

**Summary**

Aberdeen medical students were asked by questionnaire what they intended to do when qualified, why they had chosen a particular specialty, and where they planned to practise. This paper is based on the answers of 223 students in the second to the fifth years of study.

There was considerable variation between students in different years in respect of sex ratio and place of upbringing. The social background of these medical students is shown to be predominantly professional.

A majority of both junior and senior students had either made a definite choice of specialty (including general practice) or had developed a special interest. One out of every three British students intended to enter

general practice; most overseas students wanted to train as soon as possible for one of the specialties urgently required in their own country. Some of the factors associated with the various patterns of interest are described.

Nearly one out of every four British-born students said they were considering going abroad to practise, and the countries most often mentioned were Canada, U.S.A., Australia, and New Zealand. Although the prediction value of such statements is obviously uncertain, these intentions reinforce current concern about medical emigration and support the need for an objective national study of the reasons why so many students and graduates wish to practise abroad.

## SOME REFLECTIONS ON MEDICAL EDUCATION AND TEACHING IN THE DEVELOPING COUNTRIES

BY

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The following article embraces the subject-matter of talks and discussions on medical education and teaching held during 1961-2 at various medical schools in East and West Africa, Egypt, Sudan, and Iraq.

By medical education and teaching I mean study and instruction in medicine in order to produce medical practitioners, but the scientific and cultural aspects must not be forgotten. Although the two aspects on the training of a doctor—education and teaching—cannot be divorced, the former tends to lay emphasis on the intellectual features of medicine as part of the whole corpus of knowledge—for example, its relation with other sciences and the humanities and the development of the faculty of judgment—whereas the latter tends to imply instruction in current technical methods. Medical education must include some practical training and medical teaching should include some broader philosophical aspects. Historically the training of medical men from the earliest times has had a cultural association, particularly with religion. Thus the witch-doctor (with his psychosomatic associations) and the priests of ancient times (with access to the gods of health) tended to underline the importance of medicine as an art or mystique rather than the application of pure techniques. In the mediaeval universities medicine became identified with studies conducted in the intellectual atmosphere of a university (the unity of scholars), and it has so held its place right up to modern times.

It should be noted, however, that in England this was not always the case, for methods of instruction were by the apprenticeship system supervised by the various professional bodies of physicians, of surgeons, and of apothecaries, quite divorced from university life. Indeed, even during the last century there were few university graduates practising medicine in London, most of the profession being licentiates of the various societies or colleges. Towards the end of the last century, however, the training of medical students became finally regularized when all medical schools came under the jurisdiction of the universities.

It would seem that throughout the world the profession of medicine tends to be recruited from that part of the intellectual élite who are given a long and arduous university education and hospital training lasting some six to seven years. Originally this training was devised to make the doctor proficient in almost all disciplines, but with the rapid advance of medical science many new subjects have been added, so that the evolution of the curriculum has resulted in a multi-purpose training which lacks direction and is not in keeping with the times. For example, in Britain the student is drilled in the modern techniques of curative medicine as practised in hospitals, with little relation to preventive medicine or indeed to general practice outside.

**Medical Assistant or Doctor?**

At this point it may be well to pause and consider whether or not it is necessary for the general practice of medicine to recruit an intellectual élite for a long and costly course of education when the needs of society may well be served by training a basically-not-so-well-educated or a not-so-bright group (they are not the same) in the techniques of applied medicine. This latter is already in being in Tanganyika, Kenya, Uganda, and the Sudan, where medical assistants receive a four-years training at special schools for service in country districts. Similarly, in Russia many women are employed in general practice after a four-years course of training which resembles somewhat a nurse's training, with some knowledge of techniques usually performed by doctors. This form of medical assistant may well appeal to some developing nations who must husband their resources economically and in man-power for an interim period, particularly those with large but scattered populaces dependent on an agricultural economy.

I believe that this type of medical assistant has much merit, and he may be a useful supplement to the doctor who has been university trained. It is interesting, however, that the establishment of new university medical schools appears to be an integral part of the national pride of the new emerging nations, and wherever I have posed the question of choice between a school for medical assistants or a university school for doctors the answer has invariably been in favour of the latter. The general consensus is that medicine should be practised by university-trained men rather than technically trained medical assistants. This amounts to subscribing to a policy that it is better to have a few islands of excellence within a sea of mediocrity rather

than spread a nation's resources by raising the overall level only slightly (to quote Professor Ian Aird).

This policy has much to commend it, for university teaching centres can be the mainspring of the attack on disease and any advance made will have far-reaching results throughout a nation; it is unlikely that a medical service relying on technicians alone will advance the corpus of medical knowledge very much.

### Integrated Curriculum

If these premises are accepted, how then can we adapt our curriculum to be in conformity with the times? To my mind there are three main factors to be taken into account. They are (1) the increasing complexity of medical knowledge and techniques; (2) the changing aspects of society, due to increases not only in population but also in education and industrialization; and (3) the increased demand for more doctors as a consequence of (1) and (2).

The three aspects cannot be divorced, but special mention must be made of the first. Medical know-how has attained such a state of specialization that it is impossible to train a doctor in depth for any one of the branches of medicine until the postgraduate stage.

Unfortunately in many medical schools there is strict adherence to the traditions of former days involving a long and arduous training in (say) anatomy and operative surgery, with many other bits and pieces of new specialties stuck on, and resulting in a confused and badly orientated end-product. The answer to all this lack of direction—adherence to a revered but outmoded art and accretion of new subjects—is to go back to the principles underlying a university training; it is to educate a man so that he may have the intellectual armamentarium to meet life as he finds it. This is particularly important at this time, for we well know that many of our ideas of biology, health, and disease are changing so rapidly that in a few years' time even our mode of living itself may not be recognizable as we know it to-day.

It seems to me, therefore, that our main object in training is to give our students the intellectual equipment to meet this challenge of our technological society. How? By scrapping traditional ideas and making the main emphasis in medical training on the basic medical sciences and integrating the lot. Thus, after a preliminary year of general science, including statistics and scientific method, the medical course of six to seven years should then consist of the integrated subjects of biology (including genetics and microbiology), anatomy (including morbid anatomy), physiology, biochemistry, and medical physics as a central core of subjects *extending throughout the whole course* of training. Grafted on to this should be the essential knowledge of general surgery and medicine with some instruction in obstetrics, psychology, and preventive medicine and public health. The niceties of special techniques for special departments should be excluded except as elective courses or left to later postgraduate studies—for example, the pre-registration (U.K.) or internship (U.S.A.) year. Parts of this sort of integrated course are currently being experimented with by the new University College of Rhodesia and Nyasaland, and at the Middlesex Hospital in England the study of biology penetrates the preclinical barrier to make its impact on later studies.

My second point about the changing face of society is an important one in countries such as Britain. Here more and more the hospital and specialist services are being called upon to the exclusion of general practice. This stems from many causes. A highly educated and sophisticated society is no longer content with "the-laying-on-of-hands" but demands a scientific and a highly technical form of diagnosis and treatment. Undernutrition and diseases of infection and parasitism have almost disappeared, giving place to diseases of old age or the unmasking of more subtle diseases which demand highly specialized training for diagnosis. And finally the physical and psychological trauma consequent on the rapid development of a modern technological society brings its demands on medicine to counteract the inevitable danger to the race.

The answer as far as medical education is concerned is to rely again on basic scientific education to condition the doctor to these new situations so that he can tackle new problems scientifically and not to carry out the rituals of a former period—to wit, those he learned during the period of his training at medical school. Further, the development of "social medicine," with all its implications of making man fit to live within his environment, would seem to me imperative.

In the developing countries to-day the conditions, based as they are on an agrarian economy, are not the same as in Britain. None the less the expansion both in population and material wealth and education will be rapid, and in not too long a time they will be faced with some of the new problems we have in Britain. Taking the situation now, I would have thought that emphasis on the integration of the basic medical sciences throughout the curriculum was essential, with a discarding of some of the more elaborate techniques of medicine and surgery and their substitution by preventive and public health and social medicine. Some knowledge of surgical and medical first-aid for casualty is imperative, but it is more important to have a thorough knowledge of (say) bilharziasis than of urogenital surgery and of nutrition than of cardiac catheterization. I use these examples somewhat in exaggeration, but I hope they make my point.

My third point involves the increased demand for more doctors which is a consequence of the changing aspect of medicine and society. The problem here is how to handle large bodies of students efficiently so as to educate as well as instruct. One basic idea is that the medical school should be an integral part of the university hospital and not an accretion stuck on the outside. All basic-science departments should be housed in one building and not dotted about, and should have easy access to the hospital or even be built into it. The hospital should have ample provision for students in the way of demonstration theatres, side-rooms, laboratories, and tutorial rooms.

Another suggestion is the use of modern adjuncts to teaching such as two-way television. This is now well tried, and can be used not only in an undarkened room to instruct large numbers of students so that they may observe macroscopically and microscopically, but also to observe surgical operative procedures as well as patients in psychiatric and out-patient clinics. Further, a hook-up between hospitals may make it possible to display interesting cases to a large audience as well as increase the availability of necropsies for demonstration

in a country where permission for post-mortem examination is difficult to obtain.

The medical student should be treated as a scholar, otherwise he should not be at a university. An adaptation of the idea of student cubicles where a student has his own desk, books, and locker may well prove fruitful, particularly as they lend themselves to the use of the new teaching machines, which, though still in the experimental stage, are likely to be very useful.

The present pathological museums may be replaced by general medical museums with a synoptic presentation of disease as pioneered by the Wellcome Museum of Tropical Disease in London. Under this system a medical museum would consist of (say) 100 sections, each section dealing with one important aspect of disease. Thus "tuberculosis" would illustrate by diagrams, photographs, x-ray films, and specimens the aetiology, epidemiology, diagnosis, pathology, treatment, and prevention of the disease in its various aspects. All departments (under a museum director, probably a pathologist) would be responsible for the constant supervision of such exhibits so that the museum would not be a repository for dead specimens—and dead thinking—but would keep in step with modern advances.

Clinicopathological conferences may be used as a stimulating method of instruction to large numbers of students and staff. Here all disciplines would be represented and the student would be made to appreciate the patient as a whole rather than one small specialized aspect.

One of the objects of university education is to make students think, and it is difficult to do so if there is no personal relationship between teacher and taught. This is precluded in large classes; therefore, except for lectures, clinicopathological conferences, and special television demonstrations, as devised by the Pennsylvania State University, this must be achieved by splitting classes up into groups of 15 to 20.

In the clinical field this can be done by utilizing other hospitals, as in England. If it is accepted that only general medicine and surgery rather than specialized and erudite techniques are to be imparted to students, then there is no reason whatsoever why consultants of other hospitals should not be allowed to instruct small groups of students in their wards. This association with the university hospital inevitably raises the status and the standard of the non-teaching hospital, which is in itself a desirable object.

With regard to the basic sciences the splitting-up of large classes into groups is difficult but not impossible, especially with the use of television. Inevitably there has to be an increase in staff. Medical education is expensive, and Governments who embark on an expansionist programme must be made to realize this.

However, several countries have improvised by utilizing senior students to instruct junior students. This has a double advantage, for teaching helps in the learning and understanding of a subject, and a small stipend to the student may help to ameliorate his impecunious lot.

In France and Malta practising physicians and surgeons at the university hospitals also teach physiology and anatomy, and this doubling-up of duties helps to economize on staff and preserve a continuity of instruction which is invaluable.

### Two Types of Doctor

At this stage, may I make a suggestion for a revised concept of medical training? I believe there should be two types of doctor—the general practitioner and the specialist. I believe that medical students should receive a training for four years only, as in any other university faculty, and then be ready to do general practice in the field or to continue his studies in the specialty of his choice and take higher degrees. Such forms of career structure are found in almost all other professions and other university faculties, and I believe that there is no reason why medicine should be different. In the four years leading to a bachelor degree the basic medical sciences would be at the core of the curriculum, together with adequate instruction in clinical medicine (i.e., diagnosis and treatment, with a particular knowledge of simple emergency procedures).

The new curriculum in Paris—in which the student as early as his second year would attend clinics (at both hospital and district health centres) in the morning, and receive instruction in the basic sciences in the afternoon—may well be adopted. Such graduates would be well able to cope with health and disease in the general populace as well as have sufficient knowledge to know when to refer patients to hospital for more specialized treatment. This would relieve hospitals of much unnecessary work and the Government of expense, with regard both to hospitals and to the training of doctors. Upon this we can build our postgraduate training.

These ideas may not receive much support to-day, possibly because of our pride in the traditions of our profession, which recoils at any suggestion of possibly debasing the coinage, and from the slow official recognition of what is already fact.

However, I believe that my suggestion is a compromise which will produce large numbers of general physicians trained adequately to cope with the general problems of medicine and allow of the postgraduate training of a cadre of specialists. Such methods of training may well be investigated by rapidly developing countries.

Finally, in developing countries it may be well worth while to consider whether or not it would be more economical to support the doctors already there, with better ancillary services, e.g., medical assistants, nurses, technicians, radiographers, and equipment. If this latter were adopted, perhaps present services could be made more effective rather than resources being strained by training, at great expense, a large number of medical men who have little chance to utilize their advanced technical skill on the hordes of patients within the empty shells of hospital and polyclinic buildings.

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Money raised in New Zealand during the recent public appeal by the Royal Australasian College of Surgeons will be used to institute courses in basic medical sciences in Auckland and in Dunedin. The two courses will involve the expenditure of approximately £4,000 each year. Facilities for the teaching of anatomy in Auckland will be newly instituted and the present teaching arrangements in Dunedin will be greatly strengthened. The total amount collected in the appeal with a target of £300,000 was approximately £305,000. In New Zealand £57,000 was raised with a target of £40,000.