

Commencement Address—2002

Science and Humanism: The Twin Pillars of Medicine

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I WANT TO THANK THE CLASS OF 2002 for the honor of addressing you today. I have the awesome responsibility of providing you with wise and inspiring words that will guide your entire future life, but I am comforted by knowing that I can't remember a single word of the commencement address when I graduated from medical school, or even who gave the address! To give you some idea of how dangerous it can be to offer advice that you expect to survive the ages, I need only quote from the 1938 commencement address of Dr. Rufus Cole, a protégé of the great Sir William Osler (1):

During your intern days the hospital should be your home, your workshop, and your playground, you should need nothing more. Learn to shun outside affairs that will complicate your life . . . rejoice if you are too poor to own an automobile . . . avoid the movies, you will find sufficient tragedy as well as comedy close at hand. . . . above all, avoid like the plague entangling affairs of the heart. . . . I am still convinced of the soundness of Dr. Osler's advice to 'put your affections in cold storage during your intern years.'

We are here today to pause briefly from our usual daily work to celebrate achievement; to reflect on the past; and to prepare for the future. So let us savor this precious moment.

First and foremost we are here to celebrate your individual achievements as some of you receive your master's degrees in genetic counseling and community medicine, others your doctoral

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degrees in biomedical sciences, and still others your doctor of medicine degrees. Each of you has demonstrated nearly superhuman self-discipline and made many sacrifices to prepare yourself for this very moment, which marks the beginning of your professional career in the healing arts. And your reward is the life-long blessing of being able to apply your unique intellectual gifts and humane insights to prevent and alleviate suffering from illness. At a time when the forces of hate and destruction are directly threatening the single core value that defines our civilization, namely the preciousness of each human life, you have chosen to devote yourselves to preserving that value with all your heart, your brain, and your soul. You should feel very good indeed, about your choice, yourself, and your calling.

This is also a time to give thanks to all your loved ones, those who could be here today and those who could not. They also made sacrifices to help you achieve this goal in your lives. Those who are closest to you and share your daily life know how difficult some days can be for you. Their encouragement, understanding, good humor, and belief in the importance of what you are doing, serve as a vital refuge against a tough and increasingly unforgiving world. For many of your parents and grandparents this day symbolizes the fulfillment of their hopes and dreams for you — and vows they made to you when you were still in their arms.

This is also a time for you to reflect on the great legacies of The Mount Sinai Hospital and the Mount Sinai School of Medicine, and to thank the extraordinary faculty of physicians and scientists who have taught you about the wonders of the human body and the majesty of the human spirit. Their devotion to teaching reflects one of the highest values of our calling, the seamless transfer of medical knowledge and medical professionalism to the next generation of physicians and scientists. As the fire from a single candle can light many others, so have they inspired you to relish the thrill of discovery and to appreciate the awesome human re-

sponsibilities that come with being a member of the health professions. I would suggest that the very best way to thank them is by making your own broad commitment to be a teacher, role model, and mentor for those who follow you, starting with elementary and high school students who are considering careers in health-related disciplines, especially those from disadvantaged backgrounds. This will not only ensure a continuous flow of outstanding young people into medicine, but also provide you with an unmatched sense of fulfillment and purpose.

One hundred and fifty years ago a visionary group of men and women, motivated by the moral imperatives of the Jewish religion to help those in need, gave generously of their time and resources to establish the first hospital in New York that would care for Jews who lacked the means to pay for their care. When that need was met, they expanded their commitment to include all those who were ill, regardless of race, religion, or ability to pay. That commitment, not bricks and mortar, is the true cornerstone of The Mount Sinai Hospital, and it has lived on as the institution's guiding philosophy through many generations. As you undoubtedly sense, however, despite the loyalty, devotion, and generosity of our trustees and many other supporters, the current financial realities facing all teaching hospitals that cherish community service, threaten to make it impossible to sustain that commitment. So I encourage you to be inspired by Mount Sinai's legacy and its leaders, and advocate for those most in need. Do not rest until high quality health care is considered a right of every person in this country and around the world.

What makes medicine both uniquely challenging and rewarding is that it stands atop the twin pillars of science and humanism, requiring the integration of these disciplines in the service of humankind. The expert physician has a comprehensive and deep scientific understanding of the causes of illness and the rational basis of disease prevention and therapy; the compassionate physician applies that knowledge with sensitivity to the unique needs and circumstances of a single complex individual. As a scientist, one resists accepting a new theory until the data are absolutely compelling, whereas as a physician one must act on incomplete evidence because the patient needs treatment now; as a scientist one looks for those elements that are common to a series of observations, and thus generalizable, whereas as a physician one seeks out that which is special or different about one's patients; and as a scientist one will go to extraordinary lengths to eliminate all variables except the one under study, whereas as a

physician, one can rest assured that the patient who sits before you is never exactly as depicted in the textbook. It is worthwhile to reflect, therefore, on the benefits that both science and humanism, each with its own perspective and values, can bring to individual patients and the public good.

The power of science is truly awesome. It is responsible for increasing the lifespan of humans during the past 150 years since the founding of this institution as much as had been achieved in the previous 3000 years. And the pace of new scientific discovery continues to escalate as the tools of science improve and as the resources society commits to science increase. The National Institutes of Health, which are funded by the federal government, have doubled their support of medical research during the past five years, and similar increases in support have come from the pharmaceutical and biotechnology industries. One graphic statistic is the estimate that as many as one-half the scientists that ever lived are currently alive, and I wouldn't be surprised if this was an underestimate in biomedical research.

The advances in medical science since I graduated from medical school 32 years ago are truly breathtaking and awe-inspiring. At that time, not a single gene had been cloned or sequenced, and the ongoing international race was to break the triplet code that converts genetic letters into genetic words. Now virtually all of our more than 30,000 genes have been sequenced. Equally staggering, in 1970 we did not have even one of the crucial tools we now take for granted to translate new genetic and biochemical information into new therapeutic advances — monoclonal antibodies, recombinant proteins, synthetic peptides, combinatorial chemistry, proteomics, and high throughput robotic screening. Stem cells were the province of a handful of theoretical biologists, not on the front page of every newspaper. Coronary artery angioplasty, which is now performed on approximately 3,000 patients every day in the United States, was still almost a decade away from being invented, and the idea of a coronary artery stent would have likely provoked dismissive and derisive laughter. Renal dialysis and kidney transplantation were just beginning and seemed miraculous, but we had nothing to offer those who needed a new bone marrow, a new liver, or a new heart.

Harnessing the power of the scientific method to alleviate suffering from disease is one of humankind's proudest achievements. And while all discoveries are intellectually thrilling as they reveal yet more information about us and our world, those discoveries that have the potential to heal have an added, even spiritual, dimension. Some

of you will have the unique satisfaction that comes from devoting all of your energies to help build the pillar of medical science taller and stronger, but I encourage each of you to think of yourselves as scientists as you apply the scientific method to your chosen discipline, whether it be medical education, biomedical ethics, or primary patient care. The first clinicians to report patients suffering from AIDS, West Nile virus, and anthrax were great scientists.

But what of that other pillar — the pillar of humanism? Given the complexity and diversity of the human experience, given the differences in human culture, history, religion, values, priorities, and assumptions about life, how can we ever hope to keep building it taller and stronger so that it continues to match the progress of the pillar of medical science? For to allow medical science to outstrip medical humanism poses as great a threat to us as to stop medical science itself. This is the monumental task before you, the graduates, and before all of us assembled today. Since I have no grand scheme or simple answers, allow me rather to share some humble thoughts.

The core of medical humanism is equal respect for all human life. Compassionate physicians never lose their sense of awe for the miracle of life and they recognize the common humanity they share with each of their patients. To paraphrase the physician's prayer ascribed to the great Jewish physician, Maimonides, which you will read shortly, the physician should not consider the patient "a vessel of disease" but rather a fellow human who is suffering. It is natural that physicians, especially when training, increasingly view the physician-patient relationship from the physician's perspective. However, when you view the relationship from your patients' perspective and the perspectives of their loved ones, you will realize that your patients' fears and hopes are profoundly affected by everything you say and how you say it. The words you speak during your daily hospital room visit will be analyzed over and over again by your patients and their families, so you must choose those words with care and you must deliver them with sensitivity. Eight years ago, Elie Wiesel (2) told the graduating class of this great school that "no one is as defenseless, as disarmed, as a person in pain and devoured by anguish. He or she will study every line in your face, every word on your lips. At that moment, you personify either hope or despair." He went on to say that "no one is as grateful as the patient who discovers a ray of hope in the eyes of his or her physician." So I encourage you to think hard about what your eyes are conveying to your patients. Art, literature, po-

etry, theater, and cinema can be great aids to help you keep the patient's perspective before your eyes, but nothing is as good as really listening to your own patients, sympathetically hearing their life story, and learning what they have to teach you. And nothing is as rewarding.

Finally, I believe that it is an understanding and appreciation of the importance of human diversity that lies at the center of humanism. In fact, because of the vagaries of the history of our species and the treacherous population bottlenecks that only the heartiest, or perhaps the sexiest, of our ancestors were able to squeeze through, we have dangerously little genetic diversity. Current estimates from the genome project are that humans of all races vary from each other by only about one ten-thousandth in their genetic makeup. Our genetic uniformity actually presents a serious risk, since we have learned from population genetics that our ability to survive the assaults that threaten our species on a daily basis, whether HIV or other scourges, depends on our having sufficient molecular diversity so that at least some of us survive. The case of HIV is most informative, since recent evidence demonstrates that having a rare mutation in a chemokine receptor needed for the entry of some HIV viruses into cells can protect a person from getting infected. Today's scorned "mutation" can thus be the key to saving our species tomorrow. Now, that is a reason enough to celebrate diversity. But there are many more reasons, since by respectfully learning from people who see and do things differently, we enrich each other, broaden each other's vistas, and give meaning and texture to each other's lives. In fact, the very best way to learn about ourselves is by seeing the choices that others have made. We are assembled here today in New York City, which has become the undeclared capital of the world precisely because it is the most diverse city in the world. Never forget that the sparks of creativity are always the brightest and most intense when powerful cultures and ideas meet head on.

And so, as you begin your careers today, I encourage you to go forward with confidence and self-assurance, knowing that you have received a superb education from many of the greatest physicians and scientists of our age, and from a concerned and caring institution that serves the most diverse population of patients in the world in the greatest city in the world. You are truly well prepared for your task. You will succeed.

References

1. Cole R. The practice of medicine. *Science* 1938; 88:309–316.
2. Wiesel E. To the class of 1994. *Mt Sinai J Med* 1994; 61:281–282.