

## *Commentary*

# **New Medicine for the New Millennium**

JAMES F. HOLLAND, M.D.

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Address correspondence to James F. Holland, M.D., Division of Neoplastic Diseases, Department of Medicine, Box 1129, Mount Sinai School of Medicine, One East 100th Street, New York, NY 10029 or address e-mail to: [msjournal@msvax.mssm.edu](mailto:msjournal@msvax.mssm.edu)

Fellow Students:

Now that you have limbered up by successfully completing medical school, you are ready for the main event — being a doctor for life. And what a life it will be! You will enjoy a special role in society — in every culture of the world — because you have a special calling. Yours is the task to fend off death, to reduce pain and suffering, and to improve the quality of life. It is not likely that these activities will change by January 1, 2000, as we enter the third millennium, when most of you will still be enjoying on-the-job training.

But what then? Most of us in this waning century have perceived medicine as a doctor-patient relationship, one on one. There is a change in the electronic wind, I believe, that will alter your role. When a click of your mouse can link Brooklyn to Beijing, Buenos Aires or Berlin, you know that the Internet will change your life. The world was not preshrunk. The process of shrinking the globe has begun in earnest in the World Wide Web. Real time communication does not bring virtual reality, it brings the genuine article, real reality to your very desktop. Your medicine, will be a doctor-world relationship, one on one.

We are the world's richest and most powerful nation. We should export four of our best products: health, education, government with the consent of the governed, and a stable economy with its better standard of living. I believe we must do so, and as doctors, I believe you must be in the forefront, if not the leadership, of this enterprise. These are not widgets for export. They are the substance from which global glue is made, cementing the human race together so that life is meaningful everywhere on the planet. If life becomes meaningless in desolate areas of the earth, the third millennium will be a thousand years of turmoil.

Take health. A vast and expanding underclass in the world still lives in squalor. They drink from rivers and ponds, from rivulets and puddles, they eat poorly and not enough, and they lose nearly half their young children from diarrhea, malnutrition, malaria and preventable causes of death. Starving the brain in infancy and early childhood, like starving the body, leads to stunted growth.

Fundamental health starts with sanitation and nutrition. Agricultural scientists who improve on the yield and protein content of the indigenous crops of Asia and Africa labor mightily for half the world's population. They are our allies. Inventors and engineers who create and simplify water purification systems are colleagues in the quest for health. Relatively speaking, vaccines are cheaper than disease. One of the world's great triumphs is the total elimination of smallpox by worldwide vaccination. Measles, hepatitis B and other preventable diseases claim untold thousands of lives each year, needlessly, for lack of an aroused world and a functioning infrastructure to conduct immunization.

Can we export education? In villages where light comes from the sun and the fireside, where electricity is still a far-off dream, the hand-cranked radio has been a magical instrument of learning. First, learning that there is an outside world. Illiteracy is a correctable blot on humanity, and its persistence at all in the United States is a blemish on America's luster. How is a man in a developing country going to develop himself or his country if he can't read? How is a woman going to manage her reproductive life, her family, her personal development and her attainment of equality if she is denied access to the accumulated wisdom in books? Television, that great hope of education, has in large part dawdled along the path, to stuff us in America like a Strasbourg goose, with sitcoms, soap operas and advertising fluff. To be sure, there is an occasional station that provides cultural and educational fare suitable for intellectual stimulation. The sad part is not how bad it is, but how good it could have been. But wait—the computer and the Internet to the rescue. They will soon own the educational horizon.

In the third millennium, forget the laptop. On your wristband computer, you may get to see a total viscerectomy, bloodless, of course, followed by implantation — since transplantation will be a thing of the past. Techniques of growing one's own cells into new organs will be commonplace if gene therapies have not already normalized organs in situ. Universal parts will be available for those who can't afford (or whose HMOs won't pay for) custom organ design. But to make certain that the world does not get overpopulated by individuals with ancient chassis and souped-up replacement parts, the Internet will periodically offer “Do It Yourself Visceral Exchange Kits,” payable in advance, naturally.

Neither health nor education can flourish in anarchy. Government is necessary, and to be ultimately successful the consent of the governed is needed. In bloody wars, health and education are early sacrificial victims. War implies chaos, starvation, disease and death often far worse for civilian populations than among the military itself. Is it too much to ask doctors to study war? War impacts on human health in a big way. Tens of millions have died in wars over the ages, yet this special human failing gets scant medical attention.

Is the world so politically stable that we can be assured that weapons of mass destruction will never be used? The awesome power of nuclear weaponry seems to have been downgraded in foggy memory. A single high level blast could ignite the forests of Montana, Idaho, Washington and Oregon into a pyromaniac's dream candle to light the world. A single ground level hit on Manhattan

would make Buffalo the largest city in the Empire State — for a few minutes. Can't doctors fathom the intricacies of the human mind in order to prevent such grievous behavior? The study of the brain and its functions, and dysfunctions, is a high calling. Our thought processes are our most distinctive feature as a species. Many politicians in the past have had an intellectual and emotional disconnect from the realities of all-out war. It could be true again in the future.

You young doctors can do better. There won't be a pill that averts war. But there can be a universal chorus of doctors from every nation who know life and death more intimately than others, chanting like the chorus in ancient Greek tragedies about the catastrophes to come. And you can sing of the nobility of life well invested, with health, education and a future. War and its consequences are too important a problem today and for the third millennium to be off your screens. Every day every doctor should ponder the human condition and how to avoid the tentacles of war.

Stable consensual government also is indispensable for justice and for broad economic security. A meaningful job is part of the fulfillment of life. With work comes satisfaction and the resources to supply oneself, one's family and one's society with a quality existence. Doctors rarely have to worry about this for themselves. It does not require a Rolls Royce to get to the office. But there are many people in this world who lack employment, and thus often lack good nutrition and good health, good or any education, and certainly lack a good quality of life. Such understandably unsatisfied people are the raw material of discontent, of crime, and of revolution, becoming a rabble in arms. As we survey our appropriate obligations to fellow Americans, we disregard at our own peril, equally appropriate obligations to globe mates who are but a mouse click or an airport away. They are so close we will probably import many of their epidemic diseases, and not a few of their problems.

The industrial revolution and motor vehicular traffic have so depended on fossil fuels that CO<sub>2</sub> production has led to a greenhouse effect, and evidence of global warming. Would nuclear power with all its problems be better? Shouldn't we all lobby for more research on the fusion reactor, which could provide unlimited energy from the hydrogen in water? And what of industrial and agricultural pollution that fouls the air and poisons the aquifer? Shouldn't we admit a finite limit for the human population, before derivative industrial pollution, primitive territoriality epidemics or famine evoke their own kind of population control?

Well, those are near-term questions with which your generation must grapple. Your productive careers will span the next 50–70 years. Many of you will still be sprightly in your 90s, and if the current politics of medical economics prevail, many will still be working. The first half of the 21st century will certainly be an interesting time. In our prophecies we usually underestimate badly. In 1900, not many prophets foresaw men on the moon, women in space, instant communication, hundreds of millions of mathematical calculations per second, antibiotics, heart transplants, the rise of cancer, and the disappearance of tuberculosis sanatoria and insane asylums.

Medicine stands now on the threshold of a phenomenal advance. The complete delineation of the human genome by 2005 will allow physicians to define the interaction of the environment

with the unique nature of each individual's operating system. You will not only be able to predict disease, but may be able to intervene to prevent it. Yea, the glory days of medicine are still ahead.

Since we all cohabit this same tiny speck of the universe, let us be sure we all participate in the work and all partake of the rewards. To bring this about will require that doctors lead in concepts of health, not just disease, entailing commitments to education, governance and economics.

I addressed you at the outset as Fellow Students. It is my fervent hope that when you reach your 50th anniversary of graduation from medical school, which I celebrated two days ago, you can be as confident of the future of medicine in the third millennium as I am that each of you can be a powerful and magnificent force for the betterment of your patients, and of the world.