TALKING POINT

What to do about basic medical science

DONALD S McLAREN

The few remaining medically qualified preclinical teachers and medical students in the UK and the USA are dissatisfied about the state of basic medical science.¹⁻⁵ Clinical teachers are largely indifferent to what goes on in the medical school,⁶ and in Britain they are preoccupied with their own problems about pay and conditions of service.⁷ Most administrators seem equally unconcerned,⁸ though this may stem from their abhorrence of any attempt to rock their institutional boat. Judging from their silence in the debate, non-medically qualified preclinical teachers are contented.

The reasons for preclinical medical teachers' dissatisfaction are well known: low pay, exclusion from patient care, lack of relevance and integration, and the division of preclinical and clinical instruction. Newer medical schools have avoided some of the problems and innovation has been greatest in the early years. Most doctors, however, are trained in the older schools. Various attempts at horizontal and vertical integration and the interspersing of behavioural sciences and clinical correlation in the preclinical years have left the basic science departments intact. This is the root of the problem. The 1858 Medical Act gave rise to the departments and converted a trade apprenticeship into an education.⁹ The university has come to rely on them to teach non-medical students and to prosecute general research, a responsibility detrimental to achieving the objective of medical education.

Service to the community—in this country through the NHS—plays a greater part in the medical faculty than elsewhere in the university. Medicine is both art and science, or better art, technology, and science. This tripartite concept conforms well with the three domains of educational objectives: affective, psychomotor, and cognitive.¹ One dean laments "our concern above all things with the transmission of knowledge, relatively little with teaching the appropriate skills, and hardly at all with the attitudes of our graduates."³

It is wrong that students should spend their formative years without engaging in any service work, for this will dominate their professional lives. Long hours spent in laboratories are unpopular with students: what they do there is largely irrelevant to doctoring and usually not examined. It is tragic that the less academically inclined are eliminated by what is generally considered to be the hardest examination to pass at this stage without any reference to affective qualities or technical skills. "A letter to Edinburgh professors by a medical student," dated 1890,¹⁰ is a *cri de coeur* of such a student which comes across almost a century of injustices.

Very little of the "scientific method"¹¹ is learned in the preclinical years except by the few who do an intercalated honours year. In the United States the premedical phase may lay a firm foundation but it is under attack.^{5 12 13} In the UK there was no difference in performance between students taught only principles and others bombarded with the customary "facts."² Campbell¹⁴ argues cogently for more science, especially of the "stories of science,"¹⁵ and Nossal¹⁶ for better science.

Both are right if the emphasis and setting are appropriate. Feinstein¹⁷ points to fundamental differences between scientific procedures required for managerial decisions about sick people and those used in explanatory science.

Allegiance to research

In the UK and North America, most preclinical academic staff are not medically qualified and are quite unfitted to train doctors because of their narrow science specialty training. Many have heavy commitments teaching science undergraduates and supervising graduate research. Teaching medical students is often regarded as an irksome distraction. In the United States some have a PhD in basic medical sciences, which helps participation in integrated teaching. But the primary allegiance of the best of these scientists is to their "invisible college"—the peer group in their research interest.¹⁸ This spirit, laudable in a purely scientific setting, is inimical to the teaching of medical students. The university fosters defection to the invisible college with the "publish or perish" principle for advancement. Furthermore, by requiring teachers to "pursue and encourage research in the field or fields of study appropriate to their appointment" (a quotation from my own contract) it encourages trivial and bogus "research." Much of the research in industry and research institutes is no better but they do have some degree of accountability. The stimulus that true and appropriate research can give to teaching is often absent and then the only difference between such teachers and those in secondary schools is that the latter have to learn how to teach and the former do not. Lord Todd¹⁹ has argued that in Britain all universities cannot be centres of excellence and more should become primarily teaching institutions. The research contributions of preclinical scientists to medicine at present are authoritatively regarded as minimal.²⁰⁻²²

The inflexible administrative structure of the traditional medical school has been likened to "balkanisation"²³ and to "a collection of fortified sheikhdoms,"²⁴ constituting an insurmountable barrier to holistic and humanistic medicine.^{23 24} Curriculum committees are powerless to do much more than tinker with the timetable. The all-important details of student learning are left to the "experts," who are unlikely to have a balanced view of the importance of their subject in the curriculum as a whole.

What can be done? The basic medical science departments are anachronisms, and their disciplines do not form the historical or philosophical basis of medicine as is often supposed.²⁵ This was the view of at least one dean in 1967,⁶ and in 1973 Prywes stated, "It is already out of date to speak about physiology, biochemistry, pharmacology, microbiology or immunology."²⁶ This does not decry, of course, these departments' past contributions to medical science.

Traditional schools have to operate within their existing bounds but this should not preclude redeployment of their forces. Policy making, planning, and monitoring must be done by a body responsible for every aspect of teaching and if this is composed largely of heads of departments and their appointees the prospects for change are poor. Far from having a key part to play, the dean is more of a decorative pinnacle to the edifice than a chief cornerstone without which the building collapses.

Department of Physiology, University of Edinburgh Medical School, Edinburgh EH8 9AG

DONALD S McLAREN, MD, PHD, present appointment: reader in clinical nutrition, Department of Medicine, Royal Infirmary, Edinburgh

So long as the steady stream of doctors graduate he sees no cause for alarm or change. This laissez-faire approach brings disaster in business and industry but not in the academic world. It is difficult to know whether a medical school is satisfactorily achieving its objective in training good doctors but the objective can be defined. We need a representative body of teachers who are prepared to act in a disinterested manner so far as departmental matters are concerned and who are empowered to formulate and monitor the undergraduate curriculum.

Organisational marriage

The ingredients from which to make the appropriate mix already exist, with striking affinities between components of the preclinical and clinical layers. The basic science disciplines can be paired with clinical departments as follows: anatomy and surgery, physiology and medicine, biochemistry and clinical chemistry, pharmacology with clinical pharmacology or therapeutics, and histology with pathology. This organisational marriage should solve problems of pay, status, relevance, and the preclinical and clinical divide, and greatly strengthen the scientific basis of clinical teaching and research. It could also lead to a more realistic approach to the selection of medical students, encourage a new spirit of apprenticeship and graded responsibility in patient care throughout the curriculum, facilitate the introduction of learning systems more in keeping with health needs of the future,²⁹⁻³¹ and reduce the time needed to produce the basic doctor. It could do this by removing much that is irrelevant, allowing more attention to be given to postgraduate education. Undoubtedly some of the most conscientious teaching is preclinical. Clinicians often regard teaching as an impediment to their hectic patient care schedules. Common scrutiny might make this attitude less easy to get away with.

Basic courses in human biology are said to have grown in popularity² and were commended by the Todd Report.²⁷ New schools have adopted them and they are especially appropriate in the American system with premedical and preclinical divisions.¹⁴ Introduced merely as a reformulated academic discipline, they do not, however, serve the true purposes of the medical school. The merged departments could run a truly relevant human biology programme with help from sociologists, psychologists, community physicians, and general practitioners.

In the United States the falling numbers of MDs engaged in clinical research and their replacement by PhDs has been deplored.²⁸ This is not necessarily unhealthy as doctors are evidently increasingly seeing their principal responsibility as one of service, for whatever reasons. Scientific and technological advances increasingly demand knowledge and skills which undergraduate medical training does not and should not provide. The proposed merger would best take advantage of what appears to be an inevitable trend: employing PhDs with a primary interest in basic and applied medical problems in an appropriate teaching and research setting. It would not preclude, but rather foster, interdepartmental collaboration in teaching and research. It might be argued that the loss of the basic medical science departments would lead to downgrading of these disciplines in the medical school. In reality this is a fait accompli with the burgeoning of clinical departments and units since the second world war. The scientists can only beat the clinicians by joining them. Such a radical change would be far from easy to bring about and to live with. Good will, of which the medical school has more than a fair share, would be needed.

What are the prospects for change? On both sides of the Atlantic the present position of basic medical science education is beginning to be regarded in terms of "dilemma" or "crisis." More optimism is expressed in the United States^{5 13 14 32 33 36} than in the UK,^{4 6 9 34} where there has been more resistance to innovation. Pickering stated, "for the vast majority of medical students in Great Britain the medical curriculum is virtually as it was 30 years ago," and he criticised especially the first two years.⁴ Review of the literature suggests a preoccupation with

teaching methodology and details of curriculum change rather than with fundamental principles.

Prywes predicted that departments of medical education would be increasingly established, providing the leadership for change.³⁵ They remain rarities and are often regarded as a threat to the status quo. It is the responsibility of all concerned, especially students, to press for change. The report of the Illinois group, pioneers in medical education, concludes that "the greatest impediments to change are found in the heart, not in the purse."³⁶ The threat of swingeing budgetary cuts only leads to hardening of already entrenched attitudes and any resultant changes leave fundamental issues untouched. This is the contemporary scenario for the future of medical education in London.³⁷

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