COMMENTARY

Perspectives

Who was that guy?

Eliot A. Phillipson, MD

Sir John and Lady Eaton Professor and Chair, Department of Medicine, University of Toronto, Toronto, Ont.

Clin Invest Med 2002;25(6):257-9.

One day, a few years ago, 2 patients sat waiting in the outer common office that I shared with a colleague. One patient, waiting to see me, was a visiting well-known conductor of a symphony orchestra; the other, waiting to see my colleague, was a star baseball player with the Toronto Blue Jays. Word quickly spread throughout the hospital corridor that the Blue Jay player was in the waiting room. Within minutes, several other physicians and their secretaries found it "necessary" to visit my secretary, and while in the office, they took advantage of the opportunity to ask the Blue Jay player for his autograph. All of them ignored completely the famous musician sitting next to the baseball star. Every time the door to my inner office opened, I was able to witness this scene. When I finally called the musical conductor into my office, I asked him if he had ever been so completely upstaged. "Oh," he replied, "I didn't mind being ignored — but who was that guy?"

The complete lack of recognition between celebrities from the world of classical music and the world of professional sport is perhaps amusing but not particularly surprising or disturbing. On the other hand, if the 2 individuals in the scene had been an outstanding scientist from a basic science department and a leading physician from a clinical department in the same medical school, would we still be simply amused, or would we be concerned that the lack of personal recognition perhaps reflected a deeper lack of interaction and communication between the basic sciences and clinical disciplines? This question is not as hypothetical as it might seem. Of particular concern is that, at least in some medical schools, the role of basic scientists in the education of physicians appears to have diminished considerably in recent years. This change is related to a combination of factors, including the advent of problem-based learning (PBL), the increased emphasis being placed on the psychosocial determinants of illness and corresponding decreased emphasis on basic science, and the perceived failure of the "biomedical model" to fully explain or eradicate disease. Whether the declining role of basic scientists in physician education is happening by design or "neglect" is not clear, but the transformation is of sufficient importance and concern that it warrants thoughtful attention.

In addressing the issue, it is important to distinguish 2 related but distinct considerations: first, the importance of basic *science* in the education of future physicians; and second, the role of basic *scientists* in the medical education process. It might be assumed that the former is largely rhetorical, and that the importance of basic science in medical education is well established and beyond debate. Although few would argue otherwise, there is considerable debate regarding the *degree* to which medical students (undergraduate and postgraduate) should be exposed to basic science. In this regard, readers will recall that one of the driving forces underlying revision of undergraduate medical curricula in the 1990s was the need to decrease "fact overload," particularly facts that were perceived as being "irrelevant" to clinical medicine. Rightly or wrongly, many of the facts considered to be "irrelevant" were in the basic science disciplines. These notions were further enhanced by an emerging awareness of the dominant role of non-biologic factors as determinants of *health*, and the conclusion that the biologic determinants of *illness* were therefore less important for medical education than was the case previously.[1]

Although no one would debate the need to remove "irrelevant fact overload" from the medical curriculum, the apparent downgrading of the basic sciences in medical education (intentional or otherwise) is a trend that appears to be headed in the wrong direction. In fact, it can be argued that the need for physicians to be familiar with basic science has perhaps never been greater, given the impact that our knowledge of the molecular basis of life is beginning to exert on the clinical practice of medicine. Indeed, over the next few years, recent advances in basic science will pervasively and profoundly transform the practice of medicine. At minimum, therefore, if physicians of the future are to be clinically competent, they will have to be fluent in the language and the concepts of basic science. By way of analogy, if we accept that an understanding of the basic electrophysiology of the heart is a prerequisite for clinical interpretation of the electrocardiogram, or that familiarity with the mechanisms of sodium reabsorption and excretion in the kidney is necessary for the proper use of diuretics, then it is equally true that an understanding of the functions of oncogenes and tumour suppressor genes will be necessary in assessing the clinical significance of "cancer gene" mutations that are identified by population screening programs.

Thus, far from basic science being "irrelevant" to clinical medicine, its importance has arguably never been greater. The potential danger of downgrading basic science in medical education is a return (at least in part) to a pre-Flexnerian model of medical education, in which clinical medicine lacked a strong basic scientific underpinning. If basic science has sometimes been perceived as "irrelevant" to clinical medicine, the problem has perhaps not been in the science but in the context (or lack of it) in which it was taught. For example, atmospheric science taught in isolation may not seem particularly pertinent to clinical medicine, but it becomes immediately relevant when the hole in the ozone layer is discussed in the context of the biologic effects of ionizing radiation and the increasing prevalence of malignant melanoma.

If we accept the continuing and even increasing importance of basic *science* to medical education, then the second consideration can be addressed; specifically, the role that basic *scientists* should play in the education process. On the one hand, it can be argued that the "relevant" basic science can best be taught by clinician-scientists who are involved in both basic scientific research and clinical medicine. Indeed, one of the unique attributes of clinician-scientists is their ability to bridge the bench-to-bedside gap by bringing the advances of basic science into the clinical domain in a format that is comprehensible to physicians and relevant to patient care. Nevertheless, even if there were sufficient numbers to do so, the role of the clinician-scientist in medical education was never intended to replace that of the basic scientist, any more than it was intended to replace the role of the clinician-teacher. On the contrary, several arguments can be made for the direct exposure of medical students to basic scientists. First, since one goal of medical education is to stimulate some students to pursue careers in basic science, it is obviously important that they be exposed to basic scientist role models. Second, and perhaps more important, although the majority of medical students will not be pursuing careers in basic science, it is nevertheless important that their critical thinking skills be influenced by contact with scholars in the basic science disciplines, in addition to scholars in the clinical, behavioural and community health disciplines. If we believe that medical education is indeed an *education* and not merely a form of trade school job training, on what basis would we deny medical students exposure to the community of scholars housed in our basic science departments? To deny such an exposure is a lost educational opportunity. Would we be willing to condone a situation in which students in English courses were denied an opportunity for exposure to the best scholars in the discipline simply because the majority of students might not be planning academic careers in the subject? To do so would be to negate the fundamental concept of a university education. The exposure of medical students to basic scientists will help to broaden their vision and will deepen their understanding of the origins of much of clinical medicine. It is worth remembering that the "evidence" of evidence-based medicine usually begins with basic science, not clinical trials.

Given these considerations, the debate for acade-

mic medicine should not be whether it is important for basic scientists to be involved in the education of future physicians, but rather what is the most effective model for such involvement. If, for example, basic scientists are reluctant to serve as tutors of PBL, our challenge is to design a more suitable format for their participation. The problem, it would appear, is not so much the practical detail but rather the need for the fundamental importance of such participation to be rediscovered and reinforced by faculties of medicine, including the basic scientists themselves.

In summary, it is an overworked but nevertheless true cliché that the most effective physician is the one who has mastered both the art and the science of medicine. Much of that science, it should be recalled, is basic science. As noted previously,[2] the advances in clinical medicine of the 20th century were rooted in discoveries in the biologic and physical sciences. By every indication, this basic–clinical relationship will become even stronger as we enter the era of molecular medicine. Let us hope, therefore, that the day never arrives when the graduates of our medical schools, upon meeting a basic scientist from their university whose work has made an impact on clinical medicine have to ask, "Who was that guy?"

Acknowledgements: This text is adapted from one previously published in MediNews, The Newsletter of the Department of Medicine, University of Toronto, vol. 11, no. 3, December 1998.

References

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Medical subject headings: basic science; clinical medicine; clinician-scientist; education, medical

Correspondence to: Dr. Eliot A. Phillipson, Department of Medicine, University of Toronto, Ste. 3–805, 190 Elizabeth St., Toronto ON M5G 2C4; fax 416 978-7230; eliot.phillipson@utoronto.ca