

Challenges in prevention

Dinner lecture

Continuing Education Program [Ed Roulhac]

JHU School of Hygiene and Public Health
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Erich Fromm

"The history of man is a graveyard of great cultures that came to catastrophic ends because of their incapability for planned, rational voluntary reaction to change."

- The very essence of prevention ^{implies} change - it implies foresight - it implies wisdom - to foresee a future and to take action in a timely manner to avert catastrophe.

The past 50 years have witnessed unprecedented changes in medicine, in science in its totality - indeed, in our entire social structure and values. We can be confident that the next 50 years will bring even more revolutionary changes but can we anticipate them any better than we anticipated the computer, organ transplantation or ^{nuclear power} the atom bomb? At a far more mundane level could the surgeon-general in the midst of a 1930 Washington heat wave have anticipated that the now ubiquitous

venomous poisonous bombs.

- Acknowledge an indebtedness to a colleague Dr. Howard Hirsch for the phrase.

air-conditioner would be in common use only 20 years hence? The surgeon general, then as now, was prepared to offer advice: "Imbibe long, cool drinks; keep your windows closed (sic); keep the spinal cord protected (wear hats outdoors); be discrete physically, mentally and emotionally." Government offices were closed during that heat wave except for the Printing Office, the Treasury Department and the Prohibition Bureau.³ What a different era, what a different agenda of problems and solutions, and yet it was a year when many of us here were alive.

The rapidity of change and the documentation of catastrophes, instantly communicated around the world, have been significant factors in eroding a public confidence that either individuals or institutions have the capacity or ability to intelligently guide their futures. The fact that catastrophe is more worthy of attention than good news abets this. A vivid illustration of this was the year 1974, in India. Because of an improved eradication campaign and better reporting, the numbers of smallpox cases ~~being~~ recorded daily were higher than any in 15 years. The apparent disaster was endlessly recounted in headlines across the country week after week. However, in August 1975, not a year later, India celebrated its Independence Day and, in a memorable ceremony, declared its freedom from smallpox. The event was reported in a terse article on the fifth page of New Delhi's principal paper. The coverage was especially disappointing because beginning in the autumn of 1973, a perennially maligned Indian health service had made a vigorous commitment to the apparently impossible task of smallpox eradication ~~and~~ ^{it} in less than two years, had succeeded. One component of its strategy called for more than 120,000 health workers to visit each house in India during a one-week period each month to search for cases - and this they did. Independent assignment showed that more than 90% were indeed being visited each month. The magnitude of the effort is better understood when one appreciates that the number of households in India is three times that of the United States. Eight tons of forms were required for each search. The capacity of the Indian health service, as an institution, to effect rapid change was and is vastly greater than any had imagined, ~~and~~ ^{such} may be said of health structures in other countries in which we worked. What had been lacking was a plan and direction.

What occurred during the course of the smallpox eradication program served to reinforce a personal optimism that we have the capacity to meet the challenges of the coming decades. Our problems are three - to decide which are the essential issues, to make necessary political and moral commitments and to identify and support the necessary leadership.

Today, it seems to me, there are two totally overriding issues in the field of prevention - neither are ~~listed~~^{topping} on your program - ~~the nuclear~~^{problem of the} and for both, the time is ^{very} late indeed. One is ~~the~~^{is} the problem of the ~~nuclear~~^{atomic} bomb and the second, the population bomb. ~~Both need to be~~^{Neither can be} solved solely by health professionals but ~~we~~^{we} do need to assume a far more active ~~role~~^{role} in education and ~~advocacy~~^{advocacy}. During the past year, many of you, I am sure, have read of ~~medical~~^{medical} group called the Physicians for Social Responsibility who have set, as their mission, the education of colleagues and the public alike as to the realities of nuclear warfare. It is important that we talk of it tonight ~~and public figures actually talk of "winning" a nuclear war~~^{and public figures actually talk of "winning" a nuclear war} since the term "limited nuclear warfare" is increasingly heard. The ~~question~~^{medical} implications are little understood. They need to be approached, ~~is "limited" compared to what?~~^{and preventive strategies} must be found.

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There are ~~some people~~ ^{those who} still talking in terms of winning a nuclear war, ~~our conclusion is clearly not yet universally accepted~~. There are ~~therefore two questions to ask~~. ^{one must ask whether} First, ^{is} ~~is our~~ grim perceptions of the medical picture ^{are} accurate ^{and} ~~second~~, if so, what are ^{the} ~~its~~ implications? ~~With respect to the medical aspects, I can say that~~ ^{it} ~~There has been~~ no serious challenge to the position that, in the event of nuclear attack, the casualties would be overwhelming, and the medical profession virtually helpless. ^{But, how helpless?} ~~On the contrary, responses from physicians throughout the country and the world have provided strong support for that assessment.~~

~~Recently I gave a talk on this subject to a group of doctors. One of them, a consultant to the Strategic Air Command, said that a week earlier he had been at a SAC base, where he was asked for estimates of how much blood plasma to stockpile in preparation for the possibility of a nuclear attack. "After listening to your projections of the injuries that would result from one nuclear weapon," he said, "I think that my estimates were ridiculously low. It seems to me that the needs of the wounded in a single city would far outstrip the total amount of plasma in storage throughout the country, and possibly the world."~~

The Office of Technology Assessment of the U.S. Congress, with the assistance of the Defense Department and the Central Intelligence Agency, issued in 1979 a detailed study of the effects of a nuclear attack on a large city. The targeted American city taken as an example was Detroit (the Soviet city described was Leningrad). The study ^{examines the effect of} ~~projects that~~ one

nuclear weapon with a force equivalent to one million tons of TNT ⁷⁰ times more powerful than the bomb dropped on Hiroshima, but not nearly so large as some existing strategic weapons) dropped on central Detroit ^{It is projected that it would result in 70 square miles of property destruction, 250,000 deaths, and 500,000 injuries.}

^{A number of} ~~Presumably~~ scenarios which ^{envisage} ~~envision~~ our victory in a nuclear war count on medical aid to save many of the wounded. But the O.T.A. study points out that most of the medical resources of Detroit, located as in other metropolitan areas close to the city center, would be destroyed. From other projections, we can assume that as many as 150,000 of the 500,000 wounded would be burn victims. To put this number in perspective, ^{is believed} ~~we should remember~~ that under optimal conditions -- that is, when all medical resources are operating at full efficiency -- Detroit's specialized facilities ^{could} ~~can~~ accommodate at most 30 severely burned patients. For the whole of Michigan the number is 107; for the nation, fewer than 2000.

And even these numbers are misleading, as is evident from the case history of a burn patient in Boston which ^{Dr. Hault} ~~is~~ described in an editorial ^{last fall} ~~on this subject that I wrote, at their request, for the Journal of the American Medical Association last fall, entitled "Preventing the Last Epidemic."~~ ^{The victim} ~~He~~ was a 20-year-old man who had been severely burned in an automobile accident. His injuries were similar to those suffered by many residents of Hiroshima in 1945. Over a period of 33 days, he required 281 units of plasma and almost as many units of red blood cells

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and other blood products. In other words, more than five hundred transfusions. He had six operations to cover the 85% of his body surface that had been burned with grafts, ~~and artificial skin.~~ He needed continual mechanical ventilation, and other ~~extraordinarily~~ sophisticated medical, nursing and laboratory procedures. ~~that occupied much of the time of many highly skilled people.~~ The care of this one badly burned patient stretched the resources of one of the country's most comprehensive medical institutions. Nevertheless, he ^{was} ~~could not be~~ saved.

If our perception of medical impotence is accurate, then what are the security implications? Physicians have no expertise on policies that would assure nuclear peace. If, however, ^{estimates are} ~~our~~ national security ^{health} ~~is~~ based to any extent on the expectation that the ~~medical~~ community can respond meaningfully to a nuclear attack, then it is up to ^{that} ~~the medical~~ community to present the facts, however unpleasant they may be. A more general awareness of these facts might encourage a public dialogue on a question that is obviously of critical importance to all Americans. The question is: what policies ^{must} ~~need~~ we adopt to prevent nuclear war?

Military strategists agree that at least for the present we must maintain a nuclear capability sufficient to deter the Soviets from first use of their nuclear weapons. Clearly, no sound medical argument can be raised against this reasoning; the medical consequences of a nuclear attack on us that might follow unilateral nuclear disarmament would not differ from one brought on in any other way. The medical perspective, however, is critical to the consideration of what is being called "limited" nuclear war. ~~This term is heard increasingly as a growing number of planners suggest that something short of a total nuclear battle is thinkable and even winnable.~~ If one considers the medical implications, in all their horror, of any nuclear explosion, then limited nuclear war assumes its true proportions. What may be limited from a strategic point of view is unlimited catastrophe from a medical point of view. ~~The term "limited nuclear war," therefore, is misleading and should~~

There are ^{standards} ~~two~~ simple answers but none would ~~short~~ the need to begin

taking seriously and discussing the subject actively

The second problem, ^{perhaps even more} ~~to~~ ~~less~~ serious because it is insidious in

its development ^{there} and even less likely to command the urgent attention

required - that is, the population bomb.

The issues of the coming decades encompass a spectrum of problems - from agriculture to energy; ^{from} ~~to~~ political and human relations, to the fundamental question of whether this planet can support man himself. Problems germane to medicine and the biomedical sciences do not exist in isolation. However, at the heart of the problem is the recognition that resources are finite. Were it possible to alter the denominator in the equations - the population of man - the range of available options would greatly expand. Wanted, healthy children born to healthy mothers is at the core of the problem.

Interestingly, it is the year 2030 - ~~exactly~~ 50 years hence - when the world's population is predicted to reach the 10 billion mark - a figure $2\frac{1}{2}$ times greater than the population today.⁴ A 1969 National Academy of Sciences report concluded that a world population of 10 billion "is close to (if not above) the maximum that an intensely managed world might hope to support with some degree of comfort and individual choice."⁵ Forecasting is anything but an exact science and the scenarios of the futurists have to be accepted with qualifications. Nevertheless, it is all too clear that we in North America occupy a privileged position in an increasingly densely populated, interdependent world. Regrettably, even today, many regard the developing countries more as charitable wards than peoples who are integral to the fabric of our own existence. And yet, even now, they provide one-fourth of our raw materials and account for one-third of our export market.⁶ It is in these countries that the population is growing most rapidly.

If ~~as your Agenda says~~ ^{our} our children are our greatest natural resource, and our neglect could jeopardize them, ourselves and our future, ^{and} ~~you~~ must ask which are "our children"? Even if we consider

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only this country, we find that tens of thousands were born in Mexico, in Vietnam, in Haiti, in Cambodia. ~~Children from Afghanistan are now beginning to arrive. In the same manner that~~ So many of our own ancestors, driven from their homes by natural or man-made catastrophe, sought refuge ^{in the same manner} in the United States, in Canada and other countries of the New World. Increasing numbers now living in developing countries are seeking to do the same. The trickle of migration which we now record, predictably will grow to become a stream, perhaps even a flood tide. What should be our response? Will we and each of the other more affluent, industrialized areas build a wall like that which divides eastern and western Europe? Would it work if we did so? Would it be possible to say to others less fortunate, "send us your raw materials, buy our manufactured products and agricultural produce but your people are forbidden to enter this privileged walled enclosure"? The solution is not only unrealistic but politically impossible and morally questionable. To date, we have careened from crisis to crisis with short-term commitments to meet short-term problems. Governmental policy reflects this - a dollop of development assistance, the addition of a few people to the facade of a border patrol, and costly resettlement and welfare programs for the waves of refugees which enter the country in response to repeated crises. ^{Even if we are unimpressed that developing countries, it would not be for the} The refugee children become this country's children and our responsibility with the scars of malnutrition, limited education, barriers of language and the trauma of resettlement. ~~The challenge is not unlike that which you faced in the 1930s but on a different scale and on a different plane. From the date of its founding, the Academy has been an advocate of prevention. In fact, to quote from Alan Brown, Professor of Pediatrics at the University of Toronto: "Pediatrics has been the pioneer specialty in preventive medicine. From the very beginning of ... pediatrics, prevention has been the all-important theme, and today the best work is done in preventive medicine."~~⁷ The year was 1930. The challenge of the coming decades is ~~no less that of~~ prevention but on a broader scale and encompassing a broader range of concerns over a broader geographic area.

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The problems ahead extend beyond the boundaries of medicine as they have been traditionally defined - but, sensibly, so do your national health goals which identify needs of adequate income, education, societal setting and environment.

In a jungle of diplomats, engineers, agronomists, merchants and others, can a comparatively small group of ~~pediatric~~ health professionals assume more than a subsidiary role? From my perspective, I believe ~~you~~ ^{they} ~~can~~ ^{could}, should and must take a primary role as ~~the~~ catalysts for the bold changes so urgently required.

In a world politicized and polarized, in a world where race and religion are a source of constant friction, medicine and health represent a unique, remarkably apolitical bridge. To me, working for 11 years in the World Health Organization, it was a never-ending source of amazement to observe how readily differences were set aside in the interests of a common goal in health. The two principal contributors to the smallpox program were the United States and the Soviet Union. Not less than twice each year, the Surgeon-General of the U.S. and the Vice-Minister of the Soviet Union met with an American program director to discuss progress, problems and needs. Throughout civil wars in Nigeria, Ethiopia, Pakistan and many other countries, the program continued. Vaccine was distributed to both sides; guerrilla forces not infrequently welcomed and assisted government surveillance and vaccination teams; surveillance teams crossed national borders to work with counterparts in controlling outbreaks in neighboring countries. The WHO smallpox staff was comprised of professionals from 73 countries and donations to the program were received from 44 countries.⁸ In no other field is it more feasible to build bridges of understanding. What could be less controversial than ~~the eradication of disease or better health for children?~~ ^{health?}

It is not enough, however, for medically trained professionals to offer technical guidance in such programs. They must assume roles as planners, managers, strategists - in brief, leaders. In the United States, we have increasingly turned to the professional manager - an

individual with no special expertise in any particular industry or technology who is expected to step into any position and run it successfully. In a recent article analyzing causes for the current malaise in American business, Hayes and Abernathy,⁹ faculty of the Harvard Business School, identify this trend as one of our principal problems in American industry today. They document the fact that American management, in contrast to Japanese and European management, is increasingly dominated by accountants and lawyers whose energies are directed to quick profits, cash management and corporate mergers. As they state: "The key to long-term success - even survival - in business is what it has always been: to invest, to innovate, to lead, to create value where none existed before. Such determination, such striving to excel, requires leaders - not just controllers, market analysts and portfolio managers." In the health field, no less, we need professional expertise to provide leadership. The problems are too important to be left to ~~the professional managers,~~ the professional diplomats and the professional politicians. If we do, we will almost certainly have politically-conceived, questionably effective, pedantic programs offering short-term solutions. ~~In brief, we need those skills and that expertise which you in the Academy represent - to manage and to lead.~~

Futurist scenarios are driven by ~~expanding, if not~~ exploding sizes of populations whose rates of growth, however estimated, foreshadow catastrophe only decades ahead. To slow population growth to the point where it can begin to balance resource development is proclaimed not just to be difficult - it is stated to be impossible. Social behavior and social change, it is said, are inevitably slow. Ironically, Rene' Dubos published his book, Man Adapting¹⁰ in the same year that the Smallpox Eradication Program began and made this same point when he said: "Social considerations, in fact, make it probably useless to discuss the theoretical flaws and technical difficulties of eradication programs, because more earthy factors will certainly bring them to a gentle and silent death." We accept the principle uncritically that social change is inevitably slow. I wonder if this is not, in fact, a rationalization for uninspired leadership, and/or an excuse for inaction.

One of many vignettes which I witnessed during the Smallpox Eradication Program illustrates the reason for my skepticism. In Afghanistan, a rigidly orthodox Muslim society, ^{most} a woman, from puberty, ^{is} is consigned to purdah - a life behind the mud walls of a house, never to be seen by any man other than ^{her} ~~her~~ husbands. Most are not even permitted to go to market. To vaccinate members of a household would require that permission first be granted by the man of the house and then, one by one, each of the children and adults could be vaccinated. Even then, we were told, male vaccinators would be unable to vaccinate women. More than this, vaccination was said to be all but unknown in most parts of the country and would be resisted by force. Accepting as fact all we were told by the experts, we foresaw that Afghanistan would almost certainly be the last and perhaps the permanent bastion of the disease. We had no option but at least to try. A strategy was developed in which an advance team visited each village to discuss the program and the intent of vaccination with the village elders. Subsequently, male vaccinators conducted systematic house-by-house vaccination. Assessment teams followed to determine if the teams had reached 80% of the residents. The program required that, if they had not, the teams would be sent back without per diem to repeat vaccination. This provided incentive. We were amazed soon to find that assessment consistently showed coverage exceeding 90%. Three years were required to reach all parts of the country in the first round of vaccination. A second round was then begun because we knew that the many nomadic peoples would certainly have been missed and a new generation of newborns would be unprotected. This time, it took only 15 months and a third round took 9 months. Subsequently, DPT and BCG were offered but now, in many parts of the country, women from several houses were collecting with their children to facilitate the process. In 6 years, social and religious strictures extending back centuries had changed dramatically in a primitive country where orthodoxy is a way of life.

Changes in family planning programs can be no less impressive. Bali, with a population of 2,000,000, a traditional, rural Hindu culture, decreased its birthrate from 44 to less than 20 in just seven years.¹¹

Similar dramatic changes have occurred in places as distant and different as Thailand, Costa Rica, Chile and China. Over the past 15 years, the world birthrate has dropped from an estimated 34 live births per 1,000 population to less than 27 per thousand, a decrease of more than 20%. And yet, according to recently reported results of the World Fertility Survey, one woman in four reported that her most recent child was unwanted.¹² Effective programs to assure these mothers that children who are born will survive would undoubtedly increase this proportion. When you appreciate that in many countries 30 to 40 percent (not 30 to 40 per thousand) but 30 to 40 percent of children who are born do not live for five years, you may better understand the reason for frequent pregnancies. Even so, half of all the married women of childbearing age report that they want no more children but half of these women are not using effective methods to prevent contraception. Dramatic changes in population growth have already begun to occur but the potential for yet more dramatic change is apparent. The problems of effecting sociobehavioral change must not be disregarded but this, I believe, is not our real constraint. The need is for commitment, leadership and management.

The potential for therapy and prevention is growing, as never before, nurtured by a magnificent base of biomedical research. You know it well. Immunology, fiber optics, nuclear imaging, radioimmunoassay,

recombinant DNA technology and others are dramatically expanding our horizons. To the press, indeed to many of our colleagues, these developments appear to be the real challenges, the true frontiers of medicine. Indeed they are but there are other frontiers, other priorities, perhaps less dramatic, less newsworthy but far more urgent if we, as a species, are to achieve equilibrium with planet earth, ~~And the cutting edge to that problem is wanted children who are given the opportunity to grow in health to adulthood.~~ ^{and at the same time to avoid destroying ourselves in the process.} but the horizons for doing this do not stop at the borders of the United States or Canada or Mexico. The responsibility for achieving this cannot, must not be relegated to those without technological competence any more than American business can longer afford to relegate its leadership to accountants and lawyers.

As health professionals we have a vital role to play but the hour is late.

~~The leadership and the articulate voice with which you in the Academy have so long been identified are vital if we are to rewrite the grim scenarios depicted in such as The Global 2000 Report. But the hour is late and the need for leadership is real.~~