

when it comes to long-duration space flight. Cosmonauts have experienced fatigue, asthenia, sleep disturbances, and depression. This is believed to be due to the isolation and confinement of space, as well as changes in circadian rhythms, as well as man-machine and crew interactions (4). Psychological and psychiatric problems that arise during long-duration spaceflight may in fact be the real limitations of exploratory missions.

Yet another problem is radiation (5). We have seen the effects of acute and chronic exposure to radiation on earth after tragedies like Chernobyl and Hiroshima. At this point in time, we have few tools to measure the amount of radiation one would be exposed to outside the atmosphere and magnetosphere, earth's protective layers, making it hard to estimate the cumulative exposure that would occur during an extended mission. Furthermore, the issue of radiation becomes even more important when we consider the immunosuppression experienced by astronauts. Proper measurements of radiation exposure as well as adequate shielding will need to be provided to decrease this risk to an acceptable level.

Human space exploration and colonization might be the key to assuring our survival as a species. We will face some great uncertainties in the coming centuries, like the availability of food to supply world's burgeoning population, the reserves of energy sources for our expanding economies, and the effects of pollution on our environment (6). Space exploration may seem like an extravagance now, but it may soon become a necessity. This is why we need to develop

aerospace medicine, so that humankind's leap out of its cradle will be a safe one.

Marlène Grenon, M.D.C.M.
Faculty of Medicine, McGill University

Carol Chahine
Faculty of Dentistry, McGill University

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The Association for the Development of Aerospace Medicine (ADAM) was created in August 1999 at McGill University. Additional chapters of ADAM are being created around the world. Please visit the ADAM website at www.ssmu.mcgill.ca/adam or contact Marlène Grenon at greno00@med.mcgill.ca for more information about the Association or about aerospace medicine in general.

ON THE MAKING OF TOMORROW'S PROFESSIONALS

Twin berries on one stem, grievous damage has been done to both in regarding the Humanities and Science in any other light than complemental.

William Osler (1)

Attribute it, if we shall, to the momentous growth of knowledge in our field of study, to the decreasing amount of time in a fast paced civilization, or even to the decay of youths' appreciation of culture, but the Science student of the early 21st century graduates with what many may judge to be less than a complete university degree. Permitting less than a handful of elective courses throughout the undergraduate career, many of our nation's top honors biomedical curricula have become so heavily specialized that it is not uncommon for students to complete their studies without having explored any course work outside the natural sciences. Students thus



Sir William Osler's desk. Photographer: Karen Coshof. Reproduced with permission from *The Osler Library* (Montreal: Osler Library; 1979).

lose the opportunity of diversifying their pre-medical background with such valuable subjects as Philosophy, Literature, and History. This stands inconsistent with the demanding prerequisites set forth by a majority of medical school faculty who have come to adapt their selection processes to the demands of an ever-evolving profession for more broadly educated candidates (2). Historically, such a problem provides sharp contrast to the intentions of the university's founding fathers, for whom a solid grounding in the Classics and an appreciation of the history of one's vocation was deemed essential. Indeed one may expand the comparison to Europe's original scholars who, it is said, had on their shelves "all of the knowledge which the human mind hath produced." If the next generation of physicians are to be equipped to face the ever-growing ethical, cultural, and moral issues surrounding the profession, while continuing the delivery of health care rooted in charity and sympathy, it is then crucial that premedical students develop and maintain an interest in non-scientific disciplines.

As a pupil of Science, I understand that the intricate nature of the subjects to which we devote ourselves does not allow us the liberty of reducing by half the number of concentration courses, nor of extending the length of the Bachelor's Degree to five years – indeed the latter suggestion would probably alarm more than encourage. Instead what I suggest is that modern Science students recognize what one or two courses per term in the Humanities and Social Sciences, supplemented by healthy doses of well-rounded personal reading, may do to enrich their overall education.

To those who sigh that our busy days won't permit it, I can only rebut with the truth that a more varied reading schedule can only enhance working efficiency. What better way to enliven a chapter on Organic Chemistry than by interrupting with an hour of Shakespeare, Milton or Montaigne? The wisdom and righteous principles to be gained from contact with these great minds provides young people with the refreshing inspiration and enlightenment so indispensable if one is to persevere through the rigorous scientific curriculum. Furthermore, apart from the immediate enrichment of one's student life, it has been shown that the study of Literature plays a crucial role in strengthening the "human dimensions of medical practice which are a central feature of the art of medicine" (3,4).

The Humanities are defined as those branches of learning that investigate human constructs and concerns as opposed to natural processes. Much can be gained from the valuable morals and principles contained therein. The encoded counsels I refer to in Philosophy, for instance, often represent the products of a humble scholar's personal pursuit of wisdom and intellectual

breadth, which are laid out for the young reader to discover "while the green years are on our heads." Regular contact with the founding fathers of Philosophy and Science – indeed many were both – provides students with models by which to live through timeless examples of integrity, patience, charity, service to others, and a love of duty and the day's work. In just the same manner, the rules of life are intrinsic to all of literature's good contemporary poetry, short stories and novels, for many an English Major will agree that writers look first to the irregular and intriguing facets of the human experience for their ideas, and it follows that profitable insight is sure to be found. Does it not seem logical that physicians would be more emotionally prepared to face, cope with, and counsel others on the constant realities of pain and death attendant to medical practice, if their long literary cultivation had trained their hearts in these matters? By the same token, does Shakespeare not crystallize the portrait of love in more than one timeless masterpiece? For Osler, the idea of the universal application of the Humanities was clear:

The love, hope, fear, and faith that make humanity, and the elemental passions of the human heart, remain unchanged, and the secret of inspiration in any literature is the capacity to touch the chord that vibrates in a sympathy that knows nor time nor place (5).

A progressive academic and personal pursuit of a liberal education during the crucial formative years of today's young minds offers them the potential to acquire the prerequisite intellectual equipment needed to serve their community in both their professional and personal lives. Especially for those aspiring to the vocation of answering the call of the sick and downtrodden, this complementary learning provides the compassionate appreciation of our human condition which is so crucial a supplement to the scientific knowledge upon which the physician's cure is rooted. And perhaps when prospective medical students ultimately perceive the connection between these disciplines and realize their direct value in this life when effectively combined, they indeed may admit to having found the wisdom they so sought in the beginning.

...if inquiry into all the subjects we have mentioned brings out their association with one another and draws conclusions about their kinship, it does contribute something to our goal and is not labor in vain...

Plato (6)

Danny Del Duca, B.Sc.
Department of Biochemistry, McGill University