

Editorial

Darwinian evolution or regression? The fate of laboratory professionals

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Medicine is the science and art of healing, traditionally based on a broad array of healthcare practices to prevent, mitigate and treat illnesses. Medicine is also one of the ancient sciences; some prehistoric medical practices have been discovered in ancient Egypt, in Babylonia, in the Indian subcontinent (i.e., Ayurvedic medicine), in China, as well as in ancient Greece and during the Roman empire. The art of medicine has hence evolved in parallel with incessant advancements in other “sister” sciences, such as biology, physiology and, last but not least, with technology. However, there has always been a sense of continuity between the superstitious mental complex of the primitive man, endowed with amulets, disease demons and healing gods, to a more rational approach, based on rationalism and evidence-based methodology for managing human disease. This has inevitably led to the development of thousands of diagnostic tests, complex therapies, and sophisticated instrumentation to preserve health and try to extend the quality and – contextually – the quantity-of-life far over the contemporary biological limit.

While healthcare remains among the leading (if not the first) priorities of all Governments worldwide, the rate of medical staff departures from active practice, which has not been efficiently counterbalanced by the enrolment of new doctors, is reaching epic proportions, outstripping the ability of universities, training programs and hospitals to respond. This alarming phenomenon is not surprising, nor it can be considered really new. In 1945, William H. Sinkler claimed in the *Journal of the National Medical Association* that “there is a woeful lack of physicians, particularly in the small communities and throughout the rural areas” (1). At that time, he had already proposed some valuable solutions to deal with this problem, such as increasing the facilities for a larger enrolment at both civil hospitals and medical schools by a more liberal admittance policy for students. In an article published in this issue of *Clinical Chemistry and Laboratory Medicine*, Phedias Diamandis reanalyzes the (even more)

alarming shortage of physicians in the 21st century, re-emphasizing the concept of “*struggle for life and admission to medical school*” (2). In his comprehensive analysis, the already existing shortage of vocations is believed to be further worsened by the current restriction on enrolment in medical schools, such that only a fraction of applicants can be accepted. It is also highlighted that not only number, but also the quality of physicians might be a serious problem for the future of healthcare and scientific research as well. The application process also poses selective pressures and is rather arbitrary, allowing the selection of a small fraction of applicants, often independently from the applicants’ suitability for the medical profession. Notably, and in agreement with the Lamarck’s theory of adaptive selection, the vocation to become a physicians seems to follow a kind of genetic transmission dictated by acquired skills and knowledge of working in the very same field, a theory supported by the evidence of a constantly increasing proportion of medical students with physician parents. As such, skilled students, whose inspiration is the art of medicine, might be turned away because of these uncontrollable and seemingly irrelevant selective pressures. It is notable that one of the solution proposed by Phedias Diamandis recalls exactly that proposed by William H. Sinkler nearly 65 years ago, that is to increase the size of medical school classes, so that the process of pursuing medicine might return to the origin, being more fair to all socioeconomic and racial classes. More recently, Eleftherios P. Diamandis raised another serious problem involving the empowering of young scientists in Academy, thereby turning them away from clinical practice and research and further aggravating the shortage of skilled clinicians. It is provocatively pointed out that these highly promising young scientists should be better shielded at this stage of their career from Academic activities, and encouraged to devote all of their time, energy, creativity and focus on clinics and making important discoveries (3).

Some of the readers might now be persuaded to think that these two papers seem at least unrelated to the field of laboratory medicine. But this is untrue. The shortage of skilled physicians reflects a more general dearth of enthusiastic laboratory professionals, which is a becoming more and more evident as time passes, boosted by the predictable disparity between large test volumes, decreased vocations, and cost-containment policies (4, 5).

A recent paper dealing with the recruitment and retention of clinical laboratory professionals in the US also empha-

sized the impressive reduction in the number of clinical laboratory science programs, resulting in fewer and fewer graduates each year (6). Between 1975 and 2005, the number of science programs decreased by 67%, despite a projected increase in employment opportunities, thus enlarging the gap between the increased demand and the decreased number of graduates. Will the solutions proposed by Phedias and Eleftherios Diamandis also be viable in the field of laboratory medicine? Although there is no simple answer to this question, increasing the number of students of laboratory medicine classes (i.e., increasing the number of specialized physicians and biologists, and skilled laboratory technicians) along with promoting their careers in laboratory activity and research rather than in academies, would definitely compensate the shortage and enhance the quality. However, the most important issue is related to the future of laboratory medicine, namely, if it remains an academic discipline or simply a commoditized production of results by focused factories poorly correlated and integrated with the clinical context (7–9). Data from the US data demonstrate that most of the science programs closed in the last few years were hospital-based, thus reinforcing the need of closer integration of laboratory services with the clinical pathways and other medical services provided by hospitals and healthcare institutions.

To date, the future of laboratory medicine is a kind of lottery game, where the chances of winning can only be raised by increasing the number of tickets you buy. The shortages of science programs and graduates may dictate the need for more drastic measures to assure a future for the discipline and quality of patient care.

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