure in students on enrolment.

Changes in the menarchial age

Figure 7 shows the mean recorded menarchial age of students by their year of birth from 1934 onwards. Students born before that year were excluded because of insufficient sample size. The mean of the students interviewed over the 30 year period 1948 — 1977 was 12.7 years. This is not an easy graph to interpret. One possibility is that the menarchial age, which had been falling since Victorian times continued to fall until 1946, but that this trend became reversed at this time. Professor J. M. Tanner in a personal communication warns against such simple deductions. He points out that "the 1939-born figure is something of a maverick, and even the '45, '46 and '47 figures constitute a run that may not be significant". He suggested that another interpretation of the graph could be that there has been no change other than random fluctuations over this time.

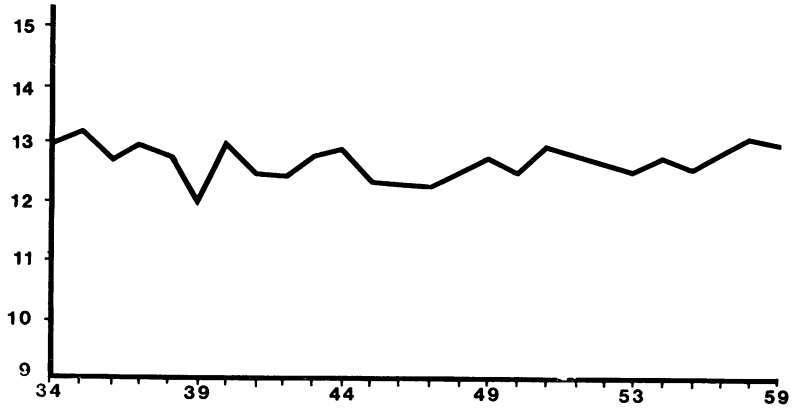

FIG. 7 Changes in menarchial age by year of birth from 1934 onwards.

DISCUSSION

Dann (1969) emphasizes an inherent difficulty of interpretation wherein each successive sample is heterogenous, and where there is differential representation in particular sub-samples. The Queen's University of Belfast is essentially a provincial university for the Province of Ulster. The political unheavals since 1969 have tended to emphasize this fact, with the flow of overseas students gradually drying up, especially those coming from England and Wales. The projected study of a larger sample with a breakdown by country or even county of origin should help in overcoming these difficulties.

Another source of inaccuracy in such a study is variation of methods of collecting the data. The importance of such vital standardization is essential if reliable comparisons are to be made, and most critics will start by doubting these figures rather than any subsequent interpretation. For example, Tanner reports a 3 cm difference in height in his sample compared with Rosenbaum (1954) which he attributes to different measuring techniques. Avoidance of this basic error must

therefore be emphasized. (Johnston 1957, Tanner 1966 and Dann 1969). The nursing and medical staff of this Student Health Service have worked continuously and consecutively in one building and have passed to one another the basic tenets laid down by Dr. Wilson Johnston.

The sociological changes in Figures 1 and 2 are in part common knowledge. The gradual uptake of more university places in faculties such as the Faculty of Medicine and the Faculty of Science by females explains part of the increase in the number of women students. But perhaps one should rather ask why the number of women is still only 36 per cent of the total intake in 1977-8. Presumely the answer to this question lies in the fields of sociology or education, and not in medicine. The remarkable drop in Social Classes I and II students over the past decade, and at the same time the opposite rise in the Social Class III students requires amplification and explanation. Why should this have happened? One possible explanation is the political unrest in Ulster. Because of the undoubted tensions, some families may well choose to send their children to other parts of Ireland or to Great Britain. If this were the case one might postulate that there would be different presentations in the religious groupings. In fact this study shows that there have been equivalent changes in both Protestant and Roman Catholic classes. Apart from The Troubles, another important event occurred in 1965 which could well explain these trends. There was the introduction of the Universities Central Council on Admissions which offered a broad choice of British Universities or Polytechnics to all A-level candidates. It seems likely that children from middle class homes who had already had opportunities to visit Great Britain started to choose to go there, once given the express invitation of UCCA.

One other factor which has to be considered is the means test method of issuing grants to middle class students which mitigates against them so severely that they are often the paupers among the undergraduates. Research among school leavers could only produce the explanation of these changes.

The physical changes noted in students at Queen's over 30 years reflect in many ways findings from other parts of the world. Tanner (1965) states that there has been a secular trend in West European young adults since about 1870 to increase in height at the rate of 0.6 to 0.8 cm per decade. In his other paper (1966) he wrote that "there is no really satisfactory data from mature height of twenty-year old men in Gt. Britain".

The National Study of Health and Growth was set up in 1972 to monitor growth in primary school children. Scottish children are lighter and shorter in all age-sex groups (Rona & Altman 1977). The same authors (1978) studied the social factors which might explain some of these variations. They report that non-social factors, especially the parents' height and the child's birth weight were perhaps more significant, but nevertheless sibship size, father's social class and his employment status were also very important. It is interesting to see that there are significant differences between English and Scottish children in their response to these social factors.

Tanner (1966) reports a mean height of 175 cm for young men in the early sixties. This corresponds very closely with these figures. Tuddenham's (1954) famous study of middle class children in Berkeley reported a mean of some 6 cm taller for both boys and girls in California. Guatemalan middle class seventeen year old boys and girls on the other hand (Johnston, F. E. et al, 1976) were 171.1 cm and 159.2 cm respectively. These children were born in the early fifties and would compare more correctly with the Queen's students entering around 1968 than Berkeley children who were born in 1928 and 1929 — fifty years ago! Johnston, F. E. (1976) had another group of children in his study. They were American children living in Guatemala. This group corresponds very closely to Queen's students of the same vintage. Similarly, Swansea girls (Dawn and Roberts, 1969) entering university between 1959 and 1970 are less than 1 cm smaller than the Queen's ladies. It has been claimed that there are gradients of increasing stature as one travels from the North West to the South East of the British Isles (Roberts, 1952) although Tanner (1966) feels that these differences may be trifling. They have now been confirmed by Rona and Altman (1978).

Measurements of obesity are much more complex than the traditional average weight against height charts which are to be found in commercial weighing machines in the market place. Skin-fold thickness is perhaps the most popular measurement of obesity but other mathematical formulae are very reliable. Seltzer (1966) favoured the Ponderal Index which is the height in inches divided by the cubed root of the weight in pounds. The Ponderal Index gives numbers in the region of 14.7 for the most linear and 10.6 for the most obese. Another ratio, the one illustrated here, and described by Khosla (1967) is the Obesity Index or the Body Mass Index. The Editorial B.M.J. (April 1978) confirmed that this is an extremely accurate calculation.

Both male and female students at Queen's today are much more linear than those of 30 years ago. Indeed they are considerably less obese than the declared desirable heights and weights of the Metropolitan Life Assurance Company, which can be re-stated as 0.217 for women and 0.231 for men of moderate build. The present day Queens students index is 0.209 for women and 0.219 for men. In the Berkeley study, the Californian children born 50 years ago (Tuddenham 1954) were much more linear than the equivalent age groups at Queen's (0.217 c.f., 0.240). This present study does not confirm the findings of Montegriffo (1974) who stated that the present male population is becoming more obese and the secular change has progressed. However, one can confirm that the female population is quite clearly much less obese.

The steady and continuing downward trend of both systolic and diastolic blood pressure, but particularly the former, is seen in both sexes. This finding was reported by Johnston (1962) and it was claimed by him that the blood pressure was definitely higher in those with bigger arm girths. The female arm girth average was 24.5 cms in his study and the male arm girth was 26.0 cms. It is well known (Pickering et al 1954; Mann 1974) that one finds higher blood pressure readings when either the arm girth or the obesity are correlated and this has been attributed by some to be due to the size of the sphygmomanometer cuff. If the

encased rubber bag fails to completely encompass the whole arm then there may be higher blood pressure readings. Similarly, sphygmomanometers with extra long tubing, such as wall-fitted machines, will give higher readings. Further research is clearly needed to explain this finding, for one might hope that the downward trend heralds an improvement in the incidence of degenerative arterial disease of the middle-aged. Perhaps it is in such extended studies that the aetiology of essential hypertension, or cardiovascular disease in middle age (Pickering et al 1954; Reid 1974) might be explained. Perhaps too we can take some comfort in the fact that the last decade's civil unrest has not caused any alteration in the downward trend of B.P. readings.

The menarche has long been regarded as one of the best measurements of the rate of maturation in females and it has been falling at the rate of 3 to 4 months since Victorian times. Tanner (1973) shows figures from several different European countries which reported the age of menarche as high as 17 years in 1840 in Oslo, but this had fallen to between 12.6 and 13.2 years by 1970. Brundtland and Walloe (1973) have reported that this trend has stopped, in their study of Oslo schoolgirls, with mean ages as 13.27 years in 1952 and 13.24 in 1970. Tanner's paper goes on to show that the downward trend has also halted in London schoolgirls giving a mean of 13.02 years. Roberts and Dann (1975) in their study among Swansea students confirmed the change with their lowest mean being 12.46 years in students born in 1946. The Queen's University students showed a mean of 12.36 years in that same year, whereas those born in 1959 gave a mean menarchial age of 13.02 years.

The cause of the downward trend in the menarche was usually stated to be due to better nutrition and less inter-marrying as transport became easier. It has been stated that the decline in menarchial age started with the invention of the bicycle. Dann (1969) stated that the socio-economic class of the father influences stature, though in contrast it did not have any effect on menarchial age. Roberts (1975) points to other variables, including the number of siblings and the position in the family, although his sample sizes are perhaps on the small side for a true analysis. He also reports that girls of more linear physique experience a later menarche. That corresponds with the findings here, but it would be rash to assume a cause and effect connection.

There are perhaps more questions raised, than answers given by this preliminary report. A further study of larger groups will be necessary which will allow for more detailed analysis. It is planned to study each fifth year starting with 1953. Further mathematical analysis of the menarchial age, and a relationship with social class will be undertaken.

SUMMARY

There have been significant changes in the sociological, anatomical and physiological characteristics of first-year students at Queen's University, Belfast, over the period 1948-1977. Among these are:—

(1) the gradual increase in the number of women students from 20 per cent to 36 per cent.

(2) a marked fall in students from Social Class I and II homes over the past decade of at least 50 per cent. In contrast Social Class III families have sent many more of their children to Queen's.

(3) Male students are on average 6 cm taller now than 30 years ago and women over 3 cm taller. Male students are some 3 kilograms lighter than 30 years ago while women are as much as 7 kilograms lighter. These findings indicate a much more linear population with an obesity index falling from .240 to nearly .210.

(4) Physiological differences include a fall in both systolic and diastolic pressure readings in both sexes; means have fallen from $^{131}/78$ to $^{123}/72$ in males and $^{122}/78$ to $^{110}/70$ in females. A further important physiological finding is that the age of onset of the menarche, which had been falling since Victorian times has now ceased to fall, and indeed is tending to rise again. Girls born in 1946 had an average menarchial age of 12.36 years while those born in 1959 had an average menarchial age of 13.02 years.

Tentative explanations for these findings have been put forward.

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PUVATHERAPY FOR PSORIASIS AND OTHER SKIN DISEASES
AN INITIAL REPORT

by

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SUMMARY

Fifty-two patients with severe and resistant psoriasis were treated with 8-methoxypsoralen followed by high intensity long wave ultraviolet light over a 12-month period at the Royal Victoria Hospital, Belfast. One hundred per cent clearing of the plaques of psoriasis was obtained with an average dose of energy of 53.5 joules in 43 (96 per cent) of 45 patients and the other two materially improved. Seven are still in the clearing phase. Early side effects were uncommon. There was no clinically significant change in laboratory or ophthalmological findings. Of the nine patients who complained of arthritis, four had radiological evidence and one showed radiological improvement after PUVA. In this study all seven patients who had been using large doses of topically applied steroid cream (up to 200 g Dermovate per week for two years) did not show adrenal suppression.

INTRODUCTION

Although the precise cause of psoriasis is unknown the characteristic lesions are associated with epidermal proliferation and increased enzymatic and metabolic activity. Attempts to control the rapid replication of cells by local application of cytotoxic agents such as 5-thiouracil and nitrogen mustard have been largely unsuccessful. Systemic cytotoxic agents, in particular methotrexate, have been more successful. They inhibited DNA synthesis and thus provided a stimulus in the search for other less toxic inhibiting agents. Psoralens in the presence of UVA (320-400) were seen to inhibit DNA synthesis (Walter et al, 1973) and this was extended when Parrish et al (1974) and later Wolff et al (1975) reported successful treatment of psoriasis using the technique of photochemotherapy. This involved the oral administration of 8-methoxypsoralen (8-mop) followed by exposure tohigh intensity long wave ultraviolet light. This was an excellent combination of two treatments, neither of which was effective on its own, producing synergistic results. The spectrum of psoralens and photosensitization lies within the UVA range, and as UVA requires 100 times more energy than UVB to produce erythema this enables a more prolonged therapy. The treatment was introduced in the Royal Victoria Hospital, Belfast, in September, 1977, and the following is a report of a trial over one year.

EXPERIMENTAL PROCEDURE

Selection of patients

Patients were selected for the trial under four groups:

Group A: patients unresponsive to conventional tar and dithranol therapy.
Group B: patients who had received large amounts of topically administered steriods in whom it was hoped to prevent a flare-up when treatment was abruptly discontinued.
Group C: patients receiving methotrexate with anticipation of withdrawal of the drug.
Group D: patients with psoriasis confirmed to palms of the hands and soles of the feet.

In addition, only those over the age of 18 were included in the trial.

Dosage of 8-methoxypsoralen

The drug was given to each patient on a weight related basis as shown in the following schedule (Table 1).

TABLE I

Schedule for 8-MOP

Weight of patient (kg)	Dose of 8-MOP (mg)
<30	10
30—50	20
51—65	30
66—80	40
81—90	50
90+	60

Equipment for UVA radiation

The system chosen was a Waldeman PUVA, 6,000 for a whole body radiation with the Waldeman 200 for hands and feet.

Measuring the sensitivity of individual patients

This was done subjectively by skin typing and objectively by phototesting. Skin typing was determined as shown in Table II.

TABLE II

Skin typing of patients in present series

Skin type	History	No. of patients
1	Always burn, never tan	13
2	Always burn, sometimes tan	17
3	Sometimes burn, always tan	19
4	Never burn, always tan	3

Phototesting was performed on each patient. The minimal phototoxicity dose (MPD) is the dose which produces barely perceptible but well defined erythema. However, this does not forecast the patient's capacity to tan. Therefore a patient with a high MPD and at a low sensitivity may tan very slowly and so produce erythema to even small increases in UVA. As adjustments are necessary because of increased tolerance to initial UVA dosage it is helpful to know the patient's ability to develop pigmentation with respect to erythema. This is calculated as a photosensitivity pigmentation index (PPI) as in Table III. As PPI

TABLE III

$$PPI = \frac{\in E72 + \in P120}{\in E72 + \in P120}$$

Where

$\in$ E72 is the sum of all erythema readings at 72 hours.
$\in$ E120 is the sum of all erythema readings at 120 hours.
$\in$ P72 is the sum of all readings for pigmentation at 72 hours.
$\in$ P120 is the sum of all readings for pigmentation at 120 hours.

increases above 1 the greater the possibility of burning and consequently as it decreases below 1 the greater the possibility of developing tolerance.

Treatment schedule

Each patient received treatment three times per week. There were three variables, psoralen ingested, the UVA radiation and the patient's sensitivity to PUVA. In the trial psoralen was kept constant on a weight related basis and the other two factors were adjusted according to the individual response. The initial dose of UVA was the minimal phototoxicity dose and those increments were calculated from the PPI. When clearing was complete the patient was placed on maintenance therapy, initially twice per week, reducing in some cases to one treatment every two months. This interval was not exceeded as at this stage the lesions developed accounting for not more than 5 per cent of the body surface. The patient accepted these but it was felt that further reduction would result in more widespread lesions. If the patient on maintenance PUVA developed psoriasis on 5 per cent or more of the skin surface, he was restored to thrice weekly treatment with a dose of UVA as for last maintenance exposure. This was increased as required.

Laboratory tests

Each patient had the following tests performed prior to commencing PUVA therapy:— full blood picture, differential white cell count, erythrocyte sedimentation rate, block analysis – this included serum sodium, potassium, chloride, carbon dioxide, urea, calcium, cholesterol, glucose, bilirubin, alkaline phosphatase, AST, ALT, total protein, albumin, uric acid, creatinine, creatine phosphokinase, lactate dehydrogenase, iron and triglycerides. All these tests were repeated after

six PUVA treatments, then after 12 and thereafter monthly or more frequently depending on the uniformity of the results. The patient had a complete ophthamological examintion initially, after six months and subsequently at six-monthly intervals or earlier if requested by the ophthalmologist.

RESULTS

Table IV showss that satisfactory clearing of the lesions was obtained in patients in Groups A, B, and D, and indicates the frequency and dose required to produce this outcome. It compares the results as regards number of exposures and dosage with those in the literature. Satisfactory results have been obtained here with a lower level of radiation.

Some more resistant cases are in the five in Group C who had been treated with methotrexate. Three with psoriasis of 4 months, 21 and 22 years and treated for 4 weeks, 2 years and 1½ years with 7.5, 10.0 and 2.5 mg weekly, responded to treatment comparable to those in Groups A, B and C. One affected for 30 years and treated with 7.5 mg methotrexate weekly for 1½ years, although he has now responded, required PUVA therapy for one year. The other patient with psoriasis for 23 years had been treated with 15 mg weekly for two years and failed objectively to respond to PUVA.

TABLE IV

Results of PUVA therapy in groups A, B, D, and results recorded by Melski et al and Wolff et al

Group	*No. of patients*	*Average No. of exposures*	*Joules/cm² at last clearing*	*Average No. of joules/cm² to produce clearing*
A	20	23.52	55.35	4.15
Melski et al		23.6	251.0	11.8
Wolff et al		13.39 ± 7.08	66.1 ± 56.7	—
B	11	21.75	68.7	3.8
D	9	Hands 19.00	47.0	3.6
		Feet 32.0	117.7	4.7

DISCUSSION

The dermatologists decided that the day-to-day management of the machine would be best carried out by physiotherapists in their department and this has worked well. The patients are routinely reviewed and their therapy regulated by a dermatologist. The number of joules required to produce clearing in association with the mean joules per cm squared at the last treatment compared to the results obtained by Melski et al (1971) and Wolff (1978) is shown in Table IV.

The complications as a result of therapy may be short-term or long-term. Short-term side effects which had been expected and those found in our series are shown in Table V. The most troublesome side effect in the short-term was

TABLE V

Complications in the present series

	No. of patients
Eczema	5
Pruritus	12
Nausea	3
Ankle oedema ...	0
Pustules	0
Blisters	1
Herpes simplex ...	0
Acne vulgaris ...	3

pruritus. This, however, was easily controlled by an antihistamine. Nausea was also a prominent symptom but again disappeared when PUVA was continued. Long-term side effects must include eye complications such as cataracts and skin cancer. No opinion about either may of course be given after one year's therapy. There is still no evidence of skin neoplasm in any patient after treatment for two years with PUVA.

All laboratory results showed no variation after PUVA therapy and it can be concluder that PUVA in the short-term does not materially alter renal or hepatic function. Of interest is the subjective improvement in arthritis noted in five patients and in one of these there was radiological evidence of improvement. It is also of note that three patients, all of whom were male, noted excessive hair growth (anterior chest, beard area). The nail growth was measured for each of these three men and was found to be within normal limits. The plasma testosterone was also within normal limits for all patients. Of note, none of the patients in this series showed the expected exacerbation when the topical corticosteroids were abruptly discontinued and none showed evidence of adrenal suppression even when applying Dermovate 200 g per week for two years.

CONCLUSION

PUVA is obviously a beneficial and effective therapy but what is worrying and unpredictable in a long-term skin carcinogenic effect in view of its action on DNA (Stern et al 1979). In this series 100 per cent clearing was obtained with an average dose of energy of only 53.5 joules as compared to 251 joules (Melski et al 1977) (see Table IV). None of the patients developed skin cancer and this may be related to the lower dosage, but in addition no patient had a history of previous skin neoplasm or radiation therapy. There is also the possibility of an effect on elastic tissue, producing premature ageing. While these complications remain uncertain the treatment must be kept under careful medical control, and obviously as a low dose of energy can produce 100 per cent clearing it is prudent to treat the patients with this lower dose regime. At the moment there is no place for it as a home therapy.

ACKNOWLEDGMENTS

Our thanks are due to Dr. J. M. Beare for his help and advice and allowing us to include his patients in this report. Our thanks are also due to the Department of Physical Medicine and, in particular, Miss Thompson and Miss Bruce; the nursing staff of the Department of Dermatology; the Department of Pathology; in particular Dr. J. Sloan; the Department of Ophthalmology; the Department of Medical Photography; and the Department of Radiology, in particular Dr. A. D. Gough.

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MEDULLARY CARCINOMA OF THE THYROID GLAND

by

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INTRODUCTION

MEDULLARY carcinoma is an uncommon tumour of the thyroid gland which has been recognised only during the last 20 years. Between 1965 and 1978, 14 cases of medullary thyroid carcinoma have been diagnosed histologically in Northern Ireland. The purposes of this paper are to document the relevant details of these patients, to review the main clinical and pathological features of medullary carcinoma of the thyroid and to discuss some aspects of investigation and diagnosis of the condition.

CASE REPORTS

Five of the 14 cases referred to are described in some detail. Between them they demonstrate many of the typical features of medullary carcinoma and its associated phenomena. The main clinical aspects of all 14 cases are summarised in Tables I and II.

TABLE I

Symptoms and signs in 14 *patients with medullary carcinoma of the thyroid gland*

Patients	*Sex*	*Age*	*Duration of symptoms*	*Goitre*	*Palpable Nodes*	*Diarrhoea*	*Other features*
J.D.	F	28	2 years	Yes	Yes	Yes	No
R.K.	M	62	7 years	Yes	Yes	No	No
*F.O'N.	M	65	Unknown	Yes	Yes	No	Squamous Carcinoma lip
W.T.	M	62	25 years	Yes	No	No	Left upper limb signs and Horner's syndrome
E.U.	F	40	6 months	Yes	No	No	No
M.P.	F	51	1 month	Yes	No	No	No
M.Ra.	F	55	15 months	Yes	No	No	Pain R. Neck
P.D.	M	11	9 months	Yes	No	No	No
G.H.	F	57	10 months	Yes	No	No	No
*N.I.	F	59	Unknown	Yes	No	No	Pain left eye
M.Re.	F	74	4 months	Yes	No	No	Weight loss dysphagia
B.C.	M	25	5 months	No	Yes	No	Marfanoid features mucosal neuromata
J.S.	M	59	1 year	Yes	Yes	Yes	No
P.M.	M	39	5 years	No	Yes	Yes	Hoarseness, Marfanoid features

* In these two patients the goitre was an incidental finding during admission for another reason. The age and duration of symptoms refer to time of diagnosis.

CASE 1 (R.K.)

A 62 year old male was referred to hospital with two lumps on the right side of his neck. The smaller swelling which had been present for six years was situated in the right lobe of the thyroid gland. The larger mass lay in the posterior triangle of the neck, partly covered by the sternomastoid muscle, and had appeared only three months prior to attendance. A clinical diagnosis of carcinoma of the thyroid with nodal metastases was made. Neck exploration was undertaken. A large hard tumour nodule was found at the lower pole of the right lobe of the thyroid gland. A clump of lymph nodes, obviously involved by tumour, was present at a higher level, deep to the sternomastoid muscle. A total right lobectomy and block dissection of the right side of the neck was performed. Histological examination revealed the presence of a primary medullary carcinoma of the thyroid with metastatic disease in the cervical nodes. A course of radiotherapy to the neck was given within eight weeks of surgery. Thyroxine was also prescribed in an attempt to maintain thyroid suppression. The patient remained well until four years after diagnosis, when he developed increasing weakness in both legs. A chest radiograph showed a discrete circular mass in the left lower lobe, where a myelogram revealed a complete block at the level of T9. Laminectomy was undertaken; the spinal cord and dura were being compressed anteriorly by a large tumour mass at the level of the radiological block. Palliative decompression was carried out. However, the patient's condition deteriorated and he died four days later. Post mortem examination revealed multiple metastases from the medullary thyroid carcinoma in both lungs, the liver and around the region of the spinal cord decompression.

CASE II (F.O'N.)

A 65 year old man was referred from the Northern Ireland Radiotherapy Centre, where he had been receiving treatment for carcinoma of the lower lip. Examination had revealed the presence of multiple discrete lymph nodes on the right side of the neck and in both supraclavicular fossae. There was no other significant symptomatology, but clinically the left lobe of the thyroid was enlarged and hard. Biopsy of the neck glands suggested a diagnosis of secondary medullary carcinoma of the thyroid. Formal exploration of the neck was undertaken. A large tumour in the left lobe of the thyroid gland was found. There was widespread involvement by tumour of the superficial and deep lymph nodes of the neck. A total left lobectomy was carried out along with removal of all accessible lymph nodes. It was recognised that a number of tumour nodes in the superior mediastinum were left behind. The pathology report confirmed the thyroid tumour as being medullary carcinoma, the malignant cells being dispersed in a matrix of amyloid. The postoperative course was uneventful and the patient was discharged five days after surgery on l-thyroxine. He remained well for two years but then began to experience diarrhoea which increased in intensity over a 12 month period. He developed hepatomegaly and a liver scan confirmed the presence of multiple metastases. He died three and a half years after diagnosis.

CASE III (P.D)

An 11 year old boy was referred to hospital because of a swelling in the left anterior triangle of the neck which had been present for nine months. A clinical diagnosis of adenoma of the left lobe of the thyroid gland was made. At operation a 2 cm nodule was found in the left lobe of thyroid and a subtotal lobectomy performed. The pathology report suggested that the lesion was a "well encapsulated carcinoma". The patient was started on thyroxine as suppressant therapy. He remained well but at review three and a half years later he was found to have a swelling in the right lobe of his thyroid gland. At exploration this was seen to be a well circumscribed nodule within the lobe and total lobectomy was carried out. Histologically this nodule closely resembled that seen nearly four years earlier,

but on this occasion an unequivocal diagnosis of medullary carcinoma was made following the demonstration of amyloid in the stroma. Further exploration of the neck was undertaken when all remnants of the thyroid gland were removed. Nodules of carcinoma comparable to the previous tumour were seen microscopically. In the postoperative period tetany proved troublesome but gradually regressed with the commencement of calcium therapy. The patient is now aged 17 years and is alive and well six years after his initial operation, with no clinical evidence of tumour. His calcitonin level, however, is elevated at 4.2 ng/ml (normal 0.08 ng/ml) which may indicate the presence of residual recurrent disease.

CASE IV (B.C.)

A 25 year old male presented with a five month history of tiredness, lethargy and general malaise. On examination he was noted to be tall and thin with Marfanoid facies. Bilateral cervical and axillary lymphadenopathy were noted but no goitre could be palpated. His lips were thickened and his tongue had a serrated edge. He had attended the Plastic and Maxillo-Facial Unit eight years earlier because of his facial appearance and poor dental condition. Dental clearance and biopsy of 'nodular thickenings' of the tongue and lips had been carried out at that time. Histological examination of the nodules had shown them to be neuromata. Biopsy of the lymph nodes in the neck and the axillae was now performed. Microscopically the cervical node was replaced by secondary medullary thyroid carcinoma with large amounts of amyloid. The axillary nodes simply demonstrated reactive change. Thyroid function tests, serum calcium and phosphorus levels were normal. However, the urinary levels of both catecholamines and vannilyl mandelic acid (VMA) were grossly raised at 1742 μg/24 hours and 39 mg/24 hours respectively, the normal levels being less than 120 μg/24 hours and less than 9 mg/24 hours. An intravenous pyelogram demonstrated a normal urinary tract. Nevertheless, on the basis of the urinary investigations the presence of a phaeochromocytoma seemed certain. Confirmation of the diagnosis was achieved by renal and adrenal aniography when a tumour of the left adrenal gland was identified. Selective venous sampling revealed a forty-fold increase in catecholamine concentration in the blood draining from the left adrenal gland over that draining from the right. In addition, the fasting plasma calcitonin level was now estimated at 9.28 ng/ml.

Abdominal exploration revealed not only a large 5 to 6 cm tumour of the left adrenal gland but also a smaller phaeochromocytoma of the gland on the right side. Bilateral subtotal adrenalectomy was carried out (Professor R. B. Welbourn). Five weeks later total thyroidectomy was performed (Mr. S. Taylor). Both lobes were diffusely infiltrated with medullary carcinoma tissue. A number of lymph nodes, obviously involved in tumour, were also removed at operation but formal block dissection of the neck was not attempted. Three parathyroid glands were visualised and appeared normal macroscopically. Postoperatively, steroid and thyroid replacement therapy was commenced and the patient progressed without major complication. A course of radiotherapy was given to the neck three months following thyroidectomy because of persisting palpable lymph nodes. At present, now more than three years since his surgery, he is in good health and has returned to his former occupation as a merchant seaman. However, although there is no clinical or radiological evidence of metastatic disease at present, his plasma calcitonin levels have remained high, almost certainly indicating continued presence of malignant tissue at some site, presumably in his neck.

CASE V (P.M.)

A 39 year old male was admitted to hospital for investigation of hoarseness which had been present for six months. Systematic questioning revealed that for five years he had been experiencing watery diarrhoea. He often passed 8 to 12 motions per

TABLE II

Clinical details in 14 patients with medullary carcinoma in the thyroid gland

Patient	*Operation performed*	*Node metastasis*	*Current status*	*Years from diagnosis*	*Persisting or recurrent tumour*	*Calcitonin estimation (normal 0.08 ng/ml)*
J.D.	Thyroid + node biopsy	Yes	Dead	9	Radiological metastases	
R.K.	R. total lobectomy + block dissection	Yes	Dead	4 2/12	Metastases at post mortem +++	—
F.O'N.	L. total lobectomy + accessible nodes	Yes	Dead	3 6/12	Hepatic metastases	—
W.T.	L. total lobectomy	Yes	Dead	12 days	Metastases at post mortem +++	—
E.U.	R. subtotal lobectomy	No	Alive	9	Yes – mass in neck	—
*M.P.	R. subtotal lobectomy	No	Dead	Operative Death	Multiple foci L lobe at post mortem	—
M.Ra.	Thyroid biopsy	No	Dead	3 4/12	Mass in neck	25 ng/ml
P.D.	L. subtotal lobectomy R. total lobectomy Total thyroidectomy	No	Alive	6	Only elevated calcitonin level	4.1 ng/ml —
G.H.	R. subtotal lobectomy	No	Alive	5 10/12	No	—
N.I.	L. total lobectomy	No	Alive	3 9/12	No	—
M.Re.	L. total lobectomy	No	Alive	3 8/12	No	—
†B.C.	Total thyroidectomy	Yes	Alive	3 6/12	Only elevated calcitonin level	9.28 ng/ml (pre-op) 6.56 ng/ml (2yr post-op)
J.S.	Thyroid + node biopsy	Yes	Dead	6/12	Mass in neck	357 ng/ml
P.M.	Node biopsy R. total lobectomy	Yes	Alive	11/12	Mass in neck	115.9 ng/ml

* The patient M.P. had a phaeochromocytoma of the right adrenal gland.

† The patient B.C. had bilateral phaeochromocytomata.

day, but at no time had he passed any blood per rectum. On examination he was tall and thin. A firm diffuse mass was palpable in the lower neck on the right side but was thought, clinically, not to be thyroid. Indirect laryngoscopy revealed a paralysed right vocal cord. Surgical exploration of the cervical mass showed it to be a cluster of matted malignant lymph nodes, several of which were removed for biopsy. Microscopically the nodes were replaced by metastatic medullary carcinoma of the thyroid gland. The plasma calcitonin level was grossly elevated at 115.9 ng/ml.

Further operation was performed with a view to carrying out a block dissection of the neck along with thyroidectomy. A 1 cm diameter nodule was present in the right lobe of the thyroid while the left lobe was quite normal. However, there were many tumour nodes surrounding the carotid sheath on the right side and extending deep into the neck. It was felt that these could not be removed successfully and so right total lobectomy alone was carried out. Histology con-

firmed that the nodule in the right lobe was a primary medullary thyroid carcinoma. In the 10 months since operation the patient's condition has remained fairly stable. He continues to experience intermittent diarrhoea, while a hard nodular mass persists on the right side of the neck. Plasma calcitonin levels remain very high.

HISTORICAL ASPECTS

Medullary carcinoma of the thyroid gland was described as a distinct clinical and pathological entity for the first time in 1959 (Hazard et al, 1959). It has been estimated as constituting approximately 7 to 10 per cent of all thyroid cancers (Hill et al, 1973) and as such is a relatively uncommon tumour. However, there is good evidence to suggest that it is a condition which has been significantly underdiagnosed and misdiagnosed in the past (Normann et al, 1976). Medullary carcinoma is a malignancy arising from the parafollicular or C-cells of the thyroid gland. These cells are thought to derive from neural crest ectoderm and to migrate at an early embryological stage into the primitive alimentary tract mucosa from whence they are carried to their final resting place in the thyroid, when this gland buds off the primitive foregut (Weichert, 1970). The C-cells in the mature gland lie outside the follicles in a parafollicular distribution and secrete the hormone calcitonin which plays a part in calcium homeostasis by lowering the plasma calcium level (Ganong, 1977).

In recent years interest in medullary carcinoma of the thyroid has grown significantly for a number of reasons. First, this type of tumour has shown itself to be biologically extremely active by producing, in different instances, a variety of hormones and enzymes including calcitonin and serotonin (Moertel, 1965; Williams, 1966), adrenocorticotrophic hormone (Scott, 1977), histaminase (Baylin et al, 1970), and prostaglandins (Williams et al, 1968). Second, it has been recognised that certain other endocrine anomalies may co-exist. Phaeochromocytoma and parathyroid adenoma or hyperplasia are most frequently noted and together with medullary thyroid carcinoma constitute the syndrome of multiple endocrine neoplasia, type II or MEN II (Sipple, 1961; Williams, 1965; Steiner et al, 1968). The patient (M.P.) who presented simply because of thyroid enlargement was shown at post mortem examination to have a hitherto unsuspected phaeochromocytoma of her right adrenal gland. However, no parathyroid abnormality was detected. A subgroup of patients exists (MEN IIb) in which medullary thyroid carcinoma, alone or in association with the adrenal and parathyroid lesions alluded to, is seen in the presence of multiple small neuromata of the lips, tongue or eyelids, a high arched palate, Marfanoid facies and occasionally other skeletal abnormalities. The patient (B.C.) is thought to fall into this category.

The third, and perhaps, in the Northern Ireland context, the most important stimulus to increasing interest in the condition has been the recognition that in a significant number of cases, medullary carcinoma of the thyroid has a strong familial tendency (Melvin et al, 1972; Jackson et al, 1973; Sizemore et al, 1977). It is now thought probable that in affected families inheritance is on an autosomal dominant basis. Thus, about 50 per cent of the offspring of a patient known to have medullary carcinoma might be expected to develop the disease. This obviously has extremely important implications in terms of investigation and follow-up of 'at risk' family members.

PATHOLOGICAL CONSIDERATIONS

Hazard and his co-authors described the characteristic histological pattern of medullary thyroid carcinoma as consisting of solid sheets and cords of spindle shaped or polyhedral cells, broken up by a stroma containing amyloid (Hazard et al, 1959). They emphasise the importance of the absence of any tendency towards papillary or follicular formation. Amyloid was present in easily recognisable quantities in the stroma in all 21 cases described by Hazard and his colleagues, and they imply that the presence of amyloid is necessary for a diagnosis of medullary carcinoma to be made. Other pathologists have largely agreed with this view (Woolner et al, 1961; Williams et al, 1966), although

Williams and his colleagues in their detailed studies of the pathological findings in medullary carcinoma, while excluding three cases from their review on the grounds that no amyloid could be identified microscopically, state that the absence of amyloid should not necessarily exclude the diagnosis of medullary carcinoma (Williams et al, 1966). This view has more recently been expressed with more conviction following the discovery that in some instances, although amyloid cannot be identified using the light microscope in what was thought to be a medullary carcinoma, electron microscopy reveals the presence of typical calcitonin secretory granules in the tumour cells (Normann et al, 1976). In all 14 cases reported here amyloid was identified histologically in the tumours. Electron microscopy was performed in only one instance (patient P.M.) where moderate numbers of densely staining secretory granules were visualised within the neoplastic C-cells.

CLINICAL FEATURES

Medullary thyroid carcinoma is less common in females relative to males than other thyroid cancers, resulting in a virtually equal sex incidence (Shapiro, 1976; Sizemore et al, 1977). Of these 14 cases, seven are male and seven female. Clinically the patient most commonly presents with a goitre or because of cervical lymphadenopathy. It can be seen that the majority of our patients (12 out of 14) had a palpable goitre at the time of presentation. Six patients, of whom two had no goitre, demonstrated cervical lymphadenopathy at initial examination (Table I). Less frequently diarrhoea may be the major presenting feature. The cause of the diarrhoea in such patients remains unknown although a number of

suggestions have been put forward and attempts made to incriminate several different agents, including calcitonin itself, serotonin and the prostaglandins E_2 and $F_2\alpha$ (Williams et al, 1968; Bernier et al, 1969; Steinfield et al, 1973). Diarrhoea seems to be more prevalent in those patients who have extensive local disease or disseminated tumour and would, therefore, appear to be related to tumour bulk (Williams, 1966). This suggestion would be in keeping with the findings in our own group of patients, three of whom were experiencing diarrhoea at the time of presentation (Table I). A fourth patient (F.O'N.) developed severe diarrhoea approximately two years after he had been diagnosed, and this persisted until his death from hepatic metastases.

Occasionally, the presenting symptomatology may be related to associated pathology, particularly phaeochromocytoma, or to metastatic disease. The importance of excluding co-existing phaeochromocytoma in a patient with medullary carcinoma before embarking on thyroid surgery cannot be over-emphasised. The patient (M.P.) in the perioperative and immediate postoperative periods developed a series of unexplained cardiac arrhythmias and hypertension which resulted in acute cardiac failure and death. The latter was almost certainly due to excess circulating levels of catecholamines released from a phaeochromocytoma of the right adrenal gland, unsuspected clinically but discovered at post mortem examination.

The malignancy of medullary thyroid carcinoma is thought to be of intermediate grade, but while in some patients the presence of the tumour is compatible with good life expectancy, others die rapidly from widespread metastatic disease. This variation is reflected in our own series in which the survival time following diagnosis ranged from six months to nine years, if the two patients who died in the immediate postoperative period are excluded (Table II). Hill and his colleagues (1973) report a crude overall five year survival after diagnosis of 37 out of 72 cases (51 per cent). The corresponding 10 year survival rate is 29 per cent. The best prognosis is associated with complete surgical removal of the tumour.

DIAGNOSIS

Diagnosis of medullary carcinoma of the thyroid gland was, until comparatively recently, essentially a postoperative one, based on histological examination of the surgical specimen. However, in the late sixties it was recognised by a number of workers, including Cunliffe and his colleagues in Newcastle, that a hypocalcaemic agent was present in the plasma of patients with medullary carcinoma and also in the tumour itself (Cunliffe et al, 1968). The Newcastle group provided convincing evidence that this was calcitonin, elevated levels of which were identified in the plasma of their patient preoperatively. Further, all hypocalcaemic activity and detectable calcitonin disappeared from the circulation within hours of total thyroidectomy. It was, therefore, suggested that medullary carcinoma of the thyroid did in fact produce calcitonin and could be diagnosed preoperatively by measuring plasma calcitonin levels. It was also suggested that,

by carrying out serial plasma calcitonin estimations, tumour recurrence and metastases might be detected at an early stage (Cunliffe et al, 1968). These hypotheses have subsequently been shown to be correct (Deftos and Potts, 1970; Melvin et al, 1971; Deftos, 1974). Although elevated plasma levels of calcitonin have been demonstrated in a number of patients (Table II), these estimations were all carried out after the diagnosis of medullary carcinoma had been made histologically. As indicated in Table II, three patients had clinically evident disease at the time of the calcitonin measurement, while two others were free a palpable tumour. It remains to be seen how these latter two patients progress. One problem has been the fact that the radioimmunoassay necessary to measure plasma and tissue calcitonin levels is available in only a very few centres. However, such an assay is now being established in the University Department of Medicine, Belfast.

Since 1965 only the 14 cases of medullary thyroid carcinoma reported here have been positively diagnosed in Northern Ireland. It is, however, likely that during the past 25 years there have been other cases misdiagnosed, the clinicians and pathologists perhaps being unaware of the existence of the entity.

FUTURE MANAGEMENT

Medullary carcinoma of the thyroid gland while usually presenting in a sporadic manner, reveals a strong familial tendency. The more enthusiastically this familial tendency is sought, the more often it is found. Sizemore and his colleagues (1977) in a recent review of a five year experience of medullary carcinoma at the Mayo Clinic, suggest that at least 19 per cent of patients assumed to be suffering from the sporadic variant, in fact have familial disease. It would, therefore, seem to be extremely important to investigate 'at risk' first degree relatives of patients who have been identified as having medullary thyroid carcinoma. The main object of this is to identify those carrying the disease at as early a stage as possible so that appropriate treatment in the form of total thyroidectomy can be instituted. Basal plasma calcitonin levels in such patients may, however, be totally normal.

In recent years, however, it has been shown that the hyperplastic or neoplastic C-cell mass can be provoked or stimulated into producing elevated plasma levels of calcitonin by a number of different agents (Hennessy et al, 1973; Cohen et al, 1973). Calcium, pentagastrin, alcohol and glucagon are among those which have been utilised in different centres and with varying degrees of efficacy in calcitonin provocation tests (Hennessy et al, 1974; Wells et al, 1975; Sizemore and Go, 1975; Dymling et al, 1976). Patients with medullary carcinoma show an elevation in their plasma calcitonin level following administration of one or more of these agents while normal individuals fail to demonstrate any change. Several centres have now reported the use of calcitonin provocation tests in the investigation of appropriate patients who are at risk, in an attempt to diagnose preclinical, occult medullary thyroid carcinoma (Telenius-Berg et al, 1977; Starling et al, 1978; Hillyard et al, 1978; Lips et al, 1978). In many instances an

elevated plasma level of calcitonin under basal conditions or following administration of a reliable provocative agent has been accepted as the only criterion necessary to proceed to neck exploration. When this policy has been adopted it has now been clearly shown that in virtually 100 per cent of patients whose necks have been explored, and in whom total thyroidectomy has been performed, medullary carcinoma or its precursor state C-cell hyperplasia has been found (Wolfe et al, 1973; Wells et al, 1975; Leape et al, 1976; Verdy et al, 1978; Wells et al, 1978).

The importance of early operation before the tumour has extended locally or metastasized is obvious. Availability of a reliable provocation test coupled with an aggressive surgical approach in appropriate cases should allow for some improvement in the prognosis for these early cases. Follow-up of patients operated on for occult, asymptomatic medullary thyroid carcinoma is still very limited (less than five years in most instances). However, early results would suggest that total thyroidectomy has been 'curative', as judged by negative postoperative provocation tests, in more than 80 per cent of patients whose diagnosis was made on the basis of provocative testing alone (Wells et al, 1978). Encouraged by these results, active provocative testing of the first degree relatives of patients in Northern Ireland known to have had medullary carcinoma has now commenced. Other index cases and their families have yet to be traced. Only time will reveal the relevance of the exercise.

ACKNOWLEDGMENTS

I would like to thank the consultant physicians and surgeons for allowing me to publish details of patients who have been under their care and particularly Professor R. B. Wellbourn and Mr. S. Taylor for their operative findings in case IV.

I am especially grateful to Dr. J. Sloan and Dr. J. D. Biggart for confirming the cases of medullary carcinoma from the pathological material.

The calcitonin assay in the Department of Medicine, Queen's University of Belfast, is under the supervision of Professor K. D. Buchanan and Dr. Joy Ardill.

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MINOR HEAD INJURIES — AN ADMISSION POLICY

by

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INTRODUCTION

Approximately one million patients are seen at United Kingdom hospitals each year after head injury. About 20 per cent are admitted (Jennett, 1978) and the majority of those admitted go home within 48 hours. The question arises, are many patients admitted for insufficient reasons, and this raises the related problem. Should all head injuries have a skull x-ray?

A review of the literature was undertaken with these questions in mind, in an effort to relate it to the experience of this centre and to formulate an admission policy for head injuries with particular emphasis on the mild head injury.

REVIEW OF LITERATURE

Head injury statistics

The 1974 Scottish Head Injury Management Study (Strang, 1978) produced some interesting statistics on head injuries. Three thousand five hundred patients with head injuries who attended Scottish Accident and Emergency (A and E) departments during two weeks in 1974 were studied. This represented 10 per cent of all attenders at these departments. Of all the adult males attending, 25 per cent had recent alcohol consumption.

Fifty-eight per cent had skull x-rays taken and of these, 2.7 per cent had a skull fracture. Although 20 per cent had altered consciousness at some time, only five per cent showed any impairment of consciousness when seen in hospital. If those who were not x-rayed are assumed to have no fracture, then the overall incidence of fracture was 1.5 per cent of attenders with head injury. A skull fracture was found in only 1.3 per cent of the 51 per cent of patients with no evidence of brain damage (i.e., altered consciousness at some time) who had x-rays taken. Strang found that 23 per cent of patients with head injuries attending A & E departments were admitted. Forty per cent of these had no evidence of brain damage (i.e., any degree of altered consciousness either before coming to the A & E department or when examined). Out of 826 patients admitted, 81 per cent were fully conscious in the A & E department and had no fracture (half of these patients gave a history of altered consciousness prior to coming to the A & E department). In this group of patients, many admissions may have been unnecessary.

Another interesting fact shown in Strang's study was that 41 per cent of the patients presented between 5.00 pm and midnight, 10 per cent between midnight and 8.00 am. Thus the majority of head injuries presented outside normal working hours, when the A & E department is staffed mainly by juniors. This underlines the importance of having clear guidelines for admissions.

Reasons for admission

Strang (1978) showed that there were two main reasons for admitting patients with head injuries for observation. Firstly, for continuous observation so that the development of an intracranial haematoma (in particular an extradural haematoma) may be diagnosed at an early stage; and secondly, for the correct diagnosis and management of minor head injuries so that post-concussion symptoms may be kept to a minimum (Potter, 1973). No proof exists that admission does minimise late symptoms, but Potter is not alone in believing that it does so.

The problem which most worries the casualty officer is that a patient with an apparently minor head injury who is sent home, may later develop an extradural or subdural haematoma. The course of an extradural haematoma may be very rapid, so the outlook should be much better if the patient has been kept in hospital and the deterioration recognised early. The onset of other complications of head injury such as intracranial infection and epilepsy is somewhat slower, so if the patient has been sent home there is time for him to return to hospital.

Patients who 'talk and die'

Attention has been drawn to the problem of those patients with head injuries who talk and die (Reilly et al, 1975). If the patient talked sensibly at some time after the head injury, then the degree of brain damage was not overwhelming. Three-quarters of patients with a head injury who 'talk and die' have an intracranial haematoma. Rose et al (1979) looked at 116 patients who 'talked and died'. They found 74 per cent had one or more avoidable factors and in 54 per cent an avoidable factor was judged to have certainly contributed to death. The commonest avoidable factor was delay in evacuation of an intracranial haematoma (others were epilepsy, meningitis, hypoxia and hypotension).

Mendelow (1979) studied the effect of delayed treatment of an extradural haematoma in 145 patients. The mean delay in patients who died was 15.7 hours and in good quality survivors mean delay was 1.9 hours (the time of delay being measured from the first recorded depression in the patient's level of response). He and his colleagues recommend direct admission to a neurosurgical unit for severe head injuries. However, this may well be impractical in many areas. If, therefore, delay in evacuation of an extradural haematoma is the commonest avoidable factor in death after head injuries and delay in treatment, so worsens the prognosis, we must try to avoid sending home any patients likely to develop this condition.

Skull fracture and intracranial haematoma

Galbraith and Smith (1976) studied 307 cases of acute traumatic intracranial haematoma in Glasgow. A total of 19 per cent had no fracture (vault, nose, skull base, the latter being diagnosed clinically). Further analysis showed 15 per cent of the extradurals and 17 per cent of the intracerebral haematomas had no visible skull fracture. Fourteen patients (five per cent of the total) had no skull fracture and no neurological signs nor symptoms. They calculated that this

represented 1 in 5,000 of head injuries admitted to Scottish hospitals in the 12 years of study. Clinical findings in these 14 patients are interesting. Five were children who developed signs in less than 48 hours. Five were aged 60 to 80 years who developed signs after 48 hours. They all had subdural haematomas (therefore 24 hours observation is unlikely to have been of any value). Four were aged 30 to 50 years who developed signs in less than 48 hours. These represented cases in adults in 12 years in a population of three million, which were possibly preventable. It is such a group of patients that the present admission policy is designed to detect.

Problems of diagnosis

Galbraith (1976) showed that 36 per cent of 307 intracranial haematomas had been deteriorating for over 12 hours in another hospital before being referred to a neurosurgical unit.. He showed that in 66 per cent of these the delay was due to erroneous diagnosis, either of cerebrovascular accident or of alcoholic intoxication. However, in 77 per cent of these 'drunk' patients and in 88 per cent of these 'strokes' a skull fracture was present. Hence the detection of a skull fracture either clinically or radiologically is a very helpful method of avoiding these errors. The intoxicated patient with a head injury is a very common problem. In city hospitals up to 25 per cent of the adult head injuries have consumed alcohol (Strang, 1978). One aid to diagnosis is to measure blood alcohol levels and if the value is less than 200 mg per 100 ml then the head injury is probably the cause of the confusion. Alcoholic confusion should always decrease with the passage of time. Fresh deterioration in the level of consciousness should be viewed with the gravest suspicion.

Another area of difficulty is in children. They are poor historians, difficult to examine and a larger proportion of children have an intracranial haematoma without a skull fracture. In adults 90 per cent of extradural haematomas and 75 per cent of those with other intracranial haematomas have a skull fracture (Jennett, 1978). Therefore, unless loss of consciousness can be confidently excluded, children with head injuries are best admitted.

Admission of more patients

Some papers in the literature propose admitting more patients with a mild head injury. Feiring of New York (1979) states that all closed head injuries should be admitted for observation, except those with the very briefest periods of unconsciousness (less than two minutes).

Potter (1973) gives three reasons for *not* admitting fewer head injuries. Firstly, the history of the patient and or that of a third party is frequently unreliable. Secondly, skull x-rays are not available in all A & E departments and are frequently misread. Thirdly, if one takes the patient seriously by admitting, this may decrease the incidence of the post-concussional syndrome. There is, however, a danger of causing neurosis by making the patient more worried about his condition than is necessary.

Value of skull x-rays

There is much debate in the literature on the value of skull x-rays in the A & E department. Many radiologists argue for fewer skull x-rays. Evans (1977) states that the presence or absence of a skull fracture rarely influences treatment after admission. However, it may well influence admission criteria and admission itself is a form of treatment. Eyes *et al* (1978) argue similarly and state that two-thirds of diagnostic radiological workload comes from casualty departments. They studied 504 patients who had skull x-rays after head injury. Demonstrable fractures were seen in 1.9 per cent and in only two cases did the radiographic findings (depressed fractures) initiate any active medical intervention. However, Jennett and Strang (1978) and Sarkies (1978) emphasise the importance of detecting a fracture, as a means of anticipating serious complications. Briggs and Potter (1978) give similar arguments for skull x-rays.

Medica-legal aspects

De Lacey (1979) found that five per cent of casualty x-rays were ordered for purely medico-legal reasons, i.e., the doctor feared litigation. This contrasted with other reports where requests for x-rays for purely medico-legal reasons amounted to 44 per cent of the total (Evans, 1977).

Jennett (1976) emphasised the importance of reading accurately the skull x-ray. He looked at 53 cases reported to the Medical Defence Union and Medical Protection Society of head injuries which later developed serious complications. Of these 53, 21 were sent home from an A & E department (16 of these died). In all 21, there was some abnormality about the skull x-rays. Therefore, if casualty officers are to send patients home, at least partly on the basis of the skull x-ray, the onus falls on them (and their teachers) to ensure they can detect fractures and gross abnormalities on the x-ray film.

Aspects of cost

Much has been written about the cost of skull x-rays in head injuries with reference to the low incidence of positive findings (Raison, 1976, Boulis et al, 1978, and Newman, 1977). However, the negative skull x-ray is important in helping the clinician decide which patients with head injury can be allowed to go home safely. The approximate cost for a skull series is £6.00 including the radiographer's and technician's time and the cost of the films (personal communication 1979). However, the cost of 24 hours in-patient care in a teaching hospital is approximately £65 (1979). Hence, the skull x-ray seems beneficial from both patient care and cost point of view.

RECOMMENDATIONS

In the light of our review of the literature, our indications for admission for patients with head injuries are shown in Table I.

TABLE I

Indication for admission of patients with acceleration/deceleration closed head injuries with a period of amnesia or unconsciousness.

1. All patients whose conscious state shows any impairment in the A & E department, or who have a post-traumatic amnesia of over one hour.
2. Marked headache or vomiting.
3. Abnormal neurological signs.
4. Skull fracture of vault, diagnosed by x-ray
   of base, diagnosed clinically
   (periorbital haematomas, CSF rhinorrhoea, ottorrhoea or retromastoid haematoma).
5. Patients whose head injury is combined with marked alcoholic intoxication, cerebrovascular accident, or other pathology.
6. If no responsible person is at home.
7. In children there should be a higher degree of suspicion and a greater readiness to admit.

An adult after a head injury can be discharged from an A & E department if the criteria outlined in Table II are fulfilled. The patient and accompanying friend or relative should be given written head injury instructions. These advise the relatives to speak to the patient at intervals of two or three hours over the first 24 hours, and to bring the patient back to hospital if his responsiveness deteriorates. Patients who are not being admitted should have x-rays taken, a PA and one lateral view. Those who are being admitted do not necessarily require x-rays.

TABLE II

Indications for allowing adult patients with head injury to go home

1. Fully conscious in the A & E department.
2. Symptom free.
3. No abnormal neurological signs.
4. No skull fracture.
5. There is a responsible person at home.
6. Post-traumatic amnesia of less than one hour.

Patients who are sent home should be recalled for review preferably within 24 hours to reassess the patient, to confirm that the amnesia was due to head injury and not to some other cause, to establish and record the length of retrograde and post-traumatic amnesia, and to commence a follow-up designed to reduce post-concussional symptoms to a minimum (Rutherford et al, 1979).

ACKNOWLEDGEMENTS

Our thanks are due to Miss Irwin for her help in calculating the cost of x-rays, to Mr. D. S. Gordon (Consultant Neurosurgeon, RVH) for his helpful criticism and comments and to Mrs. J. Armstrong for typing the manuscript.

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LONG TERM FOLLOW UP OF PATIENTS TREATED FOR HYPERTHYROIDISM WITH LOW DOSE RADIOACTIVE IODINE

by
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INTRODUCTION

RADIOACTIVE iodine (iodine-131) has been used extensively during the past 30 years for the treatment of hyperthyroidism and has been shown to control this disorder in the majority of cases in which it has been used. There have been varying reports of the incidence of post-radiation hypothyroidism which has been reported to be as high as 70 per cent in patients followed up for 10 years (Beling and Einhorn, 1961; Dunn and Chapman, 1964; Nofal, Beierwaltes and Patno, 1966; Green and Wilson, 1969). In recent years smaller doses of iodine-131 have been used to try to minimise this complication (Smith and Wilson, 1967; Hagen, Ouellette and Chapman, 1967; Hagen, 1968; Smith, Munro and Wilson, 1970, Blahd and Hays, 1972; Rapoport, Caplan and De Groot, 1975).

The experience of this unit with conventional doses of iodine-131 (using approximately 150 μCi per gram thyroid tissue) has been reported (Bhatia, Hadden, Montgomery and Weaver, 1968). Since then we have prescribed lower doses of approximately 70 μCi per gram of thyroid tissue, and from 1970 doses of approximately 35 μCi per gram. We have used these two doses rather than a dose calculated from neck uptake data. Furthermore, these doses could be given to outpatients without the need for inpatient supervision and disposal of excretory products.

The purpose of this paper is to report our experience using these smaller doses of radioactive iodine in the management of patients with hyperthyroidism.

PATIENTS AND METHODS

Patients were referred to the Metabolic Unit of the Royal Victoria Hospital from all parts of Northern Ireland between 1968 and 1973. The diagnosis of hyperthyroidism was made on the clinical findings and the standard biochemical tests then available (protein bound iodine, T_3 red cell uptake and serum cholesterol). Iodine-131 neck uptake studies were often performed for diagnostic purposes prior to therapy. The size of the thyroid gland was estimated by palpation. Iodine-131 was not given to patients under 40 years of age.

Before 1964, doses of iodine-131 calculated to deliver 6000 to 8000 rads to the thyroid, or 150 μCi per gram of thyroid tissue were used in the Metabolic Unit (Bhatia et al, 1968). Doses in the region of 8.5 mCi were used until 1964 when the

dose routinely used was reduced to about 5 mCi. From 1968 a standard dose of 2.5 mCi was given routinely to those patients where radioactive iodine was indicated. In 1970 a smaller standard dose of 1.25 mCi was introduced. From 1968 propranolol, 160 mg per day in divided doses, was given until the iodine-131 had taken effect (Hadden, Montgomery, Shanks and Weaver, 1968). Although a random allocation to treatment with 2.5 or 1.25 mCi was not followed, we do not believe that there was any real clinical or biochemical difference between the two groups (Tables 1 and 2). One hundred and seventeen patients received 2.5 mCi

Table 1

Comparison of ages and thyroid size in two dosage groups

		Mean age (years) ± SD	Mean thyroid size (g) ± SD
2.5 mCi doses	Patients remaining euthyroid (at least 5 years)	52.3 ± 10.7	33 ± 10
	Patients now hypothyroid	49.8 ± 8.7	30 ± 7
1.25 mCi doses	Patients remaining euthyroid (at least 5 years)	51.3 ± 8.4	32 ± 10
	Patients now hypothyroid	48.1 ± 10.3	35 ± 5

Table 2

Relative degree of thyroid overactivity at first treatment

	Euthyroid (at least 5 years)		*Now hypothyroid*	
	No. of patients	*Mean PBI ± SD*	*No. of patients*	*Mean PBI ± SD*
1.25 mCi doses				
Single dose	22	11.4 ± 2.4	2	11.8 ± 2.9
2 doses	10	11.7 ± 2.1	2	11.4 ± 1.8
3 doses	4	13.3 ± 2.2	1	10.0
2.5 mCi doses				
Single dose	24	11.7 ± 2.2	30	11.1 ± 2.5
2nd dose (1.25 mCi)	1	14.8	2	13.0
2nd dose (2.5 mCi)	8	9.9 ± 1.6	7	12.5 ± 0.9

iodine-131 and 77 of this group have been followed up for at least seven years. Seventy-one patients were treated with 1.25 mCi and 24 have been followed up for at least seven years. A number of patients treated with 2.5 mCi doses have been followed up for 10 years and a few of those treated with 1.25 mCi doses have been followed up for eight years, but the numbers become too small to make valid

comparisons. Patients remaining biochemically hyperthyroid after three to four months received a further dose of radioactive iodine and a number of patients required multiple doses (Tables 3 and 4).

Table 3

1.25 mCi doses (71 patients)

Total dose (mCi)	No. of patients treated	Per cent
Single dose 1.25	28	39.4
2 doses 2.5	17	23.9
3 doses 3.75	11	15.5
More than 3 doses (mean 7.4 ± 3.1)	15	21.1

Table 4

2.5 mCi doses (117 patients)

Total dose (mCi)	No. of patients treated	Per cent
Single dose 2.5	79	67.5
2 doses 3.75	3	2.6
2 doses 5.0	16	13.7
3 doses 6.25	2	1.7
3 doses 7.5	10	8.5
More than 3 doses (mean 12.1 ± 2.4)	7	6.0

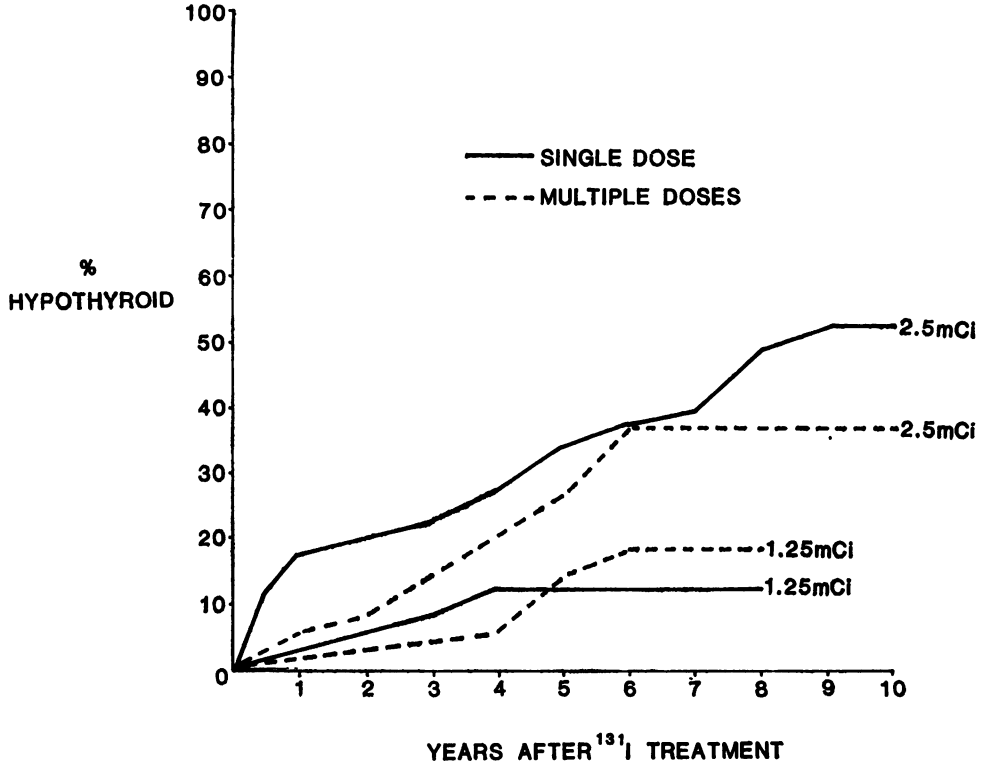

FIG. 1 Cumulative incidence of hypothyroidism followng 2.5 mCi and 1.25 mCi doses of iodine-131. Results of single and multiple doses shown separately.

The diagnosis of hypothyroidism was made on the clinical features together with a PBI of less than 3.5 μg/100 ml or T_3 red cell uptake of less than 10 per cent. In recent years serum T_4, T_3 and TSH values by radioimmuniassay have been in use and the diagnosis confirmed by low T_4 and T_3 levels with an elevated TSH. The cumulative incidence of hypothyroidism was calculated by the life-table method (Berkson and Gage, 1950; Cutler and Ederer, 1958) which provides a corrective factor for patients lost to follow up.

RESULTS

Figure 1 shows the results of the two dosage regimes. Because the number of patients followed up between eight and ten years are relatively small, a comparison of the incidence of hypothyroidism in the two groups has been made at seven years.

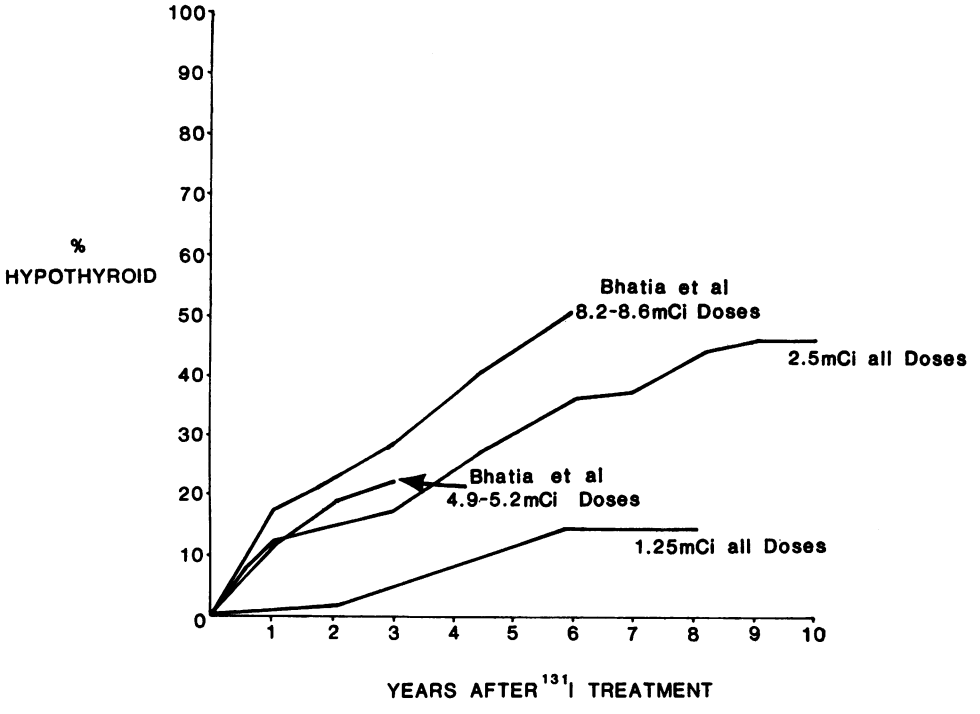

FIG. 2 Comparison of results with 2.5 mCi and 1.25 mCi doses of iodine-131 with results of Bhatia et al (1968).

Our experience with higher doses of iodine-131 (Bhatia et al, 1968) up to six years is shown for comparison (Fig 2).

At seven years 38.4 per cent of patients treated with a single dose of 2.5 mCi were hypothyroid, and of those followed up for ten years, 51.3 per cent were hypothyroid. Patients receiving multiple doses of 2.5 mCi (mean dose 6.9 ± 2.9) showed a cumulative incidence of hypothyroidism of 36.4 per cent at seven years, which did not increase at ten years.

At seven years 11.7 per cent of patients treated with a single dose of 1.25 mCi were hypothyroid, and of those patients followed up to eight years no more became hypothyroid. Hypothyroidism occurred in 17.4 per cent of those receiving multiple doses of 1.25 mCi (means 4.5 ± 2.8) and there was no increase at eight years.

The mean duration of biochemical hyperthyroidism following first treatment was 6.8 ± 7.7 months in the 2.5 mCi dose group and 8.5 ± 8.8 months in the 1.25 mCi dose group. Thirteen patients treated with 2.5 mCi doses were lost to follow up before five years and two patients died of causes unrelated to their hyperthyroidism. Five patients treated with 1.25 mCi doses were lost to review before five years and five patients died.

Two patients treated initially with 1.25 mCi remain on long term antithyroid drug treatment with carbimazole. One case was resistant to multiple doses totalling 15.0 mCi while the other case, treated with two doses of 1.25 mCi is now euthyroid. There were four cases of late relapse of hyperthyroidism (after three years) in the 1.25 mCi group. These patients were treated with further doses of iodine-131. One patient first treated with a 2.5 mCi of iodine-131 remains on carbimazole following relapse of hyperthyroidism at five years and multiple doses totalling 12.5 mCi. There was one other late relapse at six years in the 2.5 mCi group.

At the most recent review no patient remained hyperthyroid.

DISCUSSION

There is great variability in the reported incident of post-radiation hypothyroidism. The difficulties in analysing data which involves variations in length of follow up can be minimised by using the lifetable method. Glennon et al, 1972 have compared several previous studies using this method and their results are shown in Fig. 3.

Figures 1 and 2 show that the annual incidence of hypothyroidism can be substantially reduced by the use of lower doses of iodine-131. The difference in incidence of hypothyroidism between the two low dosage groups at seven years was significant ($p<0.05$), with the proviso that the statistics were done on retrospective data and the treatments were not strictly randomised. No statistics were possible on the data of Bhatia et al for comparison. The argument against low dose iodine-131 therapy is that patients may remain hyperthyroid longer until the iodine-131 has taken effect, and that the patients will be subjected to repeated treatments and frequent attendance at outpatient clinics. However, the mean period of biochemical hyperthyroidism did not differ greatly in the two dosage groups studied, although the number of retreatments was greater in the 1.25 mCi dose group.

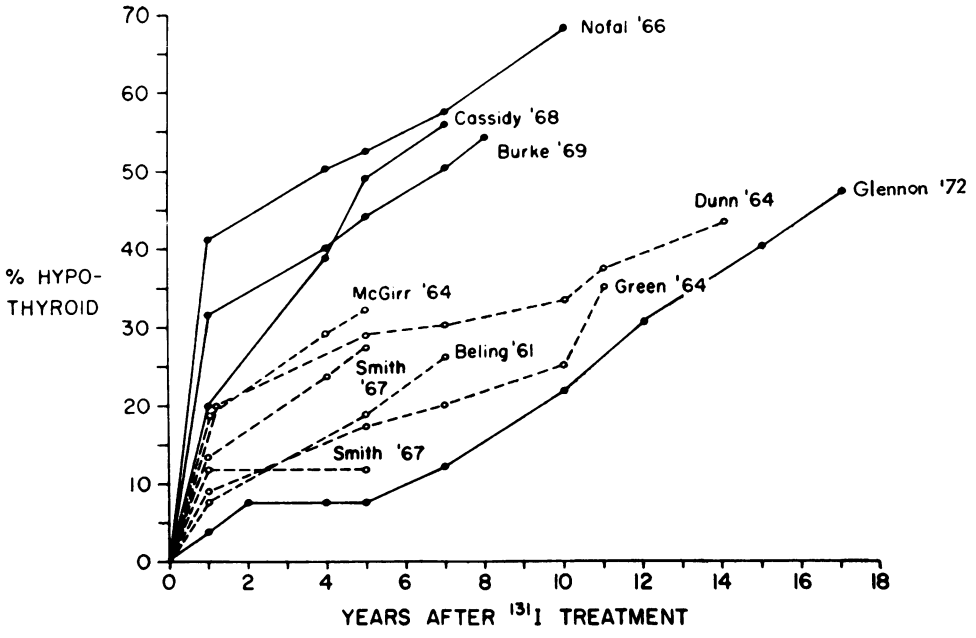

FIG. 3 Taken from Glennon et al (1972). Solid lines indicate data originally reported using the life-table method; broken lines indicate data recalculated from the reported data using the life-table method.

Individual sensitivity to radioiodine is a possible factor in the development of hypothyroidism. No difference in age or size of the thyroid was observed in those patients requiring multiple doses nor was there any apparent difference in the degree of thyroid overactivity at first treatment in patients requiring single or multiple doses, or in those becoming hypothyroid.

These findings differ from the recent reports from the USA of a six year incident of hypothyroidism of 10 to 25 per cent following doses of 3 to 4 mCi (Cevallos et al, 1974; Glennon et al, 1972). It may be that the natural history of hyperthyroidism differs in different communities and that autoimmunity may be a factor in the ultimate development of hypothyroidism in patients treated with iodine-131.

Our policy of restricting iodine-131 treatment to patients over the age of 40 years may have contributed to the apparent high incidence of hypothyroidism at review compared with the results of American workers. Green and Wilson (1964) reported a lower incident of hypothyroidism in patients under 40 years of age, but attributed this to a larger thyroid gland in those younger patients treated. Bhatia et al (1968) found a higher incidence of hypothyroidism in patients aged 40 to 49 years compared with patients over 60. No definite trend was observed in the present series.

We have shown a difference in the results of treatment with two low dose regimens and compared this with our previous experience of more conventional doses of iodine-131 in this community. The lower incident of permanent hypothyroidism is offset by the need for repeated treatments in the 1.25 mCi group. As our patients are kept under regular review, it may be better to accept a higher rate of hypothyroidism, as this can be easily treated, and avoid frequent retreatments. Accordingly, we continue to use 2.5 mCi as a routine dose and retain the lower dose for milder cases.

SUMMARY

The cumulative incidence of hypothyroidism after therapeutic radioiodine for hyperthyroidism in patients over 40 years was 38 per cent seven years after a single dose of 2.5 mCi iodine-131, and 12 per cent seven years after a single dose of 1.25 mCi.

Thirty-three per cent of patients treated with 2.5 mCi required further doses, compared to 60 per cent of patients treated with 1.25 mCi. Where close supervision and outpatient follow up can be attained, the use of low dose radioiodine therapy can result in a much lower incidence of post-radiation hypothyroidism.

ACKNOWLEDGMENTS

We would like to thank Mr. D. W. Neill, Department of Biochemistry, Royal Victoria Hospital, and Dr. T. K. Bell, Department of Medical Physics, Royal Victoria Hospital, for biochemical and radioisotope studies on the patients; Dr. J. D. Merrett, Department of Medical Statistics, Queen's University, Belfast, for advice on the statistical methods; Sister M. Murphy and her Staff at Metabolic Extern, and Mrs. Bridget Briggs for typing the manuscript.

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GASTROINTESTINAL ENDOSCOPY. AN INTRODUCTION FOR ASSISTANTS. D. Hollanders. (Pp 168; figs 49. £4.75). London: Bailliere Tindall, 1979.

IT is now over forty years since Mr. Harold W. Rogers, assisted by Dr. Francis Avery Jones, passed the first semiflexible gastroscope at St. Bartholomew's Hospital. Today fibre-optic endoscopy plays a key role in the investigation and management of digestive disease.

The instrumentation is now widely available and if it is to continue to be widely available as resources contract emphasis must be placed on careful handling of the equipment by well-informed assistants and endoscopists.

There are now many texts dealing with the techniques and interpretation of gastrointestinal endoscopic procedures but few are of practical value to the nurse or radiographer designated to assist in their performance. This small text fills a gap in the British Literature by giving all of the necessary informttion with which an assistant should be familiar. Subjects such as physical principles, equipment design and medication for endoscopy are well presented without too much technical detail.

The most useful chapters deal with the assistant's role both in the care of the patient and in the care of the equipment. Since these instruments are both fragile and expensive care to detail in their cleaning and handling is essential if expensive repairs and shortened instrument life are to be avoided. This book should be available in endoscopy units as an introduction for the trainee endoscopist and trainee assistant alike.

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R.J.McF.

COMPARISON OF PROPRANOLOL AND INDERAL L.A. IN PATIENTS WITH ANGINA

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SUMMARY

TWELVE patients with moderately severe angina pectoris completed a double blind cross-over comparison of conventional propranolol (40 mg q.i.d.) and Inderal L.A. (160 mg once daily) with regard to therapeutic effectiveness, blood levels, compliance and patient acceptability.

Exercise tolerance was assessed using standardised treadmill testing at 1, 2, 4, 8, 12 and 24 hours after the morning dose. The double placebo technique was used.

Patient compliance was excellent for both regimes and no serious side effects were reported. No significant differences in exercise tolerance or blood levels were observed between the two treatments at any time.

INTRODUCTION

The therapeutic effectiveness of propranolol in angina pectoris is well documented (Miller *et al,* 1975). The plasma half-life is 4-6 hours (Chidsey *et al,* 1975; McAinsh *et al,* 1978) and is usually administered 2-4 times daily. A long acting formulation (Inderal L.A. ICI) has been developed. Preliminary studies indicate that in healthy volunteers, Inderal L.A. given once daily produces blood levels comparable to those obtained by giving conventional propranolol 4 times daily in the same total dosage (Leahey *et al,* 1979). We compared conventional propranolol (40 mg q.i.d.) with once daily Inderal L.A. (160 mg) with regard to therapeutic effectiveness, blood levels, compliance and patient acceptability.

PATIENT SELECTION

Men aged under 70 years attending the cardiology clinic with angina pectoris were considered for the study. Those with overt heart failure, airways obstruction, heart block, unstable angina or evidence of myocardial infarction within six months were excluded. None was receiving digitalis preparations or anti-hypertensive drugs. Patients taking propranolol 40 mg q.i.d. for at least one month were tested on a treadmill linked to an Avionics stress monitor by the CM5 lead system (Sheffield and Roitman, 1976) Thirteen patients who could complete one but not three full stages of the Bruce protocol were studied. Informed consent was obtained.

METHOD

Each patient completed two weeks run-in followed by two 2-week study periods. During the run-in, patients continued to take conventional propranolol (40 mg q.i.d.). Before starting the treatment periods, six treadmill tests were performed 1, 2, 4, 8, 12 and 24 hours after the morning tablet. Resting heart rate, ST segment displacement and blood pressure were measured. They then walked at a constant 2.5 m.p.h. up a 12 per cent gradient. At the onset of pain, heart rate and ST segment displacement were recorded, blood pressure was measured and the treadmill stopped.

The patients were allocated randomly for two weeks treatment with propranolol tablets (40 mg q.i.d.) or Inderal L.A. 160 mg once daily. The treatments were then crossed over. The double placebo technique was used. Two weeks supply of one capsule daily (9 am) and one tablet q.i.d. (9 am, 1 pm, 5 pm and 9 pm) respectively was provided. Fifty trinitrin tablets were given, to be used only to relieve pain. After each treatment period tablet counts were performed. Diary cards were used to record the number and severity of anginal attacks, the number of trinitrin tablets consumed, subjective sense of well being and level of activity. The patients were seen weekly. Following each treatment period standardised treadmill tests were performed as before. Blood samples were taken following exercise. Plasma propranolol levels were measured by the fluorometric method (Shand *et al,* 1970). An analysis of variance was performed to compare differences between treatments.

RESULTS

One patient withdrew after the first study week because of epigastric burning attributed to the capsule, identified subsequently as placebo. Twelve completed the study. Their mean age was 54 years (range 43-57) and the mean duration of angina was 60.1 months.

Patient compliance as estimated by tablet count was excellent. Ninety eight per cent of the propranolol tablets and all of the Inderal L.A. capsules were taken. The number and severity of anginal attacks were similar in the two treatment periods. There were no statistically significant differences in patients' trinitrin consumption, subjective sense of well being or activity level between the two study periods. The mean observations and standard errors of heart rate, blood pressure and S.T. segment levels at each test are shown in Table 1 and Table 2.

Mean resting systolic and diastolic blood pressures were significantly lower at one hour while taking propranolol. Mean heart rate at the onset of pain was significantly lower at one hour and two hours while taking propranolol. No other statistically significant differences were observed.

The mean duration of exercise performed at each test for both regimes is shown in Figure 1 and Table 3. There was a slight improvement in exercise

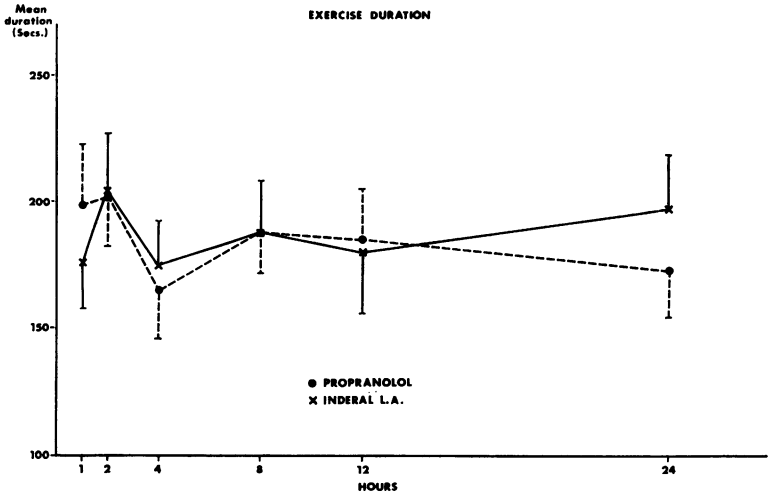

FIG. 1 Duration of exercise before symptoms in patients at various intervals after receiving propranolol or Inderal LA.

tolerance with both drugs between one and two hours but no significant difference in exercise ability was observed between the two treatments at any time.

The mean blood levels are shown in Figure 2 and Table 3. There were no statistically significant differences at any time.

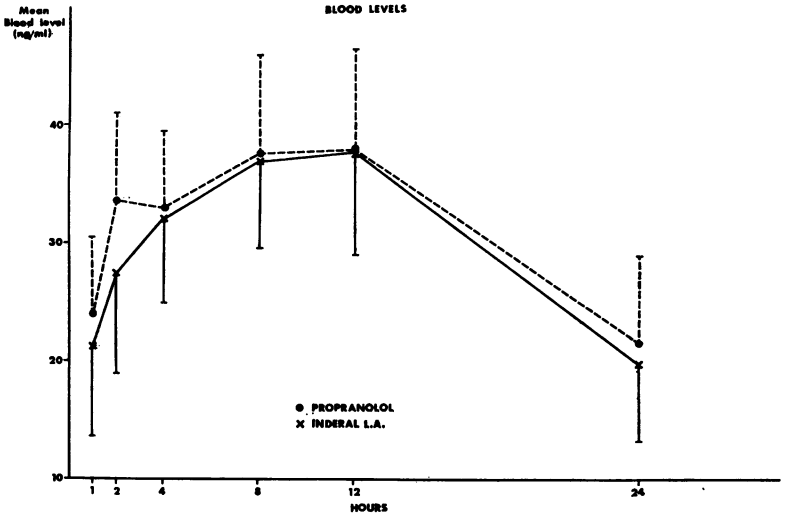

FIG. 2 Blood levels of propranolol and Inderal LA at intervals after administration.

TABLE 1

Resting Values of heart rate blood pressure and ST segment at various intervals after propranolol (Prop.) or Inderal L.A. (L.A.)

	INTERVAL AFTER ADMINISTRATION					
	1 hour	2 hours	4 hours	8 hours	12 hours	24 hours
Heart Rate (per minute)						
Prop.	57± 1.7	56± 1.6	60± 2.0	54± 2.2	58± 2.5	59± 1.8
L.A.	58± 1.7	55± 2.5	59± 1.8	55± 1.8	58± 2.4	59± 2.1
Systolic B.P. (mm Hg)						
Prop.	110± 3*	109± 8	112± 4	114± 4	124± 5	116± 4
L.A.	122± 2*	116± 4	111± 4	112± 4	119± 4	121± 5
Diastolic B.P. (mm Hg)						
Prop.	64± 2.8†	67± 2.7	61± 3.1	69± 3.4	70± 2.9	68± 2.4
L.A.	73± 2.0†	68± 3.5	63± 2.2	70± 2.1	69± 2.5	72± 3.1
S.T. Segment Depression (mm)						
Prop.	0.6± 0.2	0.5± 0.2	0.5± 0.1	0.6± 0.1	0.5± 0.1	0.6± 0.2
L.A.	0.5± 0.2	0.5± 0.2	0.4± 0.1	0.5± 0.1	0.5± 0.1	0.6± 0.2

† $P<0.01$ * $P<0.05$ Other results not significantly different.

TABLE 2

Values of heart rate blood pressure and ST segment at the onset of pain at various intervals after propranolol (Prop.) and Inderal L.A. (L.A.)

	INTERVAL AFTER ADMINISTRATION					
	1 hour	2 hours	4 hours	8 hours	12 hours	24 hours
Heart Rate (per minute)						
Prop.	96± 2.9†	92± 2.6*	98± 2.6	94± 2.4	96± 2.8	99± 3.3
L.A.	100± 3.1†	94± 2.9*	96± 3.1	93± 2.8	97± 3.0	96± 3.8

Systolic B.P. (mm Hg)						
Prop.	134± 4	131± 5	130± 5	136± 6	132± 6	136± 5
L.A.	139± 5	135± 5	137± 7	136± 5	137± 4	137± 4
Diastolic B.P. (mm Hg)						
Prop.	82± 2.9	85± 2.5	81± 3.6	79± 3.1	83± 4.2	86± 3.5
L.A.	83± 2.3	80± 2.9	81± 2.4	81± 2.5	83± 2.3	85± 3.4
ST Segment Depression (mm)						
Prop.	1.3± 0.3	1.2± 0.2	1.3± 0.2	1.4± 0.2	1.3± 0.2	1.5± 0.3
L.A.	1.6± 0.3	1.2± 0.3	1.3± 0.3	1.4± 0.3	1.4± 0.3	1.4± 0.3

† $P<0.01$ * $P<0.05$ Other results not significantly different.

TABLE 3

Exercise duration and plasma propranolol concentration at various intervals after propranolol (Prop.) and Inderal L.A. (L.A.)

	INTERVAL AFTER ADMINISTRATION					
	1 hour	2 hours	4 hours	8 hours	12 hours	24 hours
Exercise Duration (seconds)						
Prop.	199± 24	202± 19	165± 19	188± 16	185± 20	173± 18
L.A.	176± 18	204± 22	175± 17	188± 20	180± 24	197± 21
Plasma Concentration (ng/ml)						
Prop.	24.1± 6.5	33.6± 7.4	33.0± 6.4	37.6± 8.2	37.9± 8.5	21.8± 7.2
L.A.	21.2± 7.5	27.5± 8.5	32.1± 7.1	37.0± 7.3	37.8± 8.6	20.0± 6.7

No significant differences present.

Side effects were few and mild in both treatments. Apart from the patient who withdrew while taking the placebo capsule, only one patient had a complaint, fatigue while taking propranolol.

DISCUSSION AND CONCLUSIONS

This study has shown that in chronic dosage patients with angina achieved comparable plasma propranolol levels and had comparable exercise tolerance throughout the 24 hours after a single morning capsule of Inderal L.A. (160 mg) and after conventional propranolol 40 mg q.i.d. These findings support the kinetic studies on healthy volunteers (Leahey *et al,* 1979).

No important differences in blood levels or recorded clinical parameters were observed.

The excellent compliance on both regimes may be attributable to very close supervision and the patients' enthusiastic co-operation.

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HYPERPROLACTINAEMIA — INVESTIGATION AND RESULTS OF TREATMENT

by

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INTRODUCTION

HUMAN prolactin was isolated in 1971 (Lewis, Singh and Seavey) and this was soon followed by the development of a homologous radioimmunoassay for its measurement in plasma (Friesen, Hwang, Guyda, et al 1973). Many studies have been carried out on patients with pathological conditions where basal plasma prolactin levels are elevated (Edwards, Forsyth and Besser, 1971; Turkington, 1972; Franks, Murray, Jequier, et al, 1975; Ramirez, O'Neill, Bloomer and Jubiz, 1977). The most important clinical application of these studies has been the measurement of plasma prolactin in patients with secondary amenorrhoea. With the advent of prolactin-lowering drugs such as bromocriptine and the development of the transsphenoidal approach to hypophysectomy, it has been possible to treat these patients successfully (Lutterbeck, Pryor, Varga and Wenner, 1971; Hardy, 1971). This paper describes the results of investigation and management of 53 patients with hyperprolactinaemia seen in the Gynaecology/Endocrine Clinic of the Royal Victoria Hospital, Belfast.

PATIENTS AND METHODS

Basal plasma levels of prolactin, luteinizing hormone (LH), follicle stimulating hormone (FSH), 17-β oestradiol, progesterone and testosterone were measured in 220 patients who presented with menstrual abnormalties or infertility and with hirsutism in a few. Thyroid function and a random plasma cortisol were also measured. The blood samples were obtained between 10.00 and 12.00 hours and were taken at least 30 minutes after each patient had been examined. Those who were discovered to have elevated plasma prolactin levels were recalled and had three consecutive blood samples taken at 30 minute intervals. The mean of these samples was then taken at the basal plasma prolactin level. Elevated prolactin levels were found in 42 of the 220 women. Eleven patients who were referred with confirmed hyperprolactinaemia were similarly investigated. Forty of the resulting 53 patients with hyperprolactinaemia also had a combined pituitary function test performed (insulin 0.2 iu/kg bodyweight, gonadotrophin releasing hormone (GnRH) 100 μg and thyrotrophin releasing hormone (TRH) 200 μg intravenously). The plasma prolactin response during a 24 hour period following 2.5 mg bromocriptine orally was also measured in these 40 patients. Visual field assessment was performed in all the patients with hyperprolactinaemia using a Tübinger perimeter. Lateral skull X-rays were taken in all patients and 48 had hypocycloidal polytomography of the pituitary fossa carried out in the lateral

projection. The X-rays were considered independently by three radiologists. They were assessed subjectively as it has been suggested that the estimation of an erperienced radiologist is superior to available methods of quantitative evaluation (Steinbach, Feldman and Goldberg, 1959). The X-rays were considered to be abnormal if there was an increase in sellar size, evidence of sellar asymmetry, a double contour of the sellar outline, thinning of the bony contour of the sella or localised erosion of the sellar floor. In cases where the radiologists did not agree the X-rays were considered jointly, and if no agreement was then reached, they were classified as equivocal. Patients with abnormal X-rays who wished to conceive had air encephalography carried out to exclude suprasellar extension of the pituitary lesion. Twenty-five patients had computerised axial tomography of the pituitary fossa carried out in the transverse plane using an EMI-5005 scanner. This examination was performed before and after intravenous injection of 50 ml (65 per cent) meglumine diatrizoate containing 306 mg iodine per ml.

ASSAY METHODS

Plasma prolactin was measured by radioimmunossay using ^{125} I labelled human prolactin (standard — Medical Research Council Standard A, preparation 71/222, obtained from the National Institute of Biological Standards and Control; prolactin for labelling supplied by the National Institute of Arthritis, Metabolism and Digestive Diseases, National Institutes of Health, Bethesda, USA; antibody supplied by the Tenovus Institute for Cancer Research, Cardiff (Reagent Code 7110)). This antibody displays minimal cross reactivity with human growth hormone, luteinizing hormone (LH), follicle stimulating hormone (FSH) and thyroid stimulating hormone (TSH). The within-assay coefficient variation was 3.9 per cent at a plasma prolactin concentration of 400 mU/1. The between-assay coefficient variation was 7.9 per cent at this plasma concentration. The plasma samples were assayed in duplicate and the upper limit of the normal range of plasma prolactin in women aged 18-30 years was founnd to be 400 mU/1. Plasma levels of LH, FSH, 17-β oestradiol, progesterone, testosterone, human growth hormone (HGH), TSH, thyroxine and triiodothyronine were all measured by radioimmunoassay (Wilson, 1979). Cortisol was measured by the Mattingly fluorometric technique (1962) and plasma glucose was measured on an auto-analyser by the glucose oxidase technique (Technicon).

A combined pituitary function test was carried out as described by Harsoulis, Marshall, Kuku et al (1973). The responses of LH, FSH and TSH were taken as the mean increase in hormone levels above the basal level 20 and 60 minutes after the beginning of the test. The responses of growth hormone and cortisol were assessed by the peak hormone level achieved during the test and the degree of hypoglycaemia produced by insulin was shown by the lowest plasma glucose level recorded during the test. The plasma prolactin response to the stimulation test was assessed by the maximum increase in plasma prolactin levels expressed as a percentage of the basal level and the plasma prolactin response to the bromocriptine inhibition test was taken as the maximum decrease, expressed as a percentage of basal level. The results of the stimulation test were compared with

those obtained in 11 healthy female volunteers (aged 18-32 years) during the mid-follicular phase of the menstrual cycle and were analysed using the Mann-Whitney U test.

RESULTS

Basal plasma prolactin levels in the 53 patients with hyperprolactinaemia are shown in Figure 1. The highest basal plasma prolactin levels occurred in 36 patients with amenorrhoea (range 1,000-31,500 mU/1) and the lowest levels in the 10 patients with regular menstrual cycles (range 500-2,800 mU/1). However, there was a considerable overlap between the three subgroups. One patient was taking thioridazine. None of the others was on any medication known to influence plasma prolactin levels. All were euthyroid and none had evidence of renal disease.

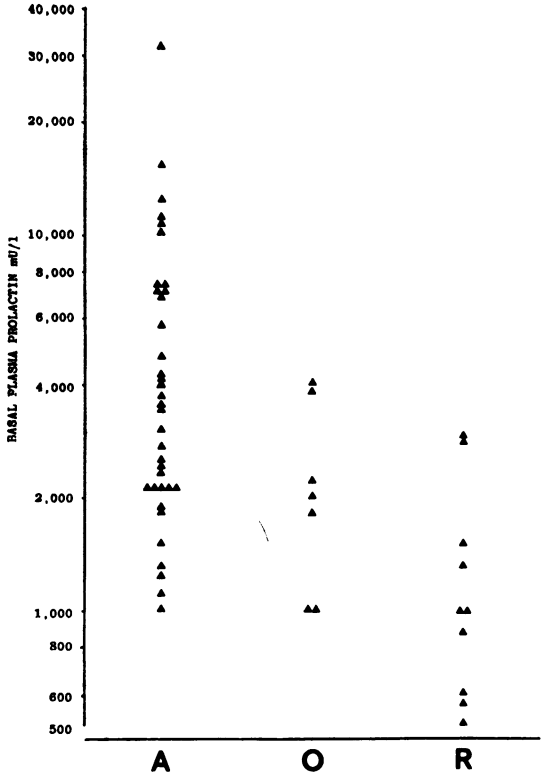

FIG. 1 Basal plasma prolactin levels in 53 hyperprolactinaemic women with amenorrhoea (A), oligomenorrhoea (O) and regular menses (R) (upper limit of normal 400 mU/1).

Two patients had had previous neurosurgery: one had had a transfrontal hypophysectomy for a pituitary chromophobe adenoma and the other had had a craniopharyngioma aspirated. Both were on replacement therapy with thyroxine and cortisone acetate. Eight patients were referred with hyperprolactinaemia fol-

lowing discontinuation of oral contraceptives and in another seven symptoms developed following delivery. In one patient symptoms developed after she sustained a head injury in a road traffic accident. Four patients had been treated with chlomiphene citrate without success but eight others had menstruated while on treatment with this drug. Three of these patients had had successful pregnancies following treatment with chlomiphene citrate and human chorionic gonadotrophin. One patient had had a pregnancy following treatment with follicle stimulating hormone, luteinizing hormone and human chorionic gonadotrophin. Polycystic ovaries had been noted in four patients and bilateral wedge resection of ovaries had been carried out without restoration of ovulation in all four of them.

Patients were considered to have galactorrhoea if they had a history of abnormal lactation or if this could be demonstrated on examination. Twenty of the 36 patients with amenorrhoea, two of the seven patients with oligomenorrhoea and one of the 10 patients with regular menses had galactorrhoea.

Visual fields were assessed clinically in all the patients and were documented using a Tübinger perimeter. None of the patients had any evidence of temporal field loss suggestive of pressure on the optic chiasma.

X-rays of the pituitary fossa were abnormal in 19 of the 48 patients who had hypocycloidal polytomography performed. In 23 patients they were normal and in the remaining six patients the appearances were equivocal. Basal plasma prolactin levels were highest in the patients with abnormal fossae (range 2,100-31, 500mU/1) and the lowest in the patients with normal fossae (range 500-1,500 mU/1) but again there was considerable overlap between the subgroups. Of the 25 patients in whom CT-scans were carried out nine had normal plain X-rays and these nine had all normal CT-scans. The three patients who had equivocal plain X-rays all had normal CT-scans and of the 13 patients with abnormal plain X-rays, 10 had normal and only three had abnormal CT-scans.

Basal levels of TSH, thyroxine and tri-iodothyronine were similar to those in normal females of the same age as were the basal plasma levels of LH, FSH, progesterone and testosterone. The basal plasma levels of 17-β oestradiol in the hyperprolactinaemic patients with amenorrhoea were compared with those in normoprolactinaemic patients of the same age who had amenorrhoea of pituitary or hypothalamic origin. The mean oestradiol level in the hyperprolactinaemic patients (190 $\pm$ 20 pmol/l) was found to be significantly lower ($p<0.05$) than in the normoprolactinaemic patients (260 $\pm$ 20 pmol/l). It was also found that there was a significant correlation between basal plasma prolactin level and 17-β oestradiol level in these patients when the results were analysed by non-parametric tests using Kendall's rank correlation coefficient ($Tau=0.31$; $p>0.01$).

The TSH, LH, FSH, growth hormone, cortisol responses to the stimulation test are shown in Table 1. As none of the patients had adrenal disease the cortisol response was taken to reflect ACTH release by the pituitary to this test. The plasma prolactin response was diminished in all patients compared with control subjects. The response to the bromocriptine inhibition test was a similar in all the patients and showed a fall in plasma prolactin of 80 $\pm$ 5 per cent.

TABLE 1

Results of pituitary tests in 40 hyperprolactinaemic women

	HORMONE RESPONSE		
	EXAGGERATED	NORMAL	IMPAIRED
TSH	5	35	0
LH	6	30	4
FSH	24	15	1
HGH	—	36	4
CORTISOL	—	40	0

Twenty-three of the patients were treated with bromocriptine. Two had transsphenoidal hypophysectomies and 20 remain under observation without any treatment. The remaining eight patients returned to their referring gynaecologists for treatment after initial investigations had been completed. Plasma prolactin levels were restored to normal in 20 of the 23 patients treated with bromocriptine. Two of the remaining three patients defaulted from the clinic before they had been adequately treated. In the third patient plasma prolactin levels remained elevated despite increasing the dose of bromocriptine to 45 mg per day. In the amenorrhoeic patients menses were restored in 18 to 78 (mean 40) days after starting treatment. Ovulatory menstrual cycles as shown by a biphasic temperature record and an elevation of plasma progesterone during the second half of the cycle were established on a dose of bromocriptine of 5 to 10 mg per day. Relief of galactorrhoea was experienced within six weeks in all who had this symptom at the onset of treatment.

Details of eight patients who conceived are shown in Table 2. All patients were required to undertake barrier contraceptive measures until three menstrual cycles had been completed. Contraceptive measures were then discontinued and they were allowed to attempt to conceive. The absence of a predicted menstrual period and the continued elevation of basal body temperature suggested the possibility of pregnancy. When this was confirmed treatment with bromocriptine was discontinued. After delivery all patients who attempted to breast feed succeeded in doing so. Plasma prolactin levels remained elevated post partum in all the patients but despite this one had spontaneous return of menses. All patients with an equivocal or abnormal pituitary fossa before pregnancy were re-Xrayed after delivery. No changes were seen in the radiological appearances of the pituitary fossae of any of them.

Two patients were selected for treatment by transsphenoidal hypophysectomy. Both had evidence of suprasellar extension of the pituitary on air encephalography. Pituitary function tests carried out before and after surgery showed no impair-

TABLE 2

Clinical details of eight hyperprolactinaemic women who conceived on bromocriptine treatment

Patient	Age (years)	Menstrual History	Pituitary Fossa	Plasma Prolactin (mU/l)		Bromocriptine Dose (mg/day)	Total length of Treatment (weeks)	Menstrual Cycles from stopping contraception to conception	Outcome of Pregnancy and Birth Weight (Grammes)
				Before Treatment	During Treatment				
1	30	A + G	Abnormal	15300	120	5	20	2	Female 4000
2	33	A + G	Normal	3000	68	5	20	2	Male 2860
3	29	A + G	Normal	1500	129	5	18	1	Female 2295
4	29	A + G	Normal	2500	140	5	14	1	Male 3500
5	39	A + G	Equivocal	1300	180	5	36	4	Female 3065
6	35	O	Normal	2000	60	5	40	11	Male 3340
7	25	O + G	Equivocal	3700	100	5	18	1	Male 3520
8	28	O + G	Normal	1800	92	10	64	12	30 weeks pregnant

A - amenorrhoea O - oligomenorrhoea G - galactorrhoea

ment following surgery. In the first patient plasma prolactin levels fell to normal 24 hours after surgery (Figure 2) and menses resumed 28 days after a lapse of six years. She conceived seven months after surgery and delivered a full term 3,500g baby girl. In the second patient the plasma prolactin levels did not return to normal after surgery and she continued to have amenorrhoea and galactorrhoea. She was started on bromocriptine and menses were established. Three months later she conceived but aborted after eight weeks. She was restarted on bromocriptine and is now 20 weeks pregnant.

Twenty patients have received no treatment and eleven remain unchanged. One patient resumed normal menses without any treatment although her plasma prolactin levels are still elevated. Two patients with secondary amenorrhoea and elevated plasma prolactin levels became pregnant without treatment and without developing any menses. Both successfully completed uneventful pregnancies.

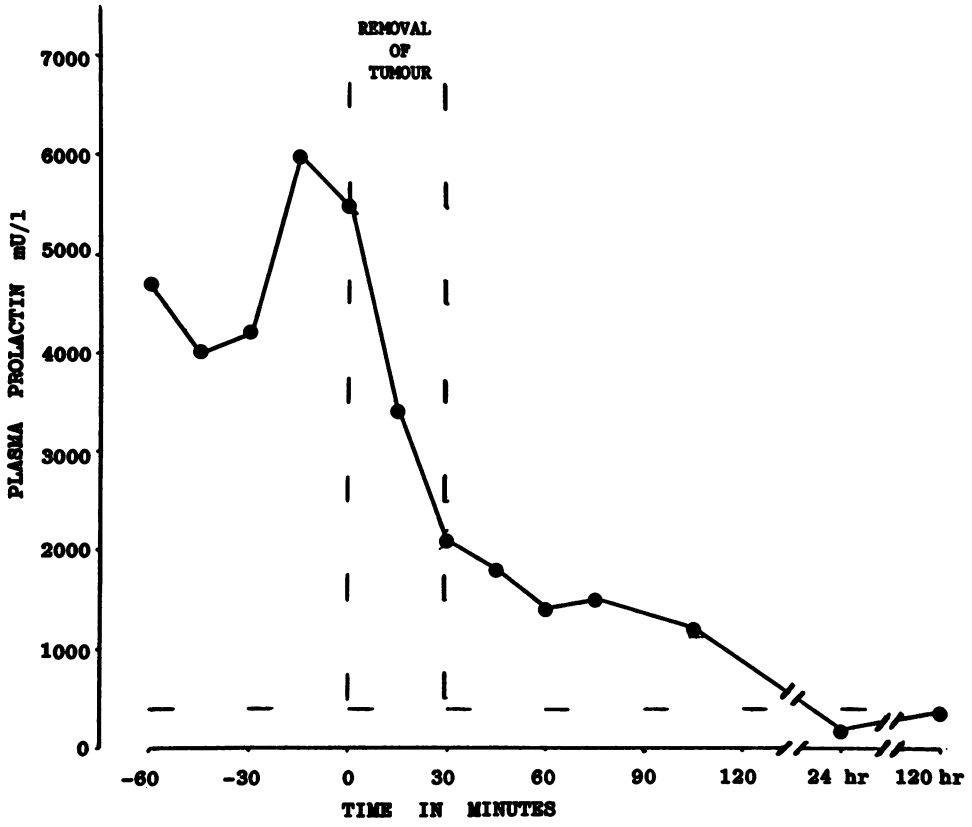

FIG. 2 Plasma prolactin levels following transsphenoidal partial hypophysectomy in one patient.

DISCUSSION

The incidence of hyperprolactinaemia in the patients studied here was 19 per cent and was 28 per cent in the patients with amenorrhoea. This compares with a reported incident of 13.4 to 39 per cent (Bohnet, Dahlen, Wuttke and Schneider, 1975; Franks Murray, Jequier et al, 1975; Glass, Williams, Butt et al, 1976; Bergh, Nillius and Wide, 1977; Pepperell, Bright and Smith, 1977; Seppälä, Lehtovirta and Ranta, 1977; Shearman and Frazer, 1977). The variation in incidence in the reported series is likely to be due to differences in patient groups and to reflect the different pattern of patient referral to each centre. The incidence of galactorrhoea in the patients studied here was 38 per cent and is similar to that reported by others (Bohnet et al, 1975; Franks et al, 1975; Seppälä et al, 1977). It is considerably lower than that reported by Glass et al (1976), Thorner and Besser (1977), Bergh, Nillius and Wide (1977) and Pepperell, Bright and Smith (1977), all of whom reported an incidence of galactorrhoea of approximately 80 per cent cent. Differences are probably due to definitions of what constitutes galactorrhoea and differences in examination technique.

Eight patients were referred with hyperprolactinaemia after discontinuation of oral contraceptives. It is not certain whether the use of these drugs predisposes to the development of hyperprolactinaemia and it should be noted that some of the patients had abnormal menses before starting on oral contraceptives. However, it has been suggested that longterm use of oral contraceptives can result in stimulation of otherwise silent pituitary tumours and lead to hyperprolactinaemia (Sherman and Korenman, 1978). Polycystic ovaries were documented in four patients studied here. This finding has been noted by others (Thorner, McNeilly, Hagan and Besser, 1974, Sepälä and Hirvonen, 1975) and it has been suggested that it may be related to elevated androgen levels in some of these patients. However, only two of the patients studied here had elevated testosterone levels and only one of them had evidence of polycystic ovaries.

The finding that 17-β oestradiol levels in hyperprolactinaemic patients with amenorrhoea were lower than those in similar normoprolactinaemic patients and the finding of a significant negative correlation between basal plasma prolactin and 17-β oestradiol levels would support the hypothesis that there is a direct and dose related action of prolactin on the ovary. These findings are similar to those of Franks and Jacobs (1977) and Reyes, Gomez and Fairman (1977) but are at variance with those of Bergh, Nillius and Wide (1977).

Tests of pituitary function performed in 40 patients showed no consistent pattern. There was an exaggerated TSH response to TRH in five patients. This is similar to the findings of Thorner and Besser (1977) and it has been suggested that it is due to functional dopamine deficiency at the pituitary or hypothalamic level (Besses, Burrow, Spaulding and Donabedian, 1975). The gonadotrophin response to GnRH was very variable being exaggerated in some patients and impaired in a few with very large pituitary tumours. Growth hormone response to hypoglycaemia was also impaired in four with large pituitary tumours. The cortisol response was normal and the prolactin response was impaired in all the patients. Although these tests are useful for assessing pituitary function, the responses are so variable that it is not possible to use them to distinguish patients with pituitary tumours from patients with hyperprolactinaemia due to other causes. Muller, Genazzani, Camanni et al (1978) described a test using nomiphensine which is the only test that is claimed to be able to distinguish between hyperprolactinaemic patients with and without pituitary tumours.

None of the patients studied here had visual field defects due to pressure effects on the visual pathways. This finding is similar to that of Kase, Andriole and Sobrinho (1973) and Jones and Kemmann (1976). It is not surprising as most patients with hyperprolactinaemia do not have large pituitary tumours. In this series 19 of the 48 patients who were fully investigated radiologically were considered to have abnormal pituitary fossae but only six had gross changes compatible with the presence of a large pituitary adenoma. The remainder had changes compatible with the presence of a pituitary microadenoma. The importance of carrying out polytomography in these patients was stressed by Vezina and Sutton (1974). They found a sella of normal size in 14 out of 20 patients who subsequently were shown to have abnormalities on tomography

compatible with the presence of a small pituitary adenoma. Transsphenoidal surgery later confirmed the presence of a tumour in each case.

Computerised transverse axial tomography was performed in 25 patients in this series. It was found to be of no value in confirming the presence of an intrasellar tumour or in excluding suprasellar extension of the pituitary. Part of the difficulty was due to the fact that the X-ray beam width in the scanner used was 13 mm but it is hoped that narrowing this beam width and introducing special computer procedures to obtain coronal and sagittal views of the skull will help to improve the diagnostic value of this procedure. At present air encephalography and metrizamide cisternography are the only reliable methods of excluding suprasellar extension of the pituitary. This is of primary importance for selection of appropriate treatment for the patient with hyperprolactinaemia.

Twenty-three of the patients in this series were treated with the dopamine-agonist bromocriptine. Those who wished to become pregnant were only treated after suprasellar extension of the pituitary had been ruled out (see below). Patients who did not wish to conceive but who were known to have enlargement of the pituitary fossa were only treated after they had been fully informed of possible complications of an unplanned pregnancy and had agreed to undertake barrier contraception if appropriate. Treatment proved to be highly successful in all but one patient in whom plasma prolactin levels were not restored to normal even on 45 mg bromocriptine per day. This woman had normal growth hormone and cortisol responses to hypogycaemia, a normal TSH response to TRH and exaggerated LH and FSH responses to GnRH. At follow up she was reassessed and as the radiological appearance of the pituitary fossa was then considered to be abnormal, she was offered a transsphenoidal hypophysectomy which she declined.

All the eight patients who wished to conceive succeeded in doing so. There are two major concerns about treating these patients with bromocriptine. The first is the possibility of teratogenic effects of this drug and in order to reduce this the drug was stopped as soon as the pregnancy was confirmed. However, the patients had all conceived at least four weeks earlier and the fetus had been exposed to bromocriptine during that time. Despite this none of the children born to the mothers was found to have any congenital abnormality. Griffith, Turkalj and Braun (1978) reported the outcome of 448 completed pregnancies in mothers treated with bromocriptine in the early weeks of pregnancy and found no increase in the frequency of spontaneous abortion, twin pregnancy or congenital malformation compared with the general population. The second concern about the use of bromocriptine in these patients is the possibility that an underlying pituitary tumour may expand during pregnancy. The exact risk of this occuring is unknown but there are a number of reports of patients in whom it has occurred and who have been successfully treated (Kajtar and Tomkin, 1971; Child, Gordon, Mashiter and Joplin, 1975; Gemzell, 1975; Thorner, Besser, Jones, et al 1975; Jewelewicz, Zimmerman and Carmel, 1977; Linquette, Buvat, Gauthier et al 1977; Bergh, Nillius and Wide, 1978).

In order to avoid this complication it has been proposed that some destructive procedure should be carried out to the pituitary before conception occurs. Thorner et al (1975) advised external radiation but this does not always prevent the development of visual field defects during pregnancy (Thorner et al, 1975; Lambert, Seldenrath, Kwa and Birkenhäger, 1976). Also, the possible benefits of radiation need to be balanced against the unwanted side effects (Atkinson, Allen, Hadden, et al 1979). Other alternative methods of preventing expansion of a pituitary tumour during pregnancy include internal radiation with yttrium 90 as proposed by Child et al (1975) and surgical removal of the tumour (Hardy, 1971).

The problem which remains is how likely is the patient with hyperprolactinaemia to develop visual symptoms during pregnancy. Bergh, Nillius and Wide (1978) reported 17 term pregnancies in 14 amenorrhoeic women with hyperprolactinaemia and radiological evidence of pituitary tumour. Only two patients developed visual symptoms during pregnancy and these resolved after delivery. Mornex, Orgiazzi, Hugues et al (1978) reported no complications during pregnancy in eight patients with slight or clear enlargment of the pituitary fossa. Of the three patients studied here with equivocal or definite abnormality of the pituitary fossa who conceived while on bromocriptine treatment, none developed visual complications during pregnancy and none had radiological evidence of further pituitary enlargement after pregnancy. It is our current practice to assess the pituitary fossa in hyperprolactinaemic patients by means of a lateral skull X-ray and hypocycloidal polytomography in the lateral projection. If an abnormality is detected and the patient wishes to conceive, suprasellar extension of the pituitary is excluded by means of air encephalography in consultation with the neurosurgical unit. The patient is then treated with bromocriptine. This treatment is stopped when she conceives. She is reviewed at two weekly intervals in a joint ante-natal/endocrine clinic where visual fields, visual acuity and fundal appearance are checked at each visit. If suprasellar extension of the pituitary is confirmed, transsphenoidal partial hypophysectomy is carried out. After conception such a patient is similarly reviewed.

Twenty patients studied here have been followed up without treatment. One has resumed normal menses although her prolactin levels are still elevated and two conceived without treatment and completed successful pregnancies. This shows that ovulation and pregnancy may occur in the presence of elevated prolactin levels. It has been proposed that plasma prolactin levels interfere with the action of the gonadotrophins on the ovary (Thorner and Besser, 1977) and interfere with the release of gonadotrophin releasing hormone by the hypothalamus (Fuxe, Löfström, Hökfelt et al 1978). Clearly this does not occur in all hyperprolactinaemic patients. Some of these patients who have received no treatment have radiological evidence of pituitary tumour. There have been several reports of regression of pituitary tumour size in patients with longterm treatment with bromocriptine (Vaidya, Aloorkar and Seth, 1977; Corenblum, 1978; Nillius, Bergh, Lundberg et al 1978; Sobrinho, Nunes, Santos and Mauricio, 1978; McGregor, Scanlon, Hall et al 1979). However, there is insufficient evidence so far to suggest that all patients with hyperprolactinaemia and evidence of pituitary tumour should be treated for a long period with bromocriptine when there is no other indication for doing so.

SUMMARY

Forty-two (19 per cent) of 220 patients with menstrual abnormalities or infertility were found to have hyperprolactinaemia, including 32 (28 per cent) of 115 patients with amenorrhoea. Galactorrhoea occurred in 20 (38 per cent) of a group of 53 hyperprolactinaemic patients and radiological evidence of a pituitary tumour was found in 19 (39 per cent) of a group of 48 of them.

Studies of pituitary function showed that basal levels and reserves of the other anterior pituitary hormones were usually normal or increased. Bromocriptine lowered plasma prolactin levels in all patients. Examination of the pituitary fossa by computerised axial tomography using an EMI-5005 was of no help in the differential diagnosis of the underlying cause of the hyperprolactinaemia. The most useful investigations in this respect were the lateral skull X-ray and polytomography of the pituitary fossa.

Twenty patients were kept under review without treatment and two of them conceived and completed successful pregnancies. Twenty-one patients were treated with bromocriptine. Plasma prolactin levels were restored to normal in 20 and eight who wished to conceive succeeded in doing so. Two patients with suprasellar extension of the pituitary had transsphenoidal partial hypophysectomies and both subsequently conceived. This form of treatment should be reserved for patients with suprasellar extension of the pituitary who wish to conceive.

ACKNOWLEDGEMENTS

We are grateful to the consultants at the Royal Victoria Hospital, Belfast who referred patients for investigation, to Drs. J. O. Y. Cole, F. S. Grebbell, E. M. McIlrath and W. H. T. Shepherd for advice about the pituitary X-rays and CT-scans, to Mr. C. J. F. Maguire for documenting the visual fields, and to Mr. D. S. Gordon and Mr. I. C. Bailey for carrying out the transsphenoidal hypophysectomies. We are also indebted to Mr. D. S. Gordon for his advice about the management of many of the patients, to the staff of the biochemistry department, Royal Victoria Hospital, Belfast for the hormone assays, to the nursing staff of the Gynaecology/Endocrine clinic and the Metabolic Unit where the investigations were performed and to Mrs. B. Briggs for typing this manuscript.

J. D. Wilson was in receipt of a Royal Victoria Hospital research fellowship.

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CELLULAR DYNAMICS OF HAEMOPOIESIS. Clinics in Haematology, Vol. 8, No. 2, June 1979. Edited by L. G. Lajtha. (VIII + 310. Illustrated. £8.25). London, Philadelphia, Toronto; W.B. Saunders Company Ltd. 1979.

SINCE 1969 several techniques have been developed which have given the opportunity for analysis of various populations of haemopoietic cells and the factors which control their multiplication and differentiation. These methods define cells and populations of cells in functional rather than morphological terms. The contributors to this book give a very lucid account of these methods, the physiological information which they have provided and, in some chapters, a brief account of some of their clinical applications.

The book is *not* just another of these topical but ill-constructed collections of reviews written in a jargon incomprehensible to all but a chosen few. A deliberate and largely successful attempt has been made to present the subject in a form suitable for non-super-specialists. Inevitably there is some overlap between different contributions but this seems to maintain continuity rather than to irritate with tedious repetition.

The overall emphasis is on the physiological rather than the pathological. This is not a criticism but it probably means that the book will not be immediately attractive to the general clinician. For haematologists and immunologists it is a "must".

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BOOK REVIEWS

COMMON DISEASES, THEIR NATURE, INCIDENCE AND CARE,

By John Fry (Pp. 413, Illustrated £9.95). Lancaster, MTP Press, 1979.

THE book begins by discussing the concept of health, welcome in a clinical medical textbook. Next it briefly discusses the organisation of medical care in the British National Health Service and the different probabilities of disease presenting at different levels within this system. Techniques of coping with potentially unlimited workload are mentioned and the impact of social pathology on health and disease is outlined.

The main body of the book consists of a discussion of the common diseases affecting all the major organ systems of the body. A similar plan is followed throughout. First the common disease for each system in turn are defined and their relative impact upon morbidity in general practice, day's lost from work, and mortality is shown. Then each of these conditions is discussed in more detail in terms of epidemiology, aetiology, clinical features and management, often followed by an assessment of the significance of that particular condition to general practice. Finally chapter 51 discusses common diseases which occur at various ages throughout the patient's lifetime.

That this is all done within the space of 402 pages, most bearing at least one diagram or table, shows that of necessity the style must be terse. Many readers will welcome this economy of words but it does lend itself to dogmatism. The author has strong views on many management topics which he presents as fact with very little reference to recent research. Many experienced general practitioners might feel that some management topics could be subject to debate.

This aside, much of the book is excellent. The parts on epidemiology and clinical features of specific diseases could hardly be bettered. The style of the book throughout is that of the medical model, and this contributes to its success until "psychiatry" is discussed. Though the author states that conditions under this heading comprise well in excess of 15% of general practice, he disposes of this topic within 13 pages. In contrast is the treatment of "respiratory diseases" which make up 30% of general practice and which are dealt with in 105 pages. It is curious that no mention of the quality of the doctor-patient relationship is made here. A discussion of the theraputic importance of this is reserved for the management of asthma and migraine. In fairness, however, it must be said that this chapter shows the author to be an experienced and caring personal doctor with a firm grasp of the practical aspects of his subject.

In conclusion, this book would be of great interest and benefit to any practising general practitioner, and parts of it would be valuable to medical students, specialists in all disciplines and community physicians. It could be read from cover to cover with profit by general practice trainees and altogether it is a worthy addition to the growing medical literature on general practice.

R.L.M.

REVIEW OF GROSS ANATOMY. By Ben Pansky, Ph.D., M.D. Fourth Edition

(Pp. 524; figures and plates, £9.50). London; Bailliere Tindall, 1979.

THE author agrees with most teachers and students that the fundamentals of topographical anatomy are best learned by dissecting the cadaver where the structures can be seen and handled. However, the facts so learned are easily forgotten and require frequent revision. This book is well suited for the latter purpose. The presentation is convenient in that each double page has up to eight drawings on the right hand page with the appropriate text on the left. The 1,000 or more illustrations by the author ,many of which have the arteries, veins, and nerves appropriately coloured are of a high standard of draughtsmanship. There

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This book is highly recommended as an excellent comprehensive review of topographical anatomy and will be especially useful for medical and ancillary undergraduates and post-graduates preparing for examinations.

T.J.H.

MOTHERING YOUR UNBORN BABY. By Smith, D. W. (Pp. X + 97; illustrated. £5.00). Eastbourne; Saunders. 1979.

THE intrauterine environment and how it affects the fetus is a topical medical subject and it is not surprising that a book has appeared to convey the latest news to unsuspecting mothers-to-be. The author, a Professor of Paediatrics, demonstrates graphically that the welfare of the baby begins at conception and brings home his message firmly to his readers. A brief outline of the physiology of conception and early fetal development is followed by a description of the more common problems of pregnancy and the process of labour. All of this vast area is covered in 28 pages and although presented in simple language the information is not always strictly accurate. Also the reader in this country should be aware of the differences between North American and British obstetric practice.

The short chapter on nutrition in pregnancy offers sensible advice but is spoiled by irrelevant reference to animal studies. Fetal damage that agents such as drugs, alcohol, cigarette smoking and infection may cause are well explained and illustrated. However, one cannot help feeling that the author rather over reacts in his advice. Having described vividly the characteristics of the fetal alcohol syndrome with case-notes from patients who were chronic alcoholics, he advises the expectant mother to avoid taking alcohol at all. If that is not enough to worry a mother he adds, for good measure, that common drugs such as valium and aspirin **might** be harmful if taken during pregnancy. The expectant father is not forgotten; he is advised never to have on x-ray without asking the doctor to shield his testes and to give up reproductive activity after 60 years of age because of the slightly increased incidence of genetic defects in infants born to fathers over this age. The book provides some useful information but the mother who seeks education in these matters might prefer a more detailed and balanced account. The mother seeking quick advice from this book on how best to behave during pregnancy is in for a nasty shock.

J.W.K.R.

BEAT HEART DISEASE. By Risteárd Mulcahy, M.D., F.R.C.P., F.R.C.P.I., (Pp. 126; Illustrated. £1.95). London: Martin Dunity. 1979.

BEAT Heart Disease is a book which can be read with pleasure and benefit by doctors and lay people alike. It uses simple but precise language and clear illustrations to explain the importance of a healthy heart in the maintenance of good health. Concise chapters deal with the factors which can cause coronary heart disease, and the conclusion is reached that the bulk of coronary heart disease is preventable.

The core of the book is the section on "Exercise — The Key to Health". This is the best exposition of the benefits of exercise which I have read. It is lavishly illustrated in colour and provides simple practical solutions to the physical and psychological problems which deter many people, especially city dwellers from taking adequate exercise. The author's personal experience and practice are often referred to and his own delight in exercise is so

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The authors claim to have brought the book up to date especially with regard to advances in therapeutics and in laying emphasis on the growing part played in patient care by the linking of the hospital service with the various community services in the home.

Some criticism must be made of the balance of subject matter chosen for presentation. The word "pneumothorax" for instance does not appear in the index and there is no description of this condition in the text. There are descriptions however of rare diseases with less nursing content such as polyarteritis nodosa and systemic lupus erythematosus. The word "stroke" does not appear in the index and although there is a good description of hemiplegia the nurse is instructed at length on methods of physical treatment which are properly the function of the physiotherapist. The word physiotherapy is not mentioned, nor is occupational therapy. It is recommended here that "passive movements should be commenced a few days after the onset". This should surely be "a few hours". It is stated that "if the patient is unconscious for more than a few hours fluid should be given per rectum". This is not only unnecessary at this stage but in a situation where the anal sphincter is suspect and often defective may have disastrous repercussions. There are three and a half pages on poliomyelitis which is now rare in this country and only one page on multiple sclerosis which is relatively common and always with us. One would have hoped that roughnesses like these would have been smoothed out in a book which has reached its fifth edition.

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CLINICAL PHARMACOLOGY. By Girdwood, R. H. (Editor). Twenty-fourth Edition. (Pp. 608; illustrated. £9.75). London: Bailliere Tindall, 1979.

In recent years several textbooks have been published with the title "Clinical Pharmacology". Many of these are entirely new but this book (Clinical Pharmacology – edited by R. H. Girdwood) is the latest edition (24th) of a textbook which has been published with several titles including "Pharmacology and Therapeutics of the Materia Media" (15th edition 1939) and Dilling's Clinical Pharmacology (Twentieth edition – 1960). This latest edition appears three years after the previous edition and it stated to have had several chapters considerably revised. This book is directed at both students and qualified doctors but in this way may be of less value to each. For the student, the presentation is rather unexciting and many may have difficulties in determining what facts should actuallly be learnt. The clearer, more precise presentation in some of the newer books may be preferred. The relative absence fo any notes on historical aspects of drug development is regretted as this is an important aspect of the education of students in this subject. Although the book contains much information about actual drugs there is duplication; e.g. a page is devoted to isoprenaline in the chapter "Drugs affecting the nervous system" and another page in the chapter on "Drugs acting on the respiratory system" with resultant overflap in content, but in neither instances is there satisfactory discussion on the treatment of bronchial asthma or of status asthmaticus and neither subject is included in the index. Although several pages are given to drugs which lower arterial pressure, the section on the treatment of hypertension is quite inadequate – 16 lines – and would be of no value to students.

I do not envisage this book being of value to qualified doctors as the criticisms given above also appely but in addition there is not sufficient information about the factors to be considered in choosing a particular drug and the bibliography at the end of many chapters is unhelpful — e.g. in the chapter on "Drugs acting on the alimentary system" there is only one reference to a publication on cimetidine.

In conclusion it is difficult to see to whom this book will be of value. It does not live up to the title"Clinical Pharmacology" which is the study of the effects of drugs in man.

R.G.S.

LUNG SOUNDS. By Paul Forgacs, M.D. (viii + 72. £1.95). London: Bailliere Tindall, 1979.

THIS book's purpose is to establish the clinical significance of lung sounds, and thereby improve the diagnostic accuracy of auscultation. The method is to analyse lung sounds in acoustic terms and to correlate them with physiological measurements. The reviewer has no doubt about the continuing value of auscultation. Wheezes and rales are not radio-opaque. He has enjoyed reading this book (or trying to read it, he not being musical or acquainted with the physics of sound). It is well designed. The English prose is admirable. No doubt the physics and physiology are as correct as present knowledge admits. As a physiological text, this one seems first class. What one doubts is whether these physiological interpretations help in diagnosis of the bronchopulmonary disease. Lung sounds tell one something is wrong; they may tell us in what site it is wrong; occasionally, for instance in bronchiectasis, they they tell us as much about the diagnosis as is ever likely to be useful. They may exclude lobar pneumonia (not that we ever see it now), or they may include a collapsed lower lobe in the possibilities. But given the physical signs and given the x-ray chart, determining the cause so often depends on the background, of the course of the disease, family history, occupation, environment, smoking habits and general condition. Doctor Forgacs knows all this, but a student introduced to the book might break his heart trying to diagnose lung disease on physical signs alone.

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The reviewer has long lost his early enthusiasm for lung physiology. It has been a minimal contributor to knowledge of the aetiology of lung disease. Can any one doubt that what bronchopulmonary diseases need today is more knowledge of causation? Can anyone doubt that that knowledge is not going to come from study of lung flows and volume?

Nevertheless one wishes that all text books were as this elegant little volume, which is recommended for teachers, but not for undergraduates.

J.S.L.

THE BASIS OF CLINICAL DIAGNOSIS. By R. W. Parkins and G. D. Pegrun. Second Edition. (Pp. vii + 493; illustrated. £5.95). Tunbridge Wells: Pitman Medical, 1979.

MEDICAL students, in their introductory clinical course have a difficult time. They are taught the methods of clinical diagnosis before they learn about pathology or the clinical presentation of disease. Thus the clinical methods that they are taught are often of little obvious significance to them and they are bewildered when their teachers refer to diseases. For teachers it means that the clinical methods must be based on normal anatomy or physiology and that simple descriptions of many diseases have to be given. To help the students there are a number of books describing clinical methods and of course, there are numerous textbooks of medicine and surgery giving descriptions of diseases.

This book is described as an introduction to clinical studies for medical students. It is intended to emphasise the relationship of symptoms and abnormal physical signs to the underlying disorders of structure and physiology. The first chapter covers history taking and a general scheme of physical examination and for reasons which are not clear includes sections on the diagnosis of death and on drug overdosage. The remaining chapters consider each of the major systems of the body in turn. The chapters start with a discussion of the anatomy of the system and then consider how abnormalities in function can occur. Symptoms are then considered and the method of examination of the system is described. The chapters end with a description of special investigations relevant to the particular system. Throughout the chapters brief descriptions are made of a large number of diseases and their are tables giving lists of causes of various symptoms. Illustrations include diagramatic representations of the structure of various systems as well as some clinical photographs. The photographs are not numerous and it seems strange to include pictures of an auriscope and an opthalmoscope.

This book is not completely successful in its aim. The descriptions of structure and function are didactic and much of the book consists of catalogues or lists of causes of symptoms and very brief, often inadequate, and sometimes inaccurate, descriptions of diseases. The style is tedious and the book is long. The student entering the introductory clinical course is full of enthusiasm and he feels that at last he is approaching his life's work. It is vital that this enthusiasm should be encouraged. It is difficult to see that the student could be anything but dismayed and disillusioned if he attempted to use this book to help him understand clinical diagnosis. This book might be of some value as a reference book for members of the paramedical professions who wish to obtain brief information on conditions which they may meet during their work.

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AN INTRODUCTION TO MEDICAL SCIENCE: A COMPREHENSIVE GUIDE TO ANATOMY, BIOCHEMISTRY AND PHYSIOLOGY. By Ned Durkin. (Pp. 290. £6.95). Lancaster: M.T.P. Press, 1979.

THIS is an interesting book designed for beginners in the various branches of the medical sciences who wish to learn the elements of human biology required for medicine. In its 290 pages it attempts to describe the anatomy, physiology and biochemistry of the human organism together with the necessary physics, chemistry and mathematics required to understand each of these areas.

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However, the author makes the point that the facts required to understand the science of medicine can not be obtained without very hard work. As he states: "Professional excellence in a medical field has always been achieved slowly, by hours of study and work, and has been built on a rock-solid foundation of basic science". This book should give the student the facts on which he can base his understanding of the subject, if and when he has the time and ability to digest them.

I.R.

PSYCHIATRY. By W. H. Trethowan. Bailliéres Concise Medical Textbooks. Fourth Edition (Pp. x + 488; £4.50) London; Bailliere Tindall, 1979.

PROFESSOR Sir William Trethowan has revised and largely re-written this short textbook The previous editions appeared under the name of Professor E. W. Anderson, formerly Professor of Psychiatry at Manchester. The latter was well known for his knowledge and experience of German psychiatry gained during a lengthy period of post graduate study in that country just before World War II. This led him to become one of the foremost exponents of phenomenology in Britain. As defined by Karl Jaspers, who can be considered as the leader of the phenomenological school, phenomenology means, in effect, putting oneself into the patient's person, in order to understand as intimately and in as much detail as possible, the nature of the patient's mental experience. It also means portraying in words the nature of the experience as subtly and accurately as possible, while, at the same time, defining it in appropriate technical terms and differentiating it from other kinds of experience. This is an empirical procedure which takes place at a conscious level.

Professor Anderson used Karl Jaspers approach in previous editions of this textbook. Professor Trethowan, who collaborated with the last two editions, was a pupil of Professor Anderson. Though the textbook has been largely re-written, the phenomenological approach to psychiatry is continued. Most aspects of mental illness are covered, including a chapter of psychiatry and medicine dealing with the psychiatric aspects of general medicine and surgery. An almost entirely new chapter on mental illness and the law brings the reader up to date with many of the recommendations made by the Government in their White Paper (1978) reviewing the England and Wales 1959 Mental Health Act.

The student will find the chapter on Psychopathology especially useful because of the careful definitions of the symptoms and signs of abnormal mental states. However the deliberate omission of the term neurosis and its replacement by the term abnormal emotional reaction is likely to confuse. The author's preference for the latter term has much to recommend it. However neurosis has been retained and carefully defined in the recently introduced 9th International Classification of Diseases. Hence neurosis will continue to be used in psychiatric terminology for years to come. The chapter on personality disorders is a useful introduction to Kurt Schneider's rather complex clinical classification of abnormal personality.

The length of this book means that it no longer can be regarded as a concise textbook. It can be thoroughly recommended to post graduate trainees in psychiatry as an excellent short review of the German phenomenological school of psychiatry. Senior medical students will find much of interest in many of chapters. However they may find its length and phenomenological emphasis rather heavy going.

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