A good doctor and/or a good scientist? The medical academic’s mid-life crisis

Medicine has progressed by integrating scientific discoveries with good medical care and the physician scientist has played a central role in bridging the gap between clinical practice and scientific research. As a physician with a busy practice, Harvey ‘professed to learn and teach anatomy not from books but from dissection, not from the tenets of philosophers, but from the fabric of nature’ [1]. His momentous ‘invention’ of the circulation of the blood and of the function of the heart stands as a classic example of the integration of science and medicine. The natural histories of diseases were described by practising doctors such as Sydenham, Snow, Budd and Ross by carefully observing their changing clinical features over time [2].

As the practice of medicine became centred on hospitals, and science became institutionalised in the laboratories of universities, physicians and scientists began to collaborate more closely. Bernard, who recognised the importance of experiment as well as observation in medical science, ‘urged the physician, jealous of the title in its scientific sense, on leaving the hospital to go to his laboratory and thereby experiment to seek to account for what he had observed in his patients’ [3].

The place of research laboratories in hospitals is now well established; there physicians and scientists can work side by side, as colleagues or embodied in the person of the physician scientist. This century has seen the discovery, development and use of insulin, penicillin and effective vaccines through collaboration between physicians and non-medical scientists. Many discoveries which have been fundamental to medical advances were made by scientists such as Pasteur, and Watson and Crick, working independently of physicians.

The conflict

Can physician scientists survive in the world of modern research? Have they been displaced by the labora-
tory scientist? Can they still span the gap between medical practice and clinical research? Gill lamented their passing in North America [4], but Weatherall has argued that, although endangered, they are far from extinct [5]. While reminding us that practical medical discoveries have arisen as much from the work of the curious physician as from that of the basic scientist, Weatherall admits that the task required of the present-day physician scientist who wishes to maintain mastery of both clinical practice and research is formidable [5].

The task, which begins on entering university or medical school, at first seems relatively easy. Preclinical medical education, which should offer a wide introduction to the biological, physical and social sciences, floods the medical student with facts and ideas from which a general body of medical knowledge is formed. Trained and repeatedly tested in the early years after qualification, the young doctor quickly becomes clinically proficient and obtains the diplomas necessary to follow a career in hospital medicine. This can be an exciting and intellectually fulfilling period at the workplace of clinical medicine.

What follows for the physician seeking to pursue a career in academic medicine can be equally absorbing. Immersion in a well planned project leads to the acquisition of scientific techniques and method, culminating, if all goes well, in an MD or PhD degree. Completion of the thesis marks the end of these consecutive periods of training in clinical medicine and research. The aspiring physician scientist then has to face the challenge of combining the two in his career.

Contrasting frames of mind

The practice of medicine and the pursuit of research require not only two different settings, but also two different frames of mind. Uncertainty surrounds much of medical practice: diagnoses must frequently be made in the absence of ‘complete evidence’ and choice of treatment is often empirical, based on earlier experience. Intuitive judgement of what is likely to be the case may be as important as hard facts in making a diagnosis and planning treatment. Pressed by the necessity of making decisions, clinicians must accept uncertain, incomplete ‘proof’ in order to prescribe treatment.

Scientists, in contrast, positively encourage open-mindedness. Certainty is constantly under attack in the critical questioning not only of the work of other scientists but also of their own. They are mainly sceptics and are committed to careful measurement of reproducible phenomena. They can never be satisfied that they have assembled all the evidence to support their conclusions.

Physician scientists must attain the confidence of

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their medical peers and the credibility of their scientific colleagues: they must retain respect in two cultures with different goals and expectations, and master the complementary skills and frames of mind that allow them to move comfortably between ward and laboratory. The difficulty of moving between the ‘two types of mind’—which Pascal called the intuitive and the mathematical—has long been appreciated [6]. Moving from the ward to the laboratory requires a change of this state of mind, and in this shift lies the danger of practising pedantic, over-investigative medicine, or of doing sloppy, half-baked science. To do both well is a hard task. But with increasing responsibilities in each, physician scientists encounter another insidious but potentially fatal demand.

The crisis

Like so many crises, its nature is not immediately apparent. At first the fledgling physician scientists are propelled by unfinished research projects and new developments in their field, using familiar techniques. But if they are also good doctors, their clinical skills will be in increasing demand and commitment to patients will take up more and more of their time.

At the same time budding physician scientists will also be expected to build up a research group of scientists from different backgrounds and to train and teach young doctors and scientists. Time for hands-on work in the laboratory quickly vanishes and has to be given to writing grant applications, letters, lectures, memoranda, reports, references, reviews, and even original articles, between interruptions from meetings and telephone calls. Paperwork overwhelms the full process of scientific research—the development of the idea, the design of the project, the execution of the experiments, the analysis of the results. Most of the feedback and interaction between them will be left to the juniors of the team and the physician scientist can expect to enjoy perhaps no more than five years of active personal research before the crisis looms and the competing demands of clinical care and research management close in and extinguish originality, inspiration and creativity. The ability to maintain both frames of mind, and to make imaginative connections between practice and research depends on having the time and opportunity to do these things.

After 10 or more years spent mastering the practice of medicine, and of learning scientific method, the physician scientist is being turned into a research administrator, with involvement in the management of clinical services and, if working in a medical school, in both undergraduate and postgraduate teaching. Competence at financial planning, personnel management and communication will be expected and the laboriously and assiduously gained skills of being at once a good doctor and a good scientist, will atrophy through disuse. The physician scientist will be regarded by the medical school or research council as a doctor and a scientist whose concerns must be only medicine and research, and even though the day-to-day activities of these jobs have become administrative and managerial, additional support and extra resources will not be forthcoming.

So the conflict becomes a crisis. The physician scientist is expected to observe, to experiment, to care for patients and to administer. Trained physician scientists make poor secretaries and their talents are wasted on administration and management. So what are the ways out of this crisis?

Solutions?

An obvious solution to this crisis is to concentrate on either clinical practice or medical research and to retain no more than a token commitment to the other. In many teaching hospitals senior lecturers and other senior academic medical staff spend little time in the laboratory. The pressures of providing a clinical service, particularly if the physician scientist is the only specialist in that field, mean that even ‘protected time’ to do research becomes merely notional, and scientific work all but ceases.

Alternatively the physician scientist may relinquish clinical responsibilities to junior staff and do no more than offer specialist opinions on research related clinical problems before turning to the laboratory and there seeking refuge in the world of pure science. Either of these solutions may solve the crisis, but they make it less likely for the physician scientist to continue to bridge the gap between ward and laboratory and to do productive research directly related to clinical practice.

Another solution is to abandon or delegate all managerial and administrative responsibilities. This is possible only if sensitive administration, efficiently responsive to the changing needs of the research group is constantly and immediately available. Such an administrator should be something between a personal assistant and a private secretary. It is rare that the university or research council will recognise, let alone consider such an expensive option.

A fourth solution is to keep the research team very small and with a highly focused interest, closely related to the clinical concerns of the physician scientist. The laboratory then becomes the place to develop new techniques applicable to problems posed in the ward or clinic. This is a well tried and effective solution.

Conclusion

The midlife crisis of the medical academic happens during the potentially most productive years of life. If it is not resolved then a unique contribution to medical science, just at a time when it should be blossoming, is lost, and the many years spent in reaching the point of flowering are wasted.

If the crisis is not recognised and faced, ‘burn-out’
follows. This can take the form of exhaustion or boredom. Goldstein argues that the 'paralysed academic investigator's disease syndrome' [7] can be prevented with a good basic science training, and the exercise of what he calls 'technical courage'. By this he means the flair, confidence and creativity to see the connections between practice and research and to apply new methods to solve clinical problems. He proposes the simple formula: clinical stimulus × basic scientific training = fundamental discovery. The elements of this equation can be provided, but preservation of that flame of originality and the conditions in which the physician scientist can work imaginatively and productively is more difficult.

The crisis can be solved by admitting that modern medical research, which requires team work and a high level of technology, also depends on the survival of both the person and the complementary frames of mind of the physician scientist. To survive, the physician scientist must be adequately supported to prevent clinical and research work from being crushed under the weight of administration and management. If such support is not forthcoming, this endangered species will become extinct and the only figure that can effectively straddle the gap between medical practice and research will vanish.

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