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A Venture and a New Beginning

This issue marks the first appearance of *The PSR Quarterly: A Journal of Medicine and Global Survival*. As a journal of Physicians for Social Responsibility, but not for it only, our intent is to reach a broad audience. Our themes are the challenges of the decade and the next century, seen in the light of time past and time future. Our mission is to promote informed discussion, analysis, and action.

This new effort has deep roots. 1991 marks the 30th anniversary of Physicians for Social Responsibility (PSR). Conceived in one of the iciest phases of the Cold War, in the year that saw the Soviets succeed in constructing the Berlin Wall and the U.S. attempt to invade Cuba, PSR was launched when a small group of physicians based in Boston decided to begin a campaign against the nuclear arms race. Their chances of starting something that might last a year, let alone 30, seemed long indeed.

Yet in 1991 the Berlin Wall has collapsed, partly of its own weight, partly pulled down by quiet heroes who resisted its presence in the thousands of small ways that people refuse to accept current reality in the service of a dream. The dismemberment of the Soviet bloc leaves Cuba listing in the doldrums of a tired ideology. The nations of Europe are defining a common future that has no precedent; a future that may be sufficiently vibrant and inclusive to support those societies now immersed in a bleak transition from communism to something else. In 1991, PSR can look back on a series of debates and victories, a trajectory of membership growth and sustained public influence, and a record of advocacy and testimony that defines what it is to bear witness in the political arena of our age. In 1963, in response to world-wide outcry against atmospheric nuclear testing and resulting global fall out, the U.S. and the U.S.S.R. signed the Limited Test Ban Treaty, outlawing all surface nuclear weapons tests. PSR contributed to that public campaign. During the 1960s and 1970s, in the midst of uneasy public acquiescence to the bizarre doctrine of mutual assured destruction (MAD), PSR continued to point out the risks embedded in the nuclear arms race and the accumulation of massive nuclear arsenals. In the late 1970s and early 1980s, MAD was replaced with the notion that stability could derive from superiority in arms, which was refined to mean greater flexibility in response or attack. This shift in military strategy, the outbreak of war in Afghanistan, and the rapid acceleration in spending on weapons research and development all contributed to a new level of public concern about nuclear war. The late 1980s brought some breakthroughs in public under standing

and a developing national and international consensus about the meaning and nature of nuclear war, the futility of medical response, the effects of nuclear winter, the illusion of civil defense, and the Third World consequences of a major nuclear exchange in the Northern Hemisphere.

There are three key elements to this consensus. Nuclear war, once begun, whether by accident or intent, would not remain "limited." The imponderables of command and control and the inextricably linked escalation strategies would entrain many countries after the first use of nuclear weapons. Second, nuclear war cannot be described solely in terms of short-term effects deriving from the physics of the weapons themselves. Because it would destroy our biological networks and social relationships, nuclear war would inflict thorough and extensive devastation on all aspects of world existence for a very long time. Third, nuclear war cannot be understood in conventional terms. It is neither a disaster we have seen, nor a war we have fought. Unlike previous disasters, nuclear war, in its instantaneousness and totality, wipes out the potential for outside response and social recovery. Past wars have been fought with the rational objective of winning. The notion of winning included, as a minimum, the notion of surviving. After nuclear war, neither notion has much reality.

Nourished and impelled by these advances in public consciousness, the concrete victories have been substantial. The massive civil defense plan advanced in the early years of the Reagan administration, Crisis Relocation Planning, has been abandoned, as logistically infeasible and strategically provocative. The Strategic Defense Initiative is winding down, exposed finally as the outrageously expensive fantasy of an aging President and a few technological enthusiasts. The brief and costly imposition of cruise and Pershing missiles in Europe is now acknowledged to have been one more feint in the Cold War, recently rolled back in the landmark treaty on intermediate nuclear forces. The MX missile and the B2 bomber are in trouble; seen by a growing number of Congressmen to be billion-dollar programs of increasingly dubious promise. The U.S. and U.S.S.R. have signed a sweeping treaty on conventional forces, in the midst of events on the ground that have driven troop levels below those specified in the treaty. A superpower accord on strategic nuclear forces hovers near completion.

To sum it up, after 30 years of effort by PSR and many other organizations, we can show three significant treaties completed and signed, two major programs shelved, several weapons systems slowed or rejected, and a sea change in public attitude. As the U.S. affiliate, PSR even shares in the Nobel Peace Prize conferred in 1985 on the International Physicians for the Prevention of Nuclear War.

Yet when we look back, in the light of what we know now, it appears that the U.S. has wasted an enormous amount of energy, material resources, and human life in getting from there to here. We have built incredibly elaborate arsenals, only to face the substantial task of getting rid of them. We have leveled and contaminated millions of acres of land for use by the nuclear weapons production and testing

complex and now must find the hundreds of billions of dollars to contain and confine the environmental dangers we created. To keep the world safe for democracy we have destroyed societies in order to save them and squandered our land and talent in a conventional and nuclear arms race so profligate it looked as if there were no tomorrow, as there might well not have been.

There is no comfort in realizing that the U.S. is not alone in this history, that this recital of expenditure, waste, and loss pertains to the Soviet Union and its bloc nations and to many of our mutual client states around the world, entwined with us in the cycles of the international race to develop, produce, test, buy, sell, and amass weapons of ever increasing destructiveness. There is no comfort because this race has not stopped, only reached an interim plateau.

There is no comfort because as a world community we must all now recognize that tired and spent by the recent past we face enormous problems in the present and near future. The Gulf war must be seen for what it is -- past actions coming home with a vengeance. The West and East armed the Mid East as the second front in the Cold War. Now we are caught up in the potentially catastrophic uses of these weapons to settle a mix of local, transplanted, and imposed scores. Nuclear weapons are but one technology now accessible; there are many on the horizon, such as chemical and biological, to which a rapacious, trapped, or brutal nation could turn.

We are distracted, with reason, by problems in the near foreground: global climate change, pollution and destruction of our natural environment, still uncontrolled population growth in some of the most densely populated areas on earth, and a growing and negative disparity between the numbers of those with food and those who are always hungry. The light is going out all over Africa, which is falling ever farther behind in the competition for international markets and is about to enter the modern equivalent of the plague years that haunted and oppressed Europe for much of the fourteenth century.

So despite our hard-won gains, which are no less and no more than the successful steps our society has taken away from the brink of nuclear war, we head into the 1990s with a certain wariness. In the midst of the bad news, it is unclear how to weigh, let alone celebrate, the developments we still dare to call hopeful. We are facing the paradox implicit in Virchow's admonition to members of the Prussian Parliament in 1869, in a debate on reducing military expenditures. "Disarmament," he said, "is necessary for the progress of civilization" [1]. From our vantage point, facing the challenges that lie ahead into the 21st century, he might just as well have said that the progress of civilization is necessary for disarmament.

It was in growing recognition of this connection between what a society has learned to value and where it decides to devote its resources that PSR in the last several years has expanded its agenda to address a range of concerns in the context of a richer, wider definition of social good, human aspiration, and true national security

(incorporating issues of the economy, health care, education, the drug crisis, and AIDS).

It was this connection between disarmament and civilization that led PSR in 1990 to adopt a major focus on the environment. "A culture is no better than its woods' [2]. The arms race is only one manifestation of human violence and human creativity. As we invent new methods for killing each other, we play with annihilation; as we explore and conquer our earth, we trample on what might sustain us. It is past time to acknowledge our global interdependence, a reality we have long struggled to ignore, and to begin to define its constraints and untapped possibilities.

In 1961, when Bernard Lown, Sidney Alexander, Jack Geiger, Victor Sidel, and others together founded PSR, it was clearly a tall order to take on the nuclear arms race. In 1979, when Helen Caldicott joined the organization, we sounded the tocsin for the eighties. In 1991, PSR has as much as said that it seeks to advance the progress of civilization. Finally, our declared mission has fallen in step with our name.

It is certainly a mission that is shared by many outside our membership, by many outside our profession. It is certainly a mission that can be accomplished only by the direct participation and effort of countless individuals in many nations. Hence another recent decision of the PSR leadership.

In committing to The PSR Quarterly, PSR recognized that to fulfill our expanded mission we would need to reach out and enlist the resources of a wider constituency than we could find within our own very diverse and energetic membership. In the pages of this journal we intend to talk deeply with each other, and extensively and candidly with those from other disciplines. We intend to publish research, analysis, and informed scientific and medical opinion on the nature and consequences of weapons of mass destruction and the impact of catastrophic events, such as natural and technological disasters, war and civil conflict, famine and disease, that may inflict vast loss of life and threaten regional or global devastation. We will also address the implications of major environmental change on human and natural ecosystems. We will examine the role of physicians and scientists in the creation of knowledge and the development of technologies, including weapons systems, that have profoundly affected our moral landscape.

We seek to present historical, ethical, and ecological perspectives on these issues, exploring the capacities and vulnerabilities of biological entities enmeshed in stressed circumstances. We wish to promote discussion of the ways in which people currently or in the past have attempted to arrive at constructive responses to these problems of great social concern. In these ways we hope that The PSR Quarterly will present themes central to our common society and our world.

And so each venture
Is a new beginning, a raid on the inarticulate . . .
And what there is to conquer

By strength and submission, has already been discovered
Once or twice, or several times, by men whom one cannot hope
To emulate -- but there is no competition --
There is only the fight to recover what has been lost
And found and lost again and again: and now, under conditions
That seem unpropitious.
But perhaps neither gain nor loss.
For us, there is only the trying.
The rest is not our business [3].

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Vol. 1, No. 2—June 1991

Physicians and War: Limits and Responsibilities

The ethics of being a doctor are both wonderfully strong and quite narrow, and thus cannot be wholly relied upon for guidance in those many political situations where there are few, if any, good options.

The Hippocratic Oath and the Oath of Maimonides admonish the physician under all circumstances to hold primary the needs of the individual patient. In wartime, when the world is divided into friend and foe, an ethical dilemma revolves around the extent to which the physician-patient relationship can remain inviolate or must conform to the dictates and needs of the state, particularly the military. Several developments in the last 300 years have made this question more acute. The institution of the standing army (dating from the seventeenth century) has massively increased the numbers of people on the battlefield. The expanding technology of war, one of the engines of the industrial revolution, has supported the capacity of warring nations to produce an ever-increasing number and complexity of war casualties, both military and civilian. As the wars have become more bloody, society has demanded that physicians, nurses, and other health professionals become ever more involved in the care of the wounded in battle.

Participation in the Conduct of War

This demand has been framed in two major ways: 1) it is nested in a set of international treaties and agreements that contain specific provisions regarding the conduct of physicians in war, and 2) it is expressed in different national laws regarding the drafting of physicians in time of war.

Four international agreements relating to the protection and treatment of combatants and noncombatants in war constitute what are known as The Geneva Conventions. Each evolved from one or more treaties settling major international disputes dating from 1864 on, and together were codified in one formal document at the Geneva Conventions of 1949.

At the end of World War II, the Allied nations conducted two War Crimes Trials, in Nuremberg and in Tokyo, where officials charged with a range of war crimes were tried before international tribunals. No specific allegations were made against physicians at the Tokyo trials. At the Nuremberg Medical Trials, however, German physicians who had worked under the direction of the Third Reich were among

those charged and held responsible for a category of crimes called "war crimes" and another category called "crimes against humanity." These physicians had participated in the Nazi euthanasia programs (killing the feeble, the mentally disturbed, and the deformed), in lethal experiments on prisoners of war and concentration camp victims, and in the genocidal campaign against the Jews. Of the 18 physicians who were charged, all were found guilty and four were executed. The defense these physicians sought to establish was that which had been invoked by senior Nazi officials at the Nuremberg War Crimes Trials: their participation in these actions was required by their allegiance to the state and the military command. As officers in the Army or as employees of the state during time of war, it was their duty to obey the commands of their superiors [1].

This defense on the part of physicians was declared insufficient by the judges at the Medical Trials, as it had been for the Nazi officials tried before the International Tribunal. The summation of this decision relating to physicians affirmed the general provisions of Law No. 10 of the Control Council for Germany, which stated, in part: 4. (a) The official position of any person, whether as Head of State or as a responsible official in a Government Department, does not free him from responsibility for a crime or entitle him to mitigation of punishment. (b) The fact that any person acted pursuant to the order of his Government or of a superior does not free him from responsibility for a crime, but may be considered in mitigation [2].

As another considered response to the aftermath of World War II, the World Medical Association (WMA) was founded in 1947, with the declared intent of fostering discussion on key issues of medical ethics and forging an international consensus around recommended courses of action that could serve to inform physicians throughout the world. The WMA has issued three major sets of recommendations of particular relevance to the conduct of physicians in war or civil conflict (1).

Embedded in these various conventions, tribunal decisions, and protocols are key injunctions that have acquired the status of internationally accepted codes of physician behavior in war. The overriding general principle in all of these is that physician behavior in war should abide by the same ethical standards as behavior in peacetime, and should strive towards the same primary goal: to preserve health and to save life.

A deep contradiction runs through the application of this principle in both civilian mass-casualty medicine and in military medicine. In the setting of mass casualty events where need clearly outstrips resources, society has come to countenance the application of triage. Triage, or the process of assigning priority access to resources on the basis of patient need, has with time and use become the sanctioned approach to the efficient and proper practice of medicine, whether in a peacetime disaster or in a battle in time of war. In civilian mass-casualty medicine, triage conforms to the value paradigm that seeks to maximize the numbers of lives saved; in military triage, the goal is to maintain "the health and fighting efficiency of the troops" and to

maximize the number of lives that can be returned to the field of engagement, "to conserve manpower [for] early return to duty'' [3]. Although for civilian physicians drafted into war service, the ethical adjustments necessary to carry out military triage can be very stressful, in actuality the moral exigencies of triage in civilian mass casualty can be just as severe and emotionally draining. Triage, whether in civilian or military contexts, may force a physician to pass by one person who is in dire need in order to serve the greater number [4].

Refusal to Participate in the Conduct of War

Since the introduction of universal conscription (first established by revolutionary France in 1789 and forming the basis for the Napoleonic armies [5]), there have been people who have refused induction on the grounds of religious or moral beliefs against war or the use of violence. Physicians have been among them. These physicians are acting in conscience as moral or religious citizens, not as professionals bound by a particular ethical prohibition or obligation.

The occasion of the Gulf war has given rise to several physicians and nonphysicians in the military reserves refusing call-up orders. Some have asserted that under the pressure of choice they realized they had become conscientious objectors to all wars. Their situation thus falls into the category of moral citizens requesting relief from military obligations. One physician in the military reserves whose case has received some attention in the press refused in December 1990 to report for service in the Gulf on the grounds that she could not participate, even in a noncombatant role, in a war that carried the potential use of weapons of mass destruction. In objecting to this particular war and not to all wars in general, she stated that in her view to work as a physician in an enterprise that could result in the indiscriminate deaths of thousands of civilians was contrary to her moral beliefs and her interpretation of medical ethics.

The stance of this physician raises very interesting issues. In the case of Captain Howard Levy, a military physician in Vietnam chose to disobey an order that should have been seen as contrary to the Geneva Conventions, in that a physician is forbidden to use his medical skills for political purposes. In this current case, a military physician has chosen to disobey an order (a call-up to serve as a physician in the Gulf war) that the Geneva Conventions would deem entirely proper, in that the physician is ordered to do specifically that which is expected and protected by international law -- take care of the wounded in wartime.

The Nuremberg trial findings present a different, although overlapping set of arguments that might be used in defense of a decision not to support a particular war. The trials established three categories of crimes: war crimes (acts committed in violation of standard principles of international law); crimes against humanity (heinous acts against populations of civilians); and crimes against the peace (aggressive acts intended to provoke or lead to offensive war). It is possible that this particular physician, who seeks to find grounds for her refusal to support a

particular war, might seek a Nuremberg defense, in that the Gulf war in its planning phase might be seen as a crime against the peace, and once underway might arguably constitute a crime against humanity.

Whether or not one agrees with this possible characterization of the Gulf war, and whether or not such a defense is chosen, it cannot be invoked as a defense based in medical ethics. The Nuremberg trial findings in this respect apply to all people, regardless of training or profession, who in their interactions with the military may find occasion to disobey an order. There is nothing special in the standing or moral obligation of a physician that gives a physician a particular warrant to state or justify his or her objection to a particular war.

In fact, all existing codes of ethics and tenets of international law applying to medical personnel hold physicians to a primary and inescapable obligation: to take care of the sick and injured in peace and in war. In language brooking no exceptions, society has granted the physician certain rights and privileges, on the assumption that the physician has contracted to act selflessly and skillfully on behalf of each and every person who seeks care. For a physician to withhold or grant care on the basis of anything other than medical need (in the urgent act of triage) is to violate his agreement with society and to abrogate the responsibility conferred on him by the profession [6].

A Focus on Patients or Populations?

One might ask under what circumstances a physician is obliged to think in terms of the health of populations, as opposed to the health of individuals. This question might be seen as flowing directly from the contradiction created by the notion of triage, in that in certain instances society has sanctioned the decision of the physician to subordinate the needs of the one in order to attend to the needs of the larger number. Although on the surface this connection appears tidy, it is not. Nor is it direct. Triage has standing in medical ethics only when it is performed under the duress of sudden, massive, emergency need and only when it is used by all physicians in the actual activity of caring for the sick and injured [7]. Much controversy attends the application of triage methods to national policies attempting to address the dilemmas of civilian peacetime health care.

Yet there is a place and time, and we have reached it, for physicians to inquire into their responsibility for the health of populations. One could suggest that with the development of weapons of mass destruction, some wars, or all wars in general, constitute such a sweeping assault on public health that they should be opposed by all in the health care profession. Several organizations of physicians, including PSR and the International Physicians for the Prevention of Nuclear War, have taken as their mission the opposition to wars involving the use of weapons of mass destruction. In that context, and with the recognition that major conflicts now also involve the use of conventional weapons whose effects, in terms of destructiveness, are almost indistinguishable from weapons of mass destruction, PSR went on record

as opposing the offensive use of force in the Gulf and supporting all diplomatic means, including the full force of sanctions, to bring about a peaceful resolution of the crisis.

Such an organizational stance is in keeping with the public health efforts of physicians for the last 150 years, where speaking from a position of knowledge and responsibility for the health of populations, physicians have endeavored to influence social and political programs that have substantial impact on human morbidity and mortality.

However, this concern and responsibility for the health of populations is a relatively late addition to the bioethical tradition, only in 1980 specifically added to the principles of medical ethics as described by the American Medical Association [8]. In implicit recognition that there can be instances where the obligation to care for populations can conflict with the obligation to care for the individual patient, this public health responsibility has been defined and construed as parallel, but not paramount, to the fundamental responsibility the physician holds to ward his or her patient.

The public health perspective, when applied to the question of war in the modern world, can only lead to deep and serious concern about the short term consequences of modern war (the enormous numbers of civilian casualties, since the 1970s constituting 84% of all casualties of warfare [9]), and the longer-term impacts on society, infrastructure, and the ecology of entire regions of the globe. Increasingly, one can expect physicians and other health professionals to begin to speak out against war itself, the greatest inflictor of mass death in history, and incontestably now the greatest source of threat to the public health [10].

Conclusion

Physicians confronting the issue of war have as guidance for behavior a tradition of medical ethics that in general (and not without some contradiction) enjoins each doctor to attend primarily and fully to each individual patient and a body of international law that in narrowly defined circumstances in war not only supports, but requires, him or her to act in accordance with this tradition. The covenant that society has made with physicians, to grant them special status and access in return for their commitment to act to their utmost on behalf of each and every person who seeks care, holds only because physicians adhere to these tenets of medical ethics and international law.

In defense of the public health, physicians may seek to oppose the activities of society that lean toward mass death or social destruction. Justification for such action can be found in the existing body of medical ethics or international law, but does not permit exercising this obligation to the detriment of the first, primary injunction -- to care for the individual patient. Within the terms of medical ethics and international law, a physician can protest war till the moment it arrives on the

doorstep -- and then must stand in the door and begin treating the wounded as they arrive.

Physicians can choose, as citizens, to take other actions, such as refusing to serve as a physician in a particular war, but to do so they must step outside the province of the profession. When faced with the immediate need to treat the sick and wounded, people in white coats take care of patients. A physician who seeks to do otherwise must remove his or her white coat and face society as an ordinary, albeit thoughtful and moral, citizen.

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Footnote

1. The 10th declaration, made in 1956, the Declaration of Havana, 'Regulations in Time of Armed Conflict'; and in 1975, the 29th declaration, the Declaration of Tokyo, 'Guidelines for Medical Doctors Concerning Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment in relations to Detention and Imprisonment.' Also particularly relevant to the behavior of physicians in war is the Declaration of Helsinki, signed as the 18th declaration in 1964. 'Recommendations Guiding Physicians in biomedical Research Involving Human Subjects.' The World Medical Association. Handbook of declarations. Ferney-Voltaire, France, 1985. English edition printed by Inkon Printers Ltd., Farnborough, Hampshire, England.

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The Third Culture

In a variety of ways physicians have acquired a set of skills and patterns of thought that place them at some interface between the arts and the sciences. Perhaps we belong to a third culture, on "speaking terms" with the other two, as described by C.P. Snow in his lectures to Cambridge University audiences in 1959 and 1964 [1]. The problem of communication among the various disciplines of thought and knowledge was acute at the time Snow made his observations, but it was not new. From the end of the Middle Ages, the fields of knowledge have been expanding well beyond the capacity of one person or one group to encompass them.

From an unpromising beginning as barbers and blood-letters, for several centuries physicians devoted their attention to developing the art and science of medicine, with an intense and exclusive focus on human anatomy and pathophysiology. During epidemic bouts of plague, and then more continuously as the growth of cities spawned illness of many kinds, society turned to physicians to help describe, explain, and, if possible, prevent the transmission of disease in populations. This is still the principal focus of public health. It has been only in the last several decades that we have witnessed in substantial numbers the foray of physicians and other health care workers into several other areas of social concern, where questions of evidence and policy, impact and cause, highlight the limits of current social and scientific understanding and invite our attention. These areas of concern include the health effects of environmental change and toxic pollution, the health consequences of war and disaster, and the impact of political oppression on the health of the individual and the community.

In their approach to these questions, physicians see their tasks in analytical terms: assess existing data, develop initial hypotheses, gather further data, and arrive at tentative conclusions, all pending further work and exploration. Here in this issue of *The PSR Quarterly* we present several discussions that turn on these tasks -- in the various contexts of environmental contamination, modern war, and political oppression, past and present.

In exploring these subjects, physicians must be come familiar with the power and potential of their own discipline and its very real limitations. Medical modes of explanation, although dealing at the common boundaries of many disciplines, derive from and attend to only a tiny fraction of this vast area we call human knowledge. These modes of explanation are also not unique to medicine, yet as tested and useful patterns of thought and connection, they have proved central to the development of

our discipline and may well prove helpful in bridging the gaps in our current social understanding of the relationship between the technical and the human, the life sciences and the human life, individuals and populations.

The Epistemology of Medicine

We are as physicians, first of all, observers of detail. We are trained to notice things -- the way someone walks; the incidental dark mole, different from the last time you saw it on your patient's back; the new heart murmur; the faintest edge of a spleen tip.

Second, we have been trained to understand the ways in which the human body and human mind interact with external forces and internal processes. We have been taught the basic science, to the extent that it is known, that underlies, constrains, and determines the clinical pathophysiology we can observe. A bruise that is yellow and green did not result from trauma experienced this morning. Abnormalities on blood smear confirm for us whether a patient is anemic because of bleeding or because of hemolysis. We not only have been trained to see details others might not notice, but we are asked to develop plausible explanations based on scientific information for the causes of the symptoms and signs we observe.

Third, in our search for explanation, we have learned to acquire a certain respect for rules of evidence. The comprehensiveness and integrity of the data we use in developing explanations are absolutely critical to the validity of the conclusion. Who did the Gram stain of the cerebral spinal fluid? How was it done? Did you look at it yourself? From the years of experience we accumulate in training, we know the pitfalls and ambiguities in what appear to be straightforward statements of fact and findings. Physicians are aware that they must rely on data they receive from others. Collaborative medicine is very vulnerable to mistakes in data acquisition and transmission. Thus, in medical training a very high value is placed on one's reputation for veracity and reliability, and many systems are designed to create methodical layers of redundancy in data acquisition and verification.

Fourth, the ways in which we organize and sort data arise from a medical version of the scientific method that is deeply ingrained in us during our years of training. On the basis of the early range of data at hand, we construct a wide set of possible diagnoses (hypotheses) and then gather further data to support a process of ruling in or ruling out the possibilities on our initial list.

When we look closely at this process, however, it is evident that it differs to some extent from the process one might find at work in a basic science laboratory. The rule of parsimony plays a greater role in medical thinking than it does in the basic sciences, as does a reliance on pattern recognition or syndromes. These analytic tools represent shortcuts, comparatively streamlined methods to arrive at plausible explanations, which are particularly necessary in medicine, because physicians, in their quest for diagnostic certainty, have to act against time. Patients may be very ill,

and an appropriate intervention must occur soon in order for it to have a relevant effect on the disease process. In addition, there may be many patients to be seen that day and for each, within a short time, an answer, or the next set of steps toward the answer, must be found.

In this search, it is baffling to find data we cannot attach to any explanation. The most persistent failure in cognitive decision-making for all physicians -- whether in training or 15 years out in practice -- is the failure called "premature closure" [2]. The finest physicians are those who can resist this pressure to name the diagnosis, who can hold on to a notion of the "most likely but we still don't know," and who can continue to care for the patients and teach students in the setting of such ambiguity. This dual capacity -- to move quickly but soundly in the setting of incomplete information and to move again, but still methodically, in the face of new information -- is an essential feature of highly developed cognition in the medical model.

Physicians have also been educated to interpret and critique an extensive and complex research literature that ranges from basic science reports to epidemiologic studies. A familiarity with biostatistics, research protocols, and rules of inference characterize this education. As a fifth attribute of the physician's skills and perspective, this education has become progressively more important in the last 50 years, with the enormous increase in the volume of medical and public health investigation performed and published.

The final two attributes of the physician's approach to problems are not shared universally among us or acquired uniformly in the course of medical training. The sixth attribute is the capacity to communicate technical or scientific knowledge (and the limits of its certainty) to students in our own discipline, to our patients, and to members of the lay public. This obligation to teach and communicate rests on all of us, but some physicians are better at it than others. Hence the struggle to explain the indications, or lack thereof, for certain procedures; or the explanations needed to ensure that the patient will take his blood pressure and his heart medicines, both on a regular basis; or the difficulties we face in discussing the pros and cons of prophylactic AZT in the setting of needle-stick injuries.

The seventh attribute is the capacity to conduct significant formal research in the basic medical sciences, clinical trials, or epidemiologic studies. This capacity requires a strong intuitive sense of what is a real question, the tough thinking involved in developing a testable hypothesis from within that welter of questions, the diligence and creativity needed to construct the study design (including figuring out the dimensions and characteristics of the study population and the controls), and the knowledge of what research methods and tools to use.

These seven related aspects of the physician's approach to problems of individual patient illness describe a set of technical and human skills in analysis, synthesis, and communication that can be directed toward exploring larger social and scientific problems. Physicians, by definition of professional role and training, are located in a

nexus of experience, explanation, and translation. Indeed, with only mild hyperbole, one could risk saying that at this stage in the evolution of knowledge and technology, medicine has become one of the essential disciplines for describing or interpreting the human consequences of physical and social forces to those who live in the domain of political and moral decision making.

Health Effects of Environmental Change

Those involved in environmental risk and impact assessment are well aware of the gap between the massive amounts of physical and chemical data now accumulating and the formulation of testable hypotheses on human effects [3]. This view was elaborated in a report issued this year on the environmental consequences of nuclear weapons production [4]. Written by the U.S. Office of Technology Assessment (OTA), the report states that no one knows with precision the extent of environmental contamination that has occurred at any one of the Department of Energy (DOE) sites, let alone at all of them. No one knows how to define the limits of dirty and clean, contaminated and uncontaminated. No one knows how to translate these concepts, which arise from ecological vocabularies, into human health equivalents -- healthy or unhealthy, causing illness or not. Consequently, no one knows what the work or cost of cleanup might be. The OTA report went on to say that not only do we as a society have very little idea how to translate into human health consequences the radioactive contaminants from DOE weapons production now found in the surrounding environments, but we do not know how to make these connections for any number of toxic contaminants and pollutants that are also present.

War and Disaster

We live in a world that continues to be marred by war and disaster. Because world population size and density have increased logarithmically, the impact of national or technological catastrophe is felt by a greater number of people than ever before. Because the technologies of war have been honed to ever greater efficiency, and therefore lethality, the casualties are greater than ever before. Because war and disaster cause massive dislocations, the world now has more refugees than ever before; and because we all watch news and images transmitted from all corners of the globe, the distress of distant lands and peoples more easily becomes ours.

The morbidity and mortality caused by these events are increasingly being seen as suitable subjects for study and action by physicians and other health care workers. The question of impact assessment involves technical issues of data acquisition in the field, data assessment, hypothesis development, and responsible uses of information. These are demanding and complex issues. Few professionals are specifically trained to accomplish them, but physicians and other health workers have many of the necessary skills. Their observations and hypotheses, if borne out in further study, will help guide and structure policy efforts at prevention and mitigation [5,6].

Political Oppression and Civil Unrest

We also live in societies where during our lifetimes political oppression of many varieties has distorted human development, poisoned human discourse, and inflicted agony and death on a scale that has frequently dwarfed the mortality consequences of international war or natural disaster. In the context of political oppression or civil war, questions of human rights, and medical human rights, often surface. The reach of international law is often blocked at the borders of these countries, yet the abuses within are real. Although some physicians and other health care workers have been entrained to serve the oppressors, others have served among those who have resisted. The mission of outside medical experts -- to observe, find the facts, bear witness, and report back -- is giving substance and analytic support to those in the international community who seek to bring about change [7-10]. These efforts, when directed at past abuses and the consequences for survivors on all sides, convey much that is grim. Yet "the name of hope is remembrance" [11].

A Word of Caution

Physicians, in general, have spent their lives studying things other than politics, history, and sociology. The analytic skills of the physician, when used to help understand and assess the complex issues described above, should be employed within very consciously defined and defended boundaries. These boundaries are now being developed and tested by the many groups of physicians and health workers engaged in these explorations. Only if we can continue to speak with probity and care from within the framework of our discipline can we claim to serve a useful purpose as reporters and interpreters of data others have not seen, do not fully understand, or feel unequipped to approach.

When we embarked upon our careers in medicine, we were no different from our friends, who marveled at our choice, exclaiming they would have made it also, but "couldn't stand the sight of blood!" In our years spent gaining entry to this profession, we learned that blood is data, not symbol. Far from being cause to dissuade us from our mission, the sight of blood impels us to action and analytic thought -- why is it there, where is it coming from, and how do we stop it?

Increasingly, in this century, answers to difficult questions involve not only internal physiologic processes, but interaction with the environment -- an environment that must be understood as being al ways and inevitably physical and biological, social and political. The analysis of that interaction, and formulation of policies to control its hazards, requires the skills and thought patterns of those raised in a third culture.

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Editorial

Liberated, we have an opportunity to see more clearly than at any time since the end of World War Il. In convulsive fits and starts, the cold war has been losing its grip on our future and our minds. We can take stock of where we are, perceive the connections among things long obscured by deep shadows, declare what we can dare to rejoice in, and define what we really have to fear.

The year is not yet out, and its political wonders continue. In two days that shook the world, we were cast into dread and then exalted, as thousands thronged the Russian Parliament and crack troops refused to fire. We feared that the Soviet people would not withstand the tanks, and we found to our amazement that they would, and did, and did not for long have to -- and this because of something we had anticipated even less, the collapse of tyranny from within. The KGB files may tell us much about many. Yet even when all that is recorded and remembered is now told, we may never learn what happened to Raoul Wallenberg.

With the death of the Soviet Union as a strong centralized government, the land from Tallinn to Vladivostok will see new nationalisms, new borders, and much anguish. As the peoples of the Baltics make their own futures, they must come to terms with their recent past. In or out of the new union, the Soviet republics must attempt to nurture democracy as well as development, in settings where neither has much tradition. The West, replete with democracy and development, must revamp its foreign policy and give aid without crushing initiative, stimulate rather than dominate. The challenge is more difficult than that facing the U.S. in 1946 and 1947, as Generals Marshall and MacArthur helped to define the reconstruction of Europe and Japan. Then, the world was determined by one economic monolith and the choices were few. Now we live with many centers of economic strength and no one reigns supreme. If we wish to help, we must first learn how.

At a peak moment in U.S.-Soviet relations, when the new world order beckoned peace, we careened into war in the Gulf and emerged shaken. Even in the midst of battle, it proved difficult, in this day and age, to subscribe to the notion that, because Saddam Hussein was an enemy of the allied forces, so, too, were all Iraqi citizens. The "nationalization of truth" [1], so pervasive in earlier wars, did not establish much foothold in a conflict where CNN beamed back live images and the Soviet Union was nominally on our side. At the approaching anniversary of this war, one

that was very short and geographically contained, it is troubling how much still remains unknown and unresolved. The estimates of Iraqi civilian and military casualties each range ten fold. There is no concerted effort underway to gather the data on environmental costs or repair the damage. An appalling silence holds, broken only by very small and late voices, about allied actions on the Highway of Death and against those Iraqi soldiers buried alive in their trenches north of the Iraqi Saudi border.

No one has yet made a good accounting of what winning has meant. Except to distract us from our mammoth domestic obligations and to postpone grappling with whether and how to be the world's only policeman, this war has left us with a ledger that looks, on balance, pretty blurred.

As the superpowers cooperate, prospects improve for resolution of old and bitter issues in the Mid East and Southeast Asia. A handful of hostages and several scores of soldiers unaccounted for stand between stalemates familiar to us all and a roomful of possibilities. Among the ironies that always accompany the denouement of war and bloody conflict, it is turning out that the few who are missing, rather than the millions who were killed, now assume key roles as pawns in the game of negotiations and the realities of reconciliation. Now, 43 years after the onset of open conflict in the Mid-East and 15 years after the war in Vietnam, it all appears to hinge on the fate of a number of people so small we might even know all their names. As human beings, our failure to apprehend groups and our capacity to care about individuals is nowhere more evident than in this, the last reeling in of the remnants.

We have been freed to see, again, but in new depth of connection, the patterns and consequences of our actions as a developed world. The weapons we have built and sold and continue to use begin to weigh on us as never before. As the cold war rhetoric fades and we shift quickly into new paradigms of threat assessment, more of us realize and with more urgency how unutterably disastrous our current course has become. Instability in many places, for many reasons, will replace the threat formerly seen as coming from one place, for one reason. Weapons of mass destruction, in any hands, will do little to quell these new instabilities and much to fan them. The trade in conventional weapons has made virtual paupers of all countries, developed or not, when seen in the context of needs we have not met. The price is too great to bear. Increasingly, people in many countries, including the U.S., are telling their leaders to desist from this course of death and disruption and adopt different priorities. We have bridges to build, roads to repair, children to feed and educate, people to care for, diseases to defeat, and, beyond all that, another world, still in some parts green and blue and populated with other species, which we must hasten to protect.

We have lived dangerously, treading on living things, human and otherwise, in the pursuit of important abstractions and strategic objectives. It continues to be important to defend democracy at home and abroad, to ensure the flow of trade in key materials, and to allow access to key resources. Yet we can now demand that the

United Nations be permitted to grow to full stature, taking on definitively the responsibilities for maintaining the rule of law and securing the reach of human rights. Even before this prospect has materialized, we can begin to look back, tabulating the comprehensive costs of war, and to look forward, working to establish viable restraints on such future behavior.

We have lived profligately, failing to recognize what other species have been forced to accommodate to, the limits of growth. For humans, these limits have appeared to be more provisional, subject to technological fixes we have applied with a vengeance. These technologies create their own hard ships and interact with human systems in ways that can inevitably lead to major accidents [2]. In essence, they have allowed us to live beyond our means. In 35 years, there will be 8.5 billion people on earth -- 1.7 times the population we are now trying to feed and support through adulthood [3]. For several years, there have been no fish in the Aral Sea, the fourth largest lake in the world [4]. The rain forests are dying at an annual rate of 42 million acres -- the surface equivalent of the state of Washington [5].

Liberation comes with no time to spare. It may be too much to hope that the world community will rise to the occasion and collectively reclaim, rectify, and recover. This break in the clouds may yet be seen to have come too late. Certainly, had it not occurred, were we still locked in that tenacious polarity called the cold war, still squandering all possibilities, we would now have less to do and less to talk about. In this issue, we explore many of the questions broached above, proceeding as if we had world enough and time.

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