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LEARNING AND TEACHING BY FAMILY DOCTORS*

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FEW people remain unmoved by the sight of a high mountain. To some such a peak is a challenge; others are overawed. Some climb it just because it is there or go up into it for inspiration which they cannot draw from everyday scenery in the valleys and plains. Mackenzie himself was such a mountain. His achievements tower above those of his own and later generations.

Once a year the College sends someone to explore this mountain and once a year the James Mackenzie lecturer comes back to make his report to the assembled College and its friends. In this particular year, during which so much attention has been paid to the future of medical education and to the academic content of general practice, I am deeply grateful to Council for sending me on this thirteenth exploration of the mountain. The mystery which drew me forward particularly was the problem of how James Mackenzie was able to learn so much in general practice and to teach so much about general practice. How could he draw so much inspiration from a plebeian practice in Burnley? What notes did he keep? How did he extract information from these and how quickly could this be done? Apart from cardiology, what else did he study and what use did he make of this new learning? Following this trail I came to wonder what impact Mackenzie would have made upon our College if he had been in practice today and to ask in what way the College might further his objectives in learning or teaching.

The last quarter of the nineteenth century was an age of giants and out of obscurity James Mackenzie grew to be amongst the greatest of these giants. Pioneers were breaking into new territories all over the world and through all the fields of science. Mackenzie was the first general practitioner in Britain to apply scientific methods to

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medical problems in his own practice, as others had done or were doing in China¹, in India² and in Malaya³.

“ O Tekna, Tekna . . . ”

This lovely sounding passage is no doubt as meaningless to most of you as it is now to me. Yet as a young schoolboy I knew by heart the whole of this speech by Medea to her children; and later, anatomical relations were learned in the same way.

Learning by rote starts in the nursery and should have finished long before a student reaches medical school. President, you reminded us in 1961 how James Mackenzie revolted against learning by rote.⁴ He exhibited in a high degree that persistence of all dedicated men who are unwilling to take ‘ don’t know ’ for an answer. Like Manson already in China, and Ross in India, Mackenzie in Burnley soon found himself involved in a painstaking study of problems which he could not understand. He was able to carry out this fundamental research because he organized his thoughts by writing notes and reading them again, by hypothesis and problem definition, by experiment and by criticism both of book knowledge and of himself.

Mackenzie's records

In 1962 I was privileged to meet Mackenzie's elder daughter, the late Miss Dorothy, on a visit to her home at Waterloo near Southport. She told me how her father would organize the whole family into helping—for example to smoke a fresh supply of drums for the sphygmograph—and how totally absorbed in his records he could become. Fortunately some of his early notebooks survive in manuscript with smoke tracings attached. The earliest I have seen begins on 2 November 1890 with a three-page record about William Campbell's fall through a window, his spinal injury, the pulse tracings and his operation, a sketch of his paraesthesia and, finally, a page of post-mortem notes and a drawing of the fracture-dislocation which killed him; all in Mackenzie's own hand.

This volume of notes about patients visited unfortunately ends on 3 May 1891 just as the influenza epidemic began, but not before he had taken nine serial pulse tracings from Mrs Leeming at various levels of her temperature. The visiting book and three surgery case books in the department of public health and social medicine at St Andrews University were kindly lent to me by Professor Alex Mair. As far as is known these are the only manuscript records about his daily work which still exist. The surgery case books cover the last years at Burnley from 16 March 1903 until the doors close behind Mrs Hayward of 167 Oxford Road, the last person to consult him there on 29 November 1907. Mackenzie found her “ very nervous

and depressed", though not necessarily because of his departure; she had been like this on each of the three previous occasions he had seen her.

From these books it is possible to reconstruct a few of the circumstances surrounding his work. His manuscript notes are not easy to read and contain many abbreviations. Secretarial help was scarce in those days, but on and after 11 February 1891 entries for all patients in that visiting book were made in another handwriting, that of his wife, Mrs Frances Bellamy Mackenzie. She seems to have been copying or, more likely, taking dictation since words and phrases are occasionally missing for which space had been left; but they were never filled in. And how bravely she struggled to get down all the difficult words like 'parotic' glands, and 'corrotid' artery. His own handwriting adds a few details here and there but how long Mrs Mackenzie continued her note taking we cannot now learn. Little Dorothy would still be in the nursery and Jean was not born until two years later.

In 1890-91 no diagnoses were entered in the visiting book except where these were descriptive, such as rheumatic fever, measles, or hydrocele; but in the 1903 surgery book he later added a marginal note about each patient, giving each illness a category, such as 'circul[ation]', 'skin', 'lungs', 'cough', 'ears', 'rh[eumatism]', 'dig[estion]'. These were discontinued in 1904 and no further marginal notes appear until 1907. In that year he made a special mark against one or two patients out of every ten, many of whom had digestive symptoms. Does this indicate that, if Mackenzie had stayed longer in Burnley, he was planning to study digestive diseases, especially those with pain—a subject in which he had developed an early interest? In 1897 he had already published a paper on the site of pain in gastric ulcer⁵.

Diagnostic aids

From the notebooks we can learn something about his diagnostic aids. He used his microscope frequently in 1890 and 1891 to examine urine for casts, red cells and pus; and he tested several specimens for albumin and specific gravity. He could use a laryngoscope skilfully and has left us an occasional drawing, including one of Mercy Wells' vocal chords when this "pale, red-cheeked, fat, chlorotic girl" tried to say 'ah' on 6 February 1891. He recorded a strong smell of acetone in old Mrs Kershaw's breath three days before she died of her fourth apopleptic fit, the urine at the time also showing a trace of sugar. In December 1903 he began experimenting with a very modern looking rubber stamp of the torso, on which he marked the distribution of cardiac sounds and murmurs in new patients but this seems to have been discarded after a four months trial.

With his sphygmograph he took innumerable records, for example one from Thomas Wilson, aged 4, during his measles and croup in December 1890. While Thomas was recovering, he took tracings from Mrs John Spencer during her confinement three days before Christmas. Records were made not only between, during and after her pains but also at 8.20 p.m., just five minutes after the birth of her child (for which he had also administered the chloroform). He took another tracing the next day as well as one on Christmas Eve. On 14 April 1891, Mrs Saul's tracing, taken a few hours before she died, was amongst his earliest to show auricular fibrillation, though seven more years were to pass before Mackenzie understood how this irregularity arose.

Blood pressure

Mackenzie tells us that he had used various instruments in studying blood pressure. In the notebooks no figures are recorded until he began using a new "more reliable"⁶ instrument on Monday, 22 May 1905. The first patient in afternoon surgery that day was Joseph Hargreaves, aged 62, who complained of dizziness. His pulse was quick and soft and his blood pressure was recorded as "Oliver = 90. RR = 140". The next patient, Miss Pratt, also had her pressure taken: "O = 120. RR = 180". After seven other people had consulted him for minor ailments Mrs Ford's blood pressure was recorded as "Ol = mm Hg. 115". He had already taken the instrument out with him on the morning round, measuring the pressures of Mr J. Moss and Mrs Duerden.

The next day being Tuesday he did not take a surgery but he had the instrument out again on his round. On Wednesday, 24 May he not only recorded the blood pressures of more new patients in surgery but also for the first time took readings on people like Mr W. Simpson who had originally consulted him in March, and about whom he recorded: "today much btr. BP O = 80. RR = 130." From then on blood pressure readings appear every few pages.

The abbreviations used by Mackenzie in these early months recall the names of George Oliver who studied what is now called the diastolic pressure, using an aneroid barometer, and of Riva-Rocci who had devised the first simple mercury sphygmomanometer. The new instrument was Martin's modification of the Riva-Rocci. Mackenzie didn't use a stethoscope; he "used only the method by which disappearance of radial pulse is detected"⁶. After only nine days trial with the new instrument he entered no further records about diastolic pressure (Oliver) up to his leaving Burnley in 1907, but continued to use RR for the systolic pressure until 26 July; then, on and after 2 September he entered only one reading, as 'B.P.'

Mild and serious

As well as serious illness, he dealt with all the so-called trivialities of modern practice. Sunday, 21 May 1905 was interrupted by an old woman coming up to surgery with eczema on the back of her hands which she had had on and off for two years. He syringed wax out of people's ears about as often as we do. He had to write various certificates, though not so often as we must; he also got his little notes through the letter box, like the one from Mrs Mild in August 1906, telling him that her throat was rather better but her spit was thick and yellow but it did not affect her swallowing as it was only sore on one side, though she was quite deaf and her left ear was buzzing all the time. No doubt Mackenzie kept this note for the wealth of symptoms it revealed.

On Monday 18 November 1907 out of nine new patients in surgery four were what might now be called psychosomatic. Miss Bramwell was depressed, miserable and sleeping badly; Miss Stanwell had a headache and was sleeping badly; Miss Inkar had pain in the back, legs and head; while Miss Jowitt's nerves were trembling. Three out of these four were given Mist. Ammon. Brom., Mackenzie's universal tranquillizer; but one of the ladies only got his advice. After all these in came Sarah Askwith, a new patient, aged 30, with an enlarged heart and systolic murmur after attacks of rheumatic fever at the age of 18 and again at 20, which had "stopped her running up hills like other girls." Many vivid portraits in the notebooks underline the welter of cardiac failure with which Mackenzie was dealing. The primary cause was certainly rheumatic fever but anaemia must have played an important role, aggravated by much childbearing. One of Mackenzie's patients was attended in her twenty-first confinement.

Mackenzie was interested in the mechanism and meaning of pain at various sites, abdominal as well as thoracic and skeletal. In 1903 he made a short analysis on a loose piece of paper, still in the notebook, about ten patients with digestive disorder, noting their symptoms and signs and other details as well as their treatment and its results. By 1906 he had extracted from his notebooks in pencil on a folded sheet the details about 100 patients with abdominal pain and other symptoms. What would especially interest our Record and Statistics Unit is his summary: "100 in 1000". This presumably gives us for Burnley of those days a patient-consulting rate for abdominal pain of ten per cent. How does this compare with nowadays?

I have quoted far less than a tithe of what remains to be studied in these manuscript notes of James Mackenzie. We know he was rushed and, therefore, inaccurate at times, as shown in his note

about Miss Duckworth, aged 4, who was developing pneumonia on 25 January 1891. He entered her pulse as 130 and respirations as 48 per minute but the temperature as 400, perhaps instead of 104°F. But he did measure the specific gravity of her urine that day and tested for sugar by Fehling's method. In this child fortunately the crisis came at 2 a.m. on 28 January and by the next morning Miss Duckworth was "lively and playful."

Clearly Mackenzie, like Manson before him, felt none of that mystery which now appears to surround this word 'research'. So let us spell it out in full. Research simply means 'searching diligently'. Searching for what? For new physical signs and symptoms, some of them microscopic or serological, using new diagnostic tests. It means looking too for the absence of such physical signs, whether on Mackenzie's polygraphs or in random blood samples, urine tests or cervical smears; and thirdly for new links between cause and effect, for new attitudes towards health and disease. We in general practice have fallen heirs to a new epidemiology, through the plethora of new devices and tests which we can now apply to our patients. It is not the size or complexity of any test or apparatus which determines its value, but the person who uses it. At the right time for the right patient a finger in the rectum, a throat swab, or a polygraph tracing may be of more value in saving life than a computer or an electron microscope. The continuing challenge to family doctors is how to use these new tests appropriately for our patients' benefit.

The word research also means for us, as it did for Mackenzie, data recording and data extraction. It means that when you have made and recorded 10 or 100 observations, you should sometimes pause and look at them again, seeking to understand what they are trying to tell you. When the penny drops it may go through a new hole. The result then is no longer research but discovery. Research is hard and wearisome, seldom apparently rewarding. "Men, like myself", wrote Manson, "in general practice, are but poor and very slow investigators, crippled as we are with the necessity of making our daily bread"⁷. If discovery comes, the pain of research is forgotten. As when climbing a mountain, the greatest thrill comes when you reach the top. If you never start climbing, you save yourself a lot of trouble but you will also never see the widest view, except in other people's photos. Research is like setting off to climb: discovery is the view from the peak.

Learning to learn

If not by rote, how then is Osler's 'perpetual student' to learn his medicine? No student can take on in medical school enough intellectual cargo to last for his whole voyage. He will need to

replenish his stocks in every port. He must learn to learn as he goes along. This is the first lesson for all scientists. The intending doctor, whether at school, in hospital or later in practice, must learn to listen with understanding; he must learn to perceive—which is to see with understanding—and, when he does not understand, he must learn to ask awkward questions. In the ‘Scientia’ of our College motto, if we don’t ask other people sharply defined and sometimes awkward questions, we will never learn to ask ourselves one.

An anatomy of this ancient word ‘learn’ shows us at least four components: there is learning *about*, learning *how*, learning *from*, and learning *by*. The student in hospital gradually learns about medicine, about patients; the doctor in established practice may wish to learn about a new treatment. At all stages of our medical life we go on learning how. On his first day, does the student still learn, as I did, how to open a boil? Before he could study pulse tracings Mackenzie had to learn how the sphygmograph worked. For him there were no Upjohn Fellowships to help with his post-graduate studies.

If for Mackenzie learning how was laborious, he had no dearth of people and experience to learn from. From those early days in pharmacy, he must have derived his appetite for medicine. From his first day at school and later from his teachers in Edinburgh may have stemmed some of that healthy disrespect for dogma which guided so much of his later thinking. In a letter quoted by Dr McConaghey⁸ last year Mackenzie acknowledges how much he learnt from his senior partners especially about prognosis. A close reading of his notebooks shows too how much other doctors in Burnley were learning from him. From one source of learning Mackenzie was happily spared, namely the advertisements in our morning mail.

It is from patients, however, that many doctors learn their most enduring lessons. As William Withering had learned from an old woman in Shropshire more than 100 years previously that foxglove was good for dropsy,⁹ so Mackenzie learned from the lips of his patients the language of angina pectoris. Listen again to what he learned from John Simpson, a mule spinner, the day before he died. “When I saw him he was taking some food, but was feeding himself entirely with his right hand, keeping his left resting across his breast. Enquiring as to the reason for this, he told me he dared not move his left arm, as when he did so he always induced an attack of pain. . . The following night . . . during a severe attack he lost consciousness and died”¹⁰. Mackenzie relates that angina “may be provoked with great ease, and from sources that call for no extra effort on the part of the heart,” including “the mere stimulation of the skin under the

left nipple, with very slight movement of the left arm. . ."¹¹ Before I had learned about this from Mackenzie's writings, I saw a man with coronary thrombosis develop severe angina and die during my injection of morphine into his left upper arm, and in another similar case a man collapsed while I was taking his blood pressure on the left arm. How well known today is this danger to which John Simpson first drew Mackenzie's attention?

What about the fourth component of learning—'learning by'? Learning by reading follows in the nursery soon after learning by rote. To Mackenzie, for whom his early reading of an encyclopaedia had proved such a disappointment, the printing and duplicating explosion of the twentieth century would have seemed at once an intolerable burden and a hopeful means of education. "What a tool is to a workman", wrote Mackenzie "so should a textbook be to a busy practitioner"¹².

In the early years at Burnley he had few chances to learn by professional listening or by talking except with his partners or consultants. There was no local medical society which he could attend, no faculty meetings, no postgraduate courses, no tapes from a Medical Recording Service.

One opportunity was open to him, as it is open to all of us in general practice—learning by chance; and the deepest incisions on our memory are cut by attendance upon unexpected tragedy. From that moment we are changed. After conscience has made cowards of us all, atonement may turn some like Mackenzie back along the path of inquiry, leading to new discovery. In the *Beloved Physician* MacNair Wilson¹³ has given us a vivid description of that moment when death from heart failure suddenly and unexpectedly took a young woman whom Mackenzie was attending in labour. No other sudden death on record appears to have had such momentous consequences.

Learning by thinking about such 'melancholy experience'¹⁴ as that girl's death, about the meaning of symptoms, about old Dr Briggs' capacity to foretell the future of his patients—this was the quality more than any other which distinguished Mackenzie from the great majority of his colleagues, whether in general or hospital practice. If now the thinking edge of general practice is any wider or less blunt than in those days three quarters of a century ago, we know full well whose example is being followed by men like Pinsent, Crombie, Hope Simpson, Watts, Staines, Walford, Fry, Kuenssberg, Hodgkin, Slater, Eimerl, and many others.

Learning by doing, by research, by experiment came naturally to James Mackenzie in his attempts to measure and record and understand what he saw in his patients. First with the pulse writer, then

with straws gummed to the neck, later with that fearsome revolving clockwork drum and finally with the ink polygraph made for him by Mr Shaw, Mackenzie studied the circulation of young and old, day and night, even upon their death beds.

Therapeutic experiments are more numerous today than in Mackenzie's time. Do we learn from ours as much as he did from his? The paucity of drugs commonly used by Mackenzie is most striking, perhaps a little more than a couple of dozen; yet he studied their action as critically as the patients to whom they were given. On the difficulty of estimating the effects of remedies he writes¹⁵: "It is therefore necessary . . . to glance briefly at certain factors which influence patients and physicians in the selection of cardiac remedies. The most potent of these factors is suggestion . . . There are many people who imagine they have a cardiac affection, and are in consequence peculiarly apprehensive, and any circumstance which remedies that apprehension will at once relieve the patient; . . . to discriminate the real from the seeming is a matter of extreme difficulty . . ." Mackenzie goes on to describe what may be the first patient-recorded placebo trial. The subject was an intelligent man who suffered from frequent attacks of angina pectoris, always relieved by nitroglycerine. At times he also had attacks of cardiac dyspnoea, relief from which was also obtained by the use of nitroglycerine, although it took half an hour to act. Mackenzie doubted, if it took so long to act, whether the nitroglycerine could be the cause of his relief and persuaded the man to keep a chart of his attacks of breathlessness. This chart recited the occurrence of two attacks which were duly relieved half an hour after taking the nitroglycerine. Then a third attack was described, for which only a peppermint lozenge was taken, and in a quarter of an hour complete relief was obtained. The patient remarked that he had great faith in the efficacy of peppermint. Mackenzie adds "It is scarcely necessary to point out that the infinitesimal quantity of peppermint could never have acted unless accompanied by the faith in its activity."

In the midst of a prodigiously busy practice, Mackenzie still had time to learn, as we can learn, by writing scientific papers. He had only been in Burnley four years when his first two articles were published by the *Lancet*, describing a case of 'hemiparaplegia spinalis'¹⁶ and putting forward a new hypothesis about the nature of muscle sense.¹⁷ For sheer speed of data extraction his paper on the 1891 influenza epidemic must take some beating. He saw over 250 cases between 25 April and the end of June. Three months later his seven page report was already in print.¹⁸ In the first 15 years at Burnley he had published 21 papers in eight different journals, more than half of them dealing with subjects other than cardiology. A

total of 102 scientific papers by Mackenzie and ten books are listed in our College library.

In Britain, family doctors undoubtedly learn by their home visiting, although this is widely disputed or simply not understood by many of our colleagues overseas, particularly in the Americas. Not only by noticing a spick and span parlour or the utter chaos in a kitchen, but also from the books, the pictures, the toys, the unmade beds, the separate bedrooms, can the health and welfare of each family be sensed at first-hand; while future changes can be watched in a way that cannot be discovered during a consultation in the office.

As well as what we learn in this way about our patients, we can learn much by listening to them; not only to their hearts or to what they mean to tell us, but also by listening to what they say unwittingly about their relationships within and outside the family by their use of idiom. Michael Balint¹⁹ has taught us to listen particularly to the last phrases of our patients as they relax just before leaving 'the presence'. "How is Mary?" I asked a woman as she left after one of her all-too-frequent discussions about her bad heads. "Oh, she's an absolute headache", she replied and by that remark revealed to herself as well as to me the underlying cause of her tension. She has not been to see me since. "The job irritates me" said a man as he sat scratching at a patch of reddened skin on his forearm. "The neighbours make me sick" said my bilious patient as the door banged beyond the party wall. "I'm tired, doctor." "Tired or tired of?" I asked. Looking back through the notebooks we find that Mackenzie's patients were saying these same things to him but no encyclopaedia, no textbook to which he could have had access, would have thrown any light on the hidden meaning contained in these idiomatic phrases. His writings and comments in the notebooks leave us uncertain whether he made any distinction between these psychosomatic phrases and those physical symptoms which he spent a lifetime in studying.

Another advantage which we in general practice have is to learn quite easily by follow-up. A simple example would be the child who is brought up about a puzzling papular rash on the trunk and face. Is it or is it not chickenpox? If still in doubt next day, we may now safely wait for about a fortnight to see whether any other children in the house take the disease. Today we remember the use to which Mackenzie put the systematic long-term follow-up of his patients and their symptoms. He describes²⁰ how 18 years passed between his first attendance on a woman with gastric ulcer, whose heart had already been affected by her first attack of rheumatic fever, how he attended her in two further attacks of rheumatic fever and for three

other episodes of heart failure with angina due to increasing tricuspid and mitral stenosis, until that day in 1898 when she collapsed with a severe heart attack, in which he recognized for the first time the nature of what is now called auricular fibrillation. Armed with this new understanding he could then go back through his tracings and find many other patients, such as Mrs Saul, whose pulse had shown this type of irregularity.

Throughout our practising lifetime, but particularly in the early years, we all learn by example what to do and what not to do. It is in this way, if we are lucky, that we feel the impact of the Great Teacher. For Mackenzie the exemplar in his early years was probably Joseph Lister.⁸ In his later years Arthur Keith, William Osler and no doubt others fired something in his imagination; but when he entered general practice in Burnley, it had been Dr William Briggs his senior partner, with his confident certainty about the outcome of his patients' illnesses, who unwittingly started Mackenzie off on his long study of prognosis.¹³ And now for us in this generation Mackenzie himself has become the Great Teacher.

Teaching

The sweetest music to the ear of the medical fledgling is that word 'doctor' when it slips out for the first time. Doctor—Teacher: these words are synonymous. The student's torch has now been lit. He now carries a flame which has descended to him from the dawn of medicine. In his turn through his teaching he may bring light into the Temple of Aesculapius and search out the dark corners of ignorance and ill health. But what is he to teach? Who is he to teach? First he must learn to teach himself, for learning to teach is as hard as learning to learn. In school and at university he should have learnt to learn. In medical school he should have *learned about* medicine, about health and ill-health, about physical and mental suffering, and how to examine and to treat people who suffer. Then as a young graduate he will start learning to teach. He will need *training for* general practice or for some limited field in which he wishes to specialize. A specialist is trained to deal with problems; the family doctor needs training to deal with people. But if his medical school was only part of a hospital, not part of a university, or if there was only a hospital but no general practice attached to his medical school, the student's education may well have been warped; and whatever medical work he then takes up, his attitude may be lopsided. After all, because a man may eventually work in hospital why omit to teach him about all the doctoring that goes on outside? Because many men will spend their lives trying to define that border-line between health and early symptoms, why teach him only to recognize gross disease? "The profession has never been

trained how to examine a patient when the disease only presented subjective symptoms", wrote Mackenzie¹⁴ in 1918. What progress have we made since then?

It is not enough that some medical students pass through general practice teaching units in Edinburgh, Manchester or elsewhere. The majority of students are still not taught about, or taught sufficient about, primary medical care. It is not enough that some keen young doctors follow a purposeful course of training for general practice, either by chance or on the advice of an inspired teacher. The profession as a whole has failed to recognize that teaching students about only half of what goes on in medicine will more than double the difficulties which all these young doctors meet later on, whatever career they choose to follow.

Undergraduate teaching and postgraduate training are both enriched if the teacher can draw on his own experience, if he can involve his student in the thinking behind his work. Failure over the last 40 years to utilize the practical wisdom of family doctors in teaching students and young graduates has stultified Mackenzie's vision of a wider medical education. If he had been alive today he would certainly have welcomed, if not indeed written, the College's recent evidence to the Royal Commission on Medical Education.²¹ Listen to what he wrote on the same subject nearly 50 years ago¹⁴: "An uneasy sense is beginning to prevail that all is not as it should be in the medical world . . . the laboratory and hospital worker have practically acquired the power to guide and regulate the teaching and investigation of the whole sphere of medicine, totally unaware that great fields of medicine essential to progress lie outside their spheres . . . The majority of patients which the general practitioner is called upon to treat present phenomena which he has never been taught to recognize, while the diseases themselves are, many of them, quite different from those seen in hospital. The result is, that general practitioners, after they enter practice, have to forget much of what they are taught, and set about re-educating themselves . . . It is the general practitioner . . . whose life-work gives him the opportunity of seeing all parts of medical science in its true perspective . . . Yet he has no say in medical education or research. If any teaching appointment falls vacant, by the fact that he is a general practitioner he is excluded."

How many years must the students wait . . . ? It would seem that family doctors must now learn to teach not only themselves but also the next generation's teachers. Above all there is a need to teach those who control the mass media. When will we see a programme on medical research not limited to tubes and machines, however expensive, but exciting an interest in studies by general practitioners. Those who did speak for the College before the Royal Commission

should heed Mackenzie's warning "Be not too sanguine of a speedy success in your efforts. Many difficulties will confront you, but if your work be honestly and thoroughly undertaken you will have lighted a torch that will illumine the whole realm of Medicine"¹⁴.

The type and duration of postgraduate training for general practice which our young doctor can afford may vary from a few months in a colliery practice at Spennymoor, which had to suffice for Mackenzie, to six years or more like someone I knew, whose aim was to do a job in every specialty. He wanted to be able to speak to specialists in their own language; and this might still be a useful aim for those seeking one of the excellent rotating house jobs which are not yet easy enough to find. A spell as 'locum' in general practice between house appointments in hospital can add a new value to one's work in the wards, as Mackenzie may have found when he returned from Spennymoor to Edinburgh.

And so our young doctor is now ready to take up an appointment as trainee assistant. This visionary idea must not be allowed to fade. The defects are removable and the scheme should be reshaped by promoting wider incentives and removing financial barriers for those who wish to use this means to continue their education. Just think what might have come from a succession of trainee assistants in James Mackenzie's practice. Was it really more valuable in the end that Mackenzie helped to train a few modern cardiologists? If only he could have stayed at Burnley and done his teaching as a general practitioner, instead of as a London consultant or director of an institute. If only the Research Institute could have been built around his practice in Burnley, not in London or St Andrews.

The College, if it had existed then, might have made the move from Burnley unnecessary. He moved in order to teach more widely. There was then no *College Journal*, no regional faculty, no Pfizer Lectures, no Geigy symposia, no General Practice Section at the R.S.M., no G.P. Section at the Annual B.M.A. Meeting, through all of which Mackenzie might have spoken direct to family doctors. As it was, a remarkable variety of papers in medical journals, the laborious preparation of articles and books and his Sunday case conferences were the only means open to the young Mackenzie to teach what he had learned in general practice, and most of that teaching reached the eyes and ears only of specialists. So he left his practice and went to preach. Medical students then could not go to him, so he went to the students, in hospital, and thereby may have unwittingly delayed the wider establishment of general practice teaching units by many years.

Relationship in medicine

Neither the patient alone, nor the doctor alone, but the patient

consulting his doctor is the central point in medicine. This is the supreme learning and teaching moment towards which our young doctor's training leads. All else ebbs and flows around this relationship and it is in general practice that the primary consultation most frequently takes place. Specialism differs from general practice according to the quality of the introductory letter, which a patient brings with him. The better the letter, the more the specialist can do for patient and doctor alike. A meagre letter throws patient and specialist together in a primary consultation, which neither was expecting and for which specialists are no longer trained.

Social medicine differs from general practice, amongst other ways, in being compelled to do without the consultation between doctor and patient. Its alternative relationships between patient and nurse or patient and social worker do not have the same quality or depth. These are most fruitful when related to the central point, the patient-doctor consultation. The consultation most fruitful for a patient is when he sits in front of "*my doctor, my teacher*". At this moment behind and around him, visibly or invisibly, stand his family and his habits, his genetic and personal past. Supporting the doctor at the centre in this consultation with his patient are his *Scientia* and his *Caritas*, his training, experience and responsibility. Around them both lies the community in which they live and work. Wherever the consultation starts and however widely it ranges, in the patient's mind are two questions: what will happen to me? what can you do for me? Whether in silence or not, touching the hem of the garment still goes on. Michael Balint is saying this when he tells us that the most commonly prescribed medicine is the drug 'doctor'. Mackenzie knew this and prescribed half an ounce of Mist. Ammon. Brom. ex aqua, tds, to continue the influence of the teacher after the consultation was over. The lesson of Pentecost is plain: the teacher speaks with a tongue that is understood by all. "He said it would do me good."

"The main purpose of all my work" wrote Mackenzie¹² "has been to obtain a guide for treatment . . ." The days when a doctor could do little for his patient at home except watch and pray, or watch and bleed or purge, have now gone. New drugs, new tests, new teaching keep more and more people out of hospital altogether. New help in the practice from nurses and health visitors can help the doctor to keep more people where they want to be—well and at home. Our patients are universal students of their own bodies. They can never have enough of 'doctor's' time. The general quest for medical information will constantly increase, not decrease, the work of the doctor as teacher—a factor which was not foreseen through the rose-tinted spectacles of 1948²² or 1957²³.

Mothers as well as medical students can appreciate a view of their

children's reddened and painful ear drums, or listening to a foetal heartbeat. There is a forgotten magic in learning by the five senses, which drove Mackenzie away from London back to St Andrews, away from the cardiogram back to looking and listening. We cannot do without the cardiogram and its cousins, but neither can we do without looking and listening and thinking. Each one of us in medicine has an incessantly questing pupil trotting at our heels. If the teacher tires or falls asleep, the pupil in us will stop asking questions and will learn no more.

The future of research and teaching in general practice

So what is the lesson of James Mackenzie's work? What is the future of research and teaching in general practice? Mackenzie's principal contribution to medicine was his scientific study of single patients over long periods in general practice. He tried to classify symptoms as Sydenham had tried to classify the constitutions of the years or as the —ologists up and down the country were trying to classify bacteria or rocks. His investigations on heart failure succeeded because, as the doctor of first contact, he had access to patients under a great variety of stresses, during or soon after the event. No consultant heart specialist could have done this initial research, because he would so seldom have been in attendance during labour, or in fever or after an accident. A whole range of other problems still remain unsolved because the doctors of first contact—general practitioners—are not making or recording the primary observations, not puzzling over their hidden meaning, not experimenting and analysing and publishing as Mackenzie²⁴ and Pickles²⁵ would have us do.

In the second half of the twentieth century we must go further than Mackenzie; we can no longer afford to wait for the appearance of symptoms. We know that some predisposing factors may remain symptomless, yet not undetectable. Clinical pathology, virology and serology have laid before us a host of microscopic or micro-chemical signs which may change long before the awareness of symptoms. Only in general practice can medical scientists easily establish that relationship with healthy men, women and children on which to build modern preventive medicine. For success in preventive medicine of the future will depend on improvements not only in *public* but in *private* health. Smoking, immunization, urine tests or cervical smears, even collisions on the road: all these demand that individuals as well as administrators play a part in prevention. The potential victim must share in helping others to help himself, before any triumphs are seen in the sector of personal health at all comparable with those of the public health service in preceding decades.

In future it will no longer be enough to treat only those who

seek our help. We must go out and seek for those who *need* our help. Asymptomatic and pre-symptomatic medicine must follow on from Mackenzie's search for early symptoms. Let us go back to first principles. The general practitioner looks after people living in families and in communities. He must learn to teach them how to preserve their health, not merely cure their ailments. The present evolution towards larger partnerships and group practices, some covering whole towns or rural areas, cuts the ground from under professional competition and eliminates some of the ethical difficulties in public education by local doctors. The general practitioner must lead the attack on private ill health, whether related to schools, work or play, marriage, childbearing or old age. How far may we involve a local community in the medical needs of "the people next door"? How much teaching may be carried out in and for groups of people with similar disorders? These are some of the ethical and practical problems of the next phase in general practice.

In a small but increasing number of practices, one or more family doctors are becoming deeply involved in data recording and data extraction—for example about virology, therapeutic studies, experiments in preventive medicine, operational research and the long term measurement of health and morbidity. A larger and increasing number of teaching practices will be needed with openings for registrars or trainees concentrating on vocational training. Amongst these will be a limited number of university practices, medically and otherwise overstaffed for teaching and research purposes.

Money may be scarce but doctors, especially good doctors like Briggs and Brown, could become even scarcer. Therefore everyone must be helped to train himself purposefully for the medical role best suited to his talents and the people's needs. One urgent need is for educational funds to train young doctors for research careers in general practice. The best trainees should be able to go on to a registrarship in general practice, just as a houseman can in hospital. In all other scientific fields, graduates are attached to a research team to learn and carry out research under guidance. Why not in general practice? The next generation of doctors should be able to go on from where we leave off, not from where we began. I hope the research and education foundations of this College may soon consider jointly awarding one or more James Mackenzie Scholarships for the study of research in general practice. Yet even now, there is still no established practice to which such a young doctor could be formally attached in order to study this aspect of research, as a young specialist might easily do in a university laboratory.

The Institute

Mackenzie foresaw the need for a new type of data recording and

extracting centre to carry over information from one generation to another. His Institute at St Andrews was an attempt—years ahead of its time—to study this problem. But Mackenzie lacked modern apparatus and technique. We must take up the challenge and devise new ways to solve even more complex problems than he envisaged. Mackenzie's plan has had to wait for widespread diagnostic bacteriology and particularly virology to make sense of so much infective illness; for biochemistry and cytology to discover ways of detecting pre-symptomatic changes in the tissues and fluids of the body; for epidemiology to embrace health as well as non-infectious diseases within its scope, and for electronics to provide the means of large-scale, long-term record storage and data extraction. His objectives were far ahead of the technical possibilities of his day, but not of ours.

To quote Sir James' nephew, Lord Amulree,²⁶ whom we are delighted to welcome here today, the "main objective of the Institute was to collect records for research purposes and to organize the collection of data in a more specific way than had been done before—there was a vision here of a collection of morbidity studies, starting in childhood. The staff held regular meetings to discuss problems . . . and invited others from outside to come for advice and help".

After the last war the building in which Mackenzie had started his Institute was sold and part of the funds were used to establish chairs of social medicine and of child health in St Andrews University. The Institute itself, however, was not wound up and still remains a properly constituted company, with its own address and letter heading. Lord Amulree has asked: "Did the Institute fail?" and has also, in the same article²⁶ from which I quoted, given his answer: "No—not really. There was no driving force behind it after Mackenzie had gone, but the principles behind it were sound, and its inspiration should continue".

Here then is the challenge to those who would call themselves Mackenzie's disciples. Can they respond to his inspiration? Can they now, especially through the College, provide a new driving force to bring fresh life and a wider range of activity to the Institute itself? There is for example nothing in the Memoranda and Articles of Association either of our College or of the Institute to prevent these two bodies joining forces to strive together for Mackenzie's goal. Indeed Section 12 of the Memorandum of the Institute gives us a positive encouragement to do so.

We must build together a new data-handling centre for research and teaching in general practice. Such a centre with its modern skills could overcome those technical problems which slowed up the work of the Institute; it could absorb and enhance the College's

Records and Statistics Unit, Epidemic Observation Unit and Research Advisory Service. This may seem at present only a pipe dream. We know it is technically possible but where could the funds come from? Money is scarce. The future of our research advisory service hangs in the same balance which failed to weigh up the value and importance of James Mackenzie's Institute. Is Dr Pinsent's work for the College to suffer the same fate of financial arteriosclerosis which caused the Institute to starve? Among those who now hold half the Nation's wealth is there no visionary who can lift his eyes up to the mountains, who can dream of adding also to the Nation's health? Of course money is scarce, but when we look at the huge sums now spent on anti-health—on overeating, overdrinking, oversmoking, overstimulation of all kinds—I for one do not accept that the country cannot afford good research and good teaching by family doctors.

President, as I come down from exploring Mount Mackenzie after retracing a few of his footsteps, I recall what my father once said to me about Ronald Ross' work on the transmission of malaria—that he had been looking for something he had never seen in places he knew not where, yet instantly recognized what he saw as what he sought. The truth is that the trained mind learns to understand the unexpected and to recognize what is new at first sight. Patrick Manson²⁷ summed up Ross' work in words which might well have been written about Mackenzie: "If men will pay the price necessary to gain and apply knowledge, disease is preventible. Part of that price is patient, laborious experimental work in the field and laboratory." I would only add that another part of that price ought to be paid by those for whom some disease has already been prevented.

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A fifteen year pattern of doctor-patient contact among 'static' general practice patients. C. D. BAKER. *Brit. med. J.* 1966. **2**, 106.

Dr Baker has analysed the doctor-patient contact in a two-man partnership over the years 1951-1965, with special reference to 'static' patients. These are defined as patients on the list of the practice from 1950 or earlier until the end of 1965. There were about 2,000 such patients amongst approximately 4,500 in the 15+ age group on the practice list on 31 December, 1965.

The figures (which exclude all maternity contacts) show that 'static' patients have a lower morbidity requiring less medical attention to the extent of one-third of an item of service per annum per male patient, and three-quarters of an item of service per annum per female patient. Even so, their requests for medical care have risen by 75 per cent over the past 15 years, the greater part of the increase being in the last five years. This increase is spread evenly over the whole age-sex range and is not exaggerated by large demands on the part of a few patients.