
NEWS AND VIEWS

CONFERENCE REPORT

The Second Congress of International Physicians for the Prevention of Nuclear War, Cambridge, 3-7 April.

THE decision of Council (see February Journal p. 123) to advise the President not to attend the Cambridge conference has been widely criticized. The editor of the Journal was sent in his place as an observer, and has written the following report.

Background

In 1979 Dr Bernard Lown, Professor of Cardiology at the Boston School of Public Health, met Dr Evgeni Chazov, President of the National Cardiological Society of the USSR, in Geneva. Having been friends for some years, they had come to know that they shared a concern about the rising likelihood of a major nuclear exchange. At that Geneva meeting, they decided to mount an international conference and to establish an organization to be called International Physicians for the Prevention of Nuclear War (IPPNW). The conclusion of that congress, which was held at Airlie House, Washington, DC, in March 1981, was widely reported in the USA and USSR (and in the *Lancet* of 4 April, p. 790). The 73 doctors who attended issued the following Appeal to the Physicians of the World:

"Dear Colleagues:

We address this message to you who share our commitment to the preservation of health. Our professional responsibility has brought us together to consider the consequences of the use of nuclear weapons.

We have participated in full and open discussion of the available data concerning the medical effects of nuclear war and its effects on our planet. Our conclusion was inescapable—a nuclear exchange would have intolerable consequences.

Enormous numbers would perish in the first hours and days of a nuclear war. The wounded survivors, burned and affected by nuclear radiation, would face unbearably difficult conditions, without effective medical aid, water or food. The consequences of a nuclear war would also be disastrous to succeeding generations. A major nuclear exchange would inevitably bring extensive long-term consequences even to countries not directly involved.

No one should be indifferent to the nuclear threat. It hangs over hundreds of millions of people. As physicians who realize what is at stake, we must practise the ultimate in preventive medicine—avoidance of the greatest hazard the world will ever know. Your help is needed in this great endeavour. We urge you:

1. To inform yourselves, your colleagues, and the general public about the medical effects of nuclear war;
2. To discuss the medical consequences of nuclear war at meetings of members of medical societies, special symposia, and conferences;
3. To prepare and publish in the medical press and specialized journals articles about medical consequences of the use of nuclear weapons;

4. To speak about medical consequences of nuclear war to medical students and to your community;
5. To use your influence and knowledge to help strengthen the movement of physicians for the prevention of nuclear war."

The College Becomes Involved

In September 1981, the President of the College, Dr John Horder, was invited to the second congress, for which a place and time had by then been arranged, and in December he asked Council to advise him on whether or not he should go. A short summary of the debate was printed in the *Journal* (February issue, page 123) and on 14 December the Honorary Secretary of Council wrote to the organizers:

"Dear Dr Fielding,

I am writing to you regarding your recent invitation to our President to attend the Cambridge Conference on Nuclear War next year. You will understand that, because the President is the head of our College, he cannot appear at public and official functions as a private individual. Although he had provisionally accepted the invitation, he rightly felt the need to consult our Council at this stage and members of Council spent some time discussing how they should advise him at their recent meeting.

We understand the aim of the Conference is to inform those present, and, through them, the bodies they represent about the effects of nuclear war in Europe. We believe this to be important and we believe that the effects of such a war to be so serious, that all responsible doctors should be knowledgeable on these matters.

You will know of our President's concern for the possibility that such a meeting, however, could easily become a political as opposed to a purely scientific one and you were kind enough to write to him recently to reassure him on this point. Council believes that it is impossible to be absolutely certain that the meeting might not become political and of course, if that happened, regardless of what political views might be expressed, it would place the President and our College in a potentially difficult and embarrassing situation. At the same time, for the reason expressed above, my Council does wish to be informed of the scientific content of the meeting.

I am writing to inform you therefore that Council has advised the President he should not attend and he has accepted this advice. We would like to send an observ-

er in his place, if we may, and Dr S L Barley has agreed to take this on and report back to us. I hope that he will be acceptable to you and will leave you to send him further details."

The Conference—Aims

The second congress met to study in closer detail the dangers of a nuclear exchange in Europe and to widen the international medical expression of concern. In a letter to the participants the organizing committee said:

"The arms race and the threat of nuclear war are political in their origins, and will be considered in the plenary session as part of the background to our workshop studies. Our concern is not, however, with political causes or solutions. The special contribution which we as physicians and other experts can make derives from our careful consideration of the medical and psychological aspects of the build up of nuclear arsenals and the consequences of their use. This is the realm of our expertise. It is the essential basis of our claim to be heard. Among participants there will of course be different opinions, political and otherwise, about the causes of international tension and how it should be diminished. We urge you to exclude these from the formal discussions of the Congress workshops and symposia. Whatever our differing socio-political views, we meet as physicians bound by a common ethic with a compelling tradition of care for the health and survival of mankind."

Plenary Session

In addition to the 200 delegates and observers, a further 200 people, mostly involved in the Medical Campaign Against Nuclear Weapons (MCANW), had been invited to this session only, which was chaired and opened by Sir Douglas Black, President of the Royal College of Physicians. "In 1840," he said,

"... when Lord Macaulay wanted to emphasise that the long history of the Roman Catholic Church was likely to be matched by an equally long future, he suggested it would still be there 'when some traveller from New Zealand shall, in the midst of a vast solitude, take his stand on a broken arch of London Bridge to sketch the ruins of St. Paul's'. Macaulay would not, I think, choose that image now, for it has lost its essential character of being a remote possibility. Moreover, no New Zealander in his senses would come to a country which had been ravaged by nuclear destruction, and whose surviving inhabitants would be trying to maintain some semblance of sufficiency for a 20th century population with facilities no better than mediaeval. I think that as doctors we have a duty to point out, not only that there would be many casualties in the event of a nuclear attack, but that if there were millions of survivors they could not be fed or cared for.

Having said that, I do not think as doctors we have any special mandate to dictate to politicians the precise steps needed to avoid nuclear warfare, nor for that matter warfare of any kind, which must be the ultimate objective. Of course, as citizens we may have thoughts, but they carry no special authority arising from our profession. (I should perhaps add at this point that I am of course speaking as an individual, and not giving 'a College view' on matters on which I suspect Fellows and Members of my College would be considerably divided.)

It is right and proper that International Physicians for the Prevention of War should have been initiated by an

American and a Russian doctor; for they are citizens of the two powers on whom the greatest burden of responsibility at present lies. But it is a mistake to think of the world as being divided into two simple camps. Think of Chinese and Moslem powers, and the dangers in the Middle East or in Central America. Surely sanity must point to the abolition of nuclear weapons, and ultimately of all such similar weaponry. I am glad to have the opportunity of wishing you a successful and influential Congress."

The Co-chairman was academician N. Blockhin, President of the Soviet Academy of Sciences. He had taken the place of Dr Chazov, who had broken his leg shortly before. Dr Blockhin said that the international physicians' movement against nuclear weapons had met with wide acclaim from the Russian people, doctors and scientists, and he went on to describe the Soviet equivalent of the British MCANW, whose chairman was academician Chazov. This organization conducts research, and provides publicity through the media and through books. He ended by reading a personal message from President Brezhnev, wishing the congress success.

The Physical and Biological Effects of a Nuclear War in Europe

Sir Douglas Black introduced Professor J. Rotblat, Emeritus Professor of Physics in the University of London, who described what would happen if a nuclear war occurred in Europe. The following is a condensed version of Professor Rotblat's lecture:

"The physical and biological effects of a nuclear war are the end products of the physical and biological effects of nuclear weapons, but they cannot be simply deduced from the latter. The difference is not just a quantitative one, that in a nuclear war many nuclear weapons would be employed. The difference assumes a qualitative character because of interactions between effects occurring when a number of weapons are detonated.

If a single nuclear bomb were to be detonated very high in the atmosphere, at an altitude of 100 kilometres or higher, no immediate casualties are likely to result, but should this explosion be carried out in conjunction with other nuclear weapons detonated nearer the ground, then the disruption of electricity supplies and radio-communication by the electromagnetic pulse from the high-altitude explosion, could play havoc with planned rescue operations and life-supporting systems, with the result that many injured people, who might have been saved, would inevitably die.

The physical effects resulting from the various phenomena accompanying the explosion of a nuclear weapon are structural damage by the blast wave, fires by the heat flash, induced radioactivity by the neutrons, radioactivity of the fission products from fall-out, electric surges by the electromagnetic pulse, and the results of atmospheric disturbances (of significance only when a large number of nuclear weapons are exploded) consisting in changes in ozone concentration and in the reduction of sunlight due to the injection of large quantities of particulate matter.

The biological effects which may result from these physical effects are: the blast wave, bringing death and injury to people and animals; the heat flash, causing severe or fatal burns in people and animals caught in the path of the thermal pulse, as well as injury and death from the fires; the initial radiation, producing instantaneous whole-body exposure, with lethal doses being received by people and animals sufficiently close to the explosion; the local fall-out, presenting chiefly an

external hazard of acute exposure from the gamma-rays emitted by the radioactive substances deposited on the ground; and the global fall-out, presenting a long-term hazard mainly of a different nature: internal irradiation from the ingestion of radioactive materials which have entered the food-chain after being deposited on the soil. The atmospheric changes may have a disastrous effect on plant life, resulting from the blotting out of the sun.

All these effects of nuclear weapons can be described in quantitative terms, but there are considerable uncertainties attached to any numerical estimate. These uncertainties are small compared with those applying to the consequences of a nuclear war, since the following additional parameters come into play:

1. *Explosion parameters.* The explosive yield of each weapon, the fraction derived from fission, the materials used in the assembly of the bomb, and the altitude of the detonation.
2. *Target parameters.* Military and industrial installations are often situated on the outskirts of cities, and an error in targeting may result in the centre of the city receiving the hit. The type and structure of buildings and the nature of the terrain may greatly influence the number of casualties.
3. *Seasonal parameters.* The time of the day and the time of the year.
4. *Atmospheric parameters.* Temperature, visibility, humidity, precipitation.
5. *State of preparedness.* Would governments give early warning, with the inevitable economic and societal upheavals which may turn out to have been completely unnecessary? Or, would they try to avoid alerting the enemy if precautions are made, thus risking being caught unready with regard to measures requiring early action?
6. *Post-war conditions.* How many of the survivors die would depend on a number of very important factors such as the state of hygiene of the population, shortfall of medical care, likelihood of epidemics, lack of food, shortage of housing, failure of communication, economic and social disruption, and breakdown of governmental control.

As an illustration of how much these various parameters may influence the casualty toll, a Rand Corporation computer programmed to calculate the fatalities in a scenario of a limited nuclear war has shown that the death toll may vary by more than a factor of 50.

The best estimates of the number of casualties in a nuclear war are probably those of the Office of Technology Assessment (OTA) of the United States Congress. In one of their scenarios, in which the United States is attacked by the Soviet Union with a total of 6,500 megatons, between 60 and 88 per cent of the population of the United States were calculated to have been killed. These figures did not include the casualties which would occur subsequently from long-term effects.

In Europe the population density (excluding the Soviet Union) is 4 times higher than in the United States. In the UK, the population density is even higher (7 to 10 times greater). A smaller number of bombs would therefore suffice to bring about the same toll as in the United States.

One can make all sorts of assumptions about the dimensions of the war in the European theatre, but the scenario I am using is essentially the same as the OTA's, adapted to European conditions. I assume the bulk of the attack would be from Soviet eurostrategic and tactical forces; altogether 1,500 megatons. The corre-

sponding attack on Eastern Europe, but not including the European part of the Soviet Union, would involve 500 megatons of the NATO forces.

Of the total of 2,000 megatons, one third would be targeted on cities with a population of 100,000 or over, of which there are 378 in Europe. Seventy-three are in Eastern Europe. The total number of people living in them is 205 million, (about 42 per cent of the total population in Europe). Deaths from blast effects would be some 150 million. Of the survivors, about half would be injured: many of these would die in the absence of medical care. If smaller bombs adding up to the same total explosive yield were used, the number of casualties could be even higher, approaching 100 per cent.

The other two thirds of the 2,000 megatons would be exploded over the rest of the continent, targeted on military centres (missile bases, naval ports, air bases, submarine bases, command control, early warning and intelligence systems, supply depots) and economic targets (iron ore, steel, aluminium, cement and chemical plants, oil refineries and power plants, in particular nuclear power stations). Most of the casualties would be due to local fall-out.

In some parts of Europe the density of targets is such that the cigar-shaped contours of the fall-out would overlap and the whole region would be covered nearly uniformly with a deadly blanket of radioactivity; in other parts of Europe the lethal areas would be separated by regions with sub-lethal levels. About one third of the total area (the more densely populated part of Europe) would be contaminated to such an extent that people in the open would receive a lethal dose in 24 hours. About 150 million people might be dying from acute radiation exposure. By staying indoors, at least for part of the time, many people would receive smaller doses.

The effects on the fauna and flora would indirectly contribute to the human casualties. The heat flash from the bombs would cause severe burns to animals and kill many of them. Fires are certain to start from the ignition of dry grass and leaves. The burning areas might coalesce into one huge fire, and spread well beyond the initial zone of ignition. In forest areas, such fires could be truly devastating and go on burning for many weeks.

Many animals, particularly livestock, are sensitive to radiation to about the same degree as man. Being in the open, they would be exposed externally to the gamma-rays from the fall-out deposited on the ground, but in addition, they would be subject to internal exposure from eating contaminated grass. A high proportion would be killed. Plants would also fall victim to radiation exposure. One megaton bomb could destroy by radiation a coniferous forest over an area of nearly 400 square kilometres.

Different species of plants and animals have widely different sensitivities to radiation, and this could have serious ecological consequences. On the whole, the higher the species is on the evolutionary scale the greater is its sensitivity to radiation. Birds are much more sensitive than insects, and the killing of birds may result in a large increase in insect population, which in turn would cause enormous damage to plants.

The main atmospheric disturbances would be increased ultraviolet radiation following the depletion of the ozone layer in the upper atmosphere by the catalytic action of nitrogen oxides formed at the explosions. Such an effect would occur if nuclear bombs of very high explosive yield were used, because the mushroom cloud from such weapons rises right up into the stratosphere. With weapons of lower yield, a few hundred

kilotons, the mushroom reaches only the troposphere, and here the atmospheric disturbances have quite a different character. Most of the effects would follow from the injection into the atmosphere of huge quantities of particulate matter and gases from the formation of craters in low altitude explosions. Some of the ground material displaced by the bomb would be thrown up into the atmosphere as fine dust, and could remain suspended for a long time. A one megaton bomb may inject about 50,000 tonnes of matter. Other sources of particulate injection would be the numerous fires (in industrial centres, chemical plants, forests and oil and gas installations) and the production of ozone in the troposphere. In that part of the atmosphere the nitrogen oxides favour the production of ozone rather than its depletion, which takes place higher up.

All this would create severe smog conditions throughout the northern hemisphere. The loading of the atmosphere with light-absorbing particles would be so heavy that the amount of sunlight reaching the ground would be reduced by a large factor, perhaps more than a hundred, causing darkness in daytime. There would be catastrophic breakdown of agriculture and much of the food production throughout the northern hemisphere would be eliminated. As the people in the Third World depend for their survival on the supply of grain, fertilizers and other vital commodities from the industrialized countries, hundreds of millions of the inhabitants of the poor countries would die as a result of the war between the rich countries.

The hundred million Europeans lucky enough to have survived the actual war, may find life in its aftermath hardly worth living. They may perish from lack of food, from epidemics, and through violence between rival factions struggling for survival."

The Medical Consequences of Nuclear War

These were discussed by academician M. A. Ilyin, Chairman of the National Commission for Radiological Protection and Director of the Institute of Biophysics at the USSR Ministry of Health. The following is a shortened version of what he said:

"The logic of a present-day nuclear conflict renders unrealistic any plans to localize a nuclear war. The use of any territory for the deployment of strategic arms would inevitably result in involving the country concerned in a confrontation between nuclear powers, wherever such confrontation may occur.

The present generation has come to associate the devastating consequences of the use of nuclear weapons mostly with the US atomic bombing of Hiroshima and Nagasaki (bombs of 12.5 and 22 kilotons). Under current classification those were low-yield weapons, and the survivors could count on outside assistance. In current terminology Japan was subjected to a limited nuclear strike.

Today the aggregate destructive power of nuclear weapons accumulated in the world is equivalent to several million atomic bombs of the type used against Japan. One nuclear missile submarine carries nuclear explosives far outstripping the aggregate destructive power of munitions exploded throughout the entire history of wars since the discovery of gunpowder. A nuclear submarine of the Ohio class has 24 Trident-1 missiles with an aggregate destructive power of 19,200 kilotons, or 600 times greater than that of the bombs dropped on Japan. In one salvo an Ohio submarine can strike some 200 targets, delivering to each of them an explosive device five times more powerful than the one dropped on Nagasaki. Massive use of nuclear weapons

involving various delivery systems would render pointless such notions as "state borders" and "outside assistance".

The actual consequences of a massive use of nuclear weapons will be more catastrophic than the theoretical estimates based on a simple addition of the effects of single explosions. It is impossible to take into account numerous aggravating circumstances and developments brought about by social, economic and political consequences resulting from the devastation of hundreds of towns and population centres, contamination of vast areas due to fallout and a casualty toll running into dozens of percentage points of the overall population. The numbers requiring medical and other assistance would greatly exceed the remaining capacities for providing it.

The available estimates of possible casualties among the population must be viewed as being at the lower end of the actual range of estimates.

To get a general idea of the likely medical consequences of a possible nuclear war in Europe, I shall assume a 1,000 Mt nuclear attack and 1 Mt single yield weapons. It is assumed that one half of nuclear devices are exploded in the air and the other half on the ground. Five hundred ground explosions are spread over the entire land area. Five hundred air blasts are made above 500 major cities of the continent, among them 44 cities with a population of over 1 million, 108 with a population from 300 thousand to 1 million, and 348 with a population from 100 to 300 thousand. The average lethal effective radiation dose induced by fallout among the survivors of an air nuclear blast is assumed to be 450 rad while for those affected by an air nuclear explosion (suffering from burns, wounds and combination thereof) the average lethal effective radiation dose is assumed to be 200 rad.

The overall picture of medical consequences brought about by immediate injuries due to such nuclear explosions includes:

1. Civilian casualties in 500 cities due to air explosions.
2. People who would die or be injured in the target cities which would be in the area of highly radioactive fallout produced by ground explosions.
3. Civilian casualties in areas hit by ground nuclear explosions.
4. Dead or injured among the rural and urban population who would be affected by local radioactive fallout produced by ground explosions.

The results are shown in the Table; nearly 170 million will be dead and almost 150 million will be injured. That

Table 1. Estimated casualties (millions) among the population of the European continent due to nuclear strikes with an aggregate destructive power of 1,000 megatons.

Nuclear explosion factors affecting the population	Total		
	Dead	Injured casualties	
Immediate impact of 500 air blasts above major cities	97.7	57.5	155.2
Impact of radioactive fallout from ground explosions in cities hit by air blasts	14.8	14.2	29.0
Immediate impact of 500 ground explosions in target areas	2.3	3.4	5.7
Impact of radioactive fallout from 500 ground explosions	52.9	70.9	123.8
Total	167.7	146.0	313.7

Source: Ilyin, "Possible medical consequences of a nuclear war for the population of the European continent", paper given at the Second Congress of International Physicians for the Prevention of Nuclear War, Cambridge, April 1982.

mass of injured people will be deprived of effective medical assistance, primarily because it will be physically impossible for a few surviving and able-bodied doctors and medical workers to provide it. People who survive the catastrophe will be haunted by physical and psychological suffering and endless woes. The living will envy the dead.

That half of the population not directly affected by the injury factors of nuclear explosions will not receive fallout doses that generally cause severe radiation sickness. Yet all of them will inevitably receive doses far in excess of natural levels of background ionizing radiation. They too should be considered to run a higher risk of developing malignant tumours. People not directly affected by the use of nuclear weapons will in all probability also be faced with a host of most difficult problems resulting from the destruction of the social and economic fabric of the life of society.

In conclusion I would like to stress that for the purposes of this study I have chosen an estimate of the destructive power of nuclear weapons exploded over the European continent which is a mere 10 per cent of the aggregate 10,000 Mt which, according to many estimates, may be used in a nuclear exchange between the opposing sides. It must also be borne in mind that it will not be possible to confine a conflict to Europe.

The total impact on the biosphere and the natural human habitat may be fatal."

The Long-term consequences of Nuclear War

These were presented by Dr T. Ohkita, Professor of Haematology at the Research Institute for Nuclear Medicine and Biology at Hiroshima University, Japan. He specifically discussed how the Hiroshima and Nagasaki explosions had affected the rates of cancer and of chromosome damage. Acute leukaemia was the earliest malignant change observed, with an incidence reaching its peak in 1951 (15 times the expected rate in Hiroshima, and 7 times in Nagasaki). Malignant solid tumours (thyroid, breast, lung oesophagus, colon, urinary tract, myeloma) began to increase in about 1960, and have shown the same dose response to radiation as the leukaemias. Chromosome abnormalities can still be seen 30 years later, in the lymphocytes of the survivors. The proportion increases with the radiation dose. The clinical significance of these blood cell abnormalities is uncertain, and most survivors who show them are in good health.

Film: Hiroshima and Nagasaki

Lasting only 20 minutes, this film produced a very marked effect on the participants, since it consisted mainly of news-reel material shot in the two cities within a few days of the bombs being dropped. Most of the audience were extremely disturbed to see the kind of injuries being treated (mainly burns and radiation sickness) and the scale of physical destruction of two large cities.

Psychological Effects of Living Under the Threat of Nuclear War

This comparatively new field of work has become the speciality of a small group of psychiatrists, mainly in the USA. Detailed consideration was given to it by Professor H- E. Richter, Director of the Centre for Psychosomatic Medicine at the Justus Liebig University, Giessen, West Germany. The following is a condensed version of his paper:

"According to opinion polls in the United States and several Western European countries, large portions of the population assume that a great war could break out in the foreseeable future and of these people most expect it to be a nuclear war. Nevertheless, it appears

on the surface that most people are not particularly upset by these thoughts. I do not want to simply confine myself to tracing the reasons why many people apparently accept the growing threat of nuclear war with a peculiar kind of passivity or even partly with hopeless resignation. To limit my discussion in this way would mean that I, as a scientist, was also indirectly resigning myself to accept this passivity. Instead, we must ask ourselves: 'What could happen, in order to change these apathetic reactions? And what could move people to actively involve themselves in averting this danger?'

Although the psychological effects of the threat of war differ from one nation to another, there are obviously common patterns of reaction. In the Federal Republic of Germany, the most recent opinion polls reveal a growing pessimism. At no other time in the last three decades has this pessimistic mood been so marked as it is today. A third World War appears possible or probable to 48 per cent of West Germans. Every other young person between the ages of 18 and 24 expects that the world will be destroyed by nuclear war.

Why does this oppressive nightmare remain, for the most part, unspoken? Many people consider it useless to try to exert any influence on the politicians. 78 per cent of West Germans (86 per cent among younger people) agree that most politicians do not know what ordinary people are thinking.

In recent years the signs of disquiet have increased, one expression being the peace movement. The peace movement and the conflicts which it evokes are symptoms of a process of social disintegration. We must assume that the pessimism uncovered by the opinion polls is giving rise to tensions which can no longer be collectively held in check. Fear and outrage are now being openly expressed among elements of our youth. However, these protesting young people are only channelling the pressures which burden all of society. The youth fall into this role because they have an especially fine sensitivity (typical for their age) for social conflict, because they react more impulsively than the older generation, and because they are especially sensitive to anything that endangers their future. After all, they have the longest future before them. It is thus possible for a great part of the older and more established generation to split off their fear and to some extent project it onto the young people, who then articulate their discontent through the protest movement. The delegation of this fear helps older people to defend their threatened self-reliance. Their conflict with the fears of young people enables them to repress their own anxieties.

Between these polarized factions is a silent majority. This majority's frame of mind has been described in many ways, for instance as a possible melancholy pleasure in contemplating one's inevitable doom, which is compared to the inclination of human beings to suppress thoughts of their own mortality. Denial appears to provide a temporary benefit to psychic health, although it is irrational in political terms, since it inhibits the powers of resistance against the threat itself.

Denial is especially favoured by five factors:

1. Modern weapons of mass destruction appear to have effects so monstrous as to be humanly unimaginable. The horrible becomes abstract and nebulous if it lies beyond what the senses can conceive. Thus, we call anything which could ignite a possible nuclear war 'inconceivable,' 'incredible,' or 'indescribable.'

2. Habituation. The fact that we have lived for over thirty years under the atomic threat without anything happening can lead to a deadening of our awareness.

3. There is a widespread, naïve belief that something cannot happen simply because it is too unreasonable. To make use of the horrendous and bulging arsenals of overkill-weapons seems to be totally senseless and therefore impossible.

4. Many people feel that world politics is only continuing the kind of behaviour that all people experience in their daily relationships.

5. Displacement. I will explain this with a brief clinical example. A girl learns that her mother is suffering from an incurable case of cancer. She suddenly has the fear that she may find a dead bird on her way to school. As a result, she does not want to go to school any more, so that she need not encounter this dead bird. This all means that she has diverted her fantasy from the imminent death of her mother and displaced it onto the idea of the dead bird.

This last mechanism provides an explanation for the recent preoccupation of many people with anything in the everyday world that could threaten their property and themselves. Never before has so much worry been expended on wholesome nutrition, body weight, blood pressure and medically approved physical exercise. People try to insure themselves against anything and everything. One senses a feeling of insecurity wherever people imagine they can actively decrease any risks to their own security. These people invent, so to speak, large numbers of dead birds, in order to avoid thinking about the greatest and most sinister danger.

Yet, the denial is very incomplete. Many people see the dangers of atomic war quite clearly, but hold fast to the notion that only the other side's weapons are menaces. The more warheads their own side produces, the safer they feel. Their own atom bombs seem good and necessary for holding in check the external enemy, who is viewed as the sole aggressor. For various reasons, it is possible to bring about psychic relief by portraying the enemy as a devil. I would like to describe these reasons from the standpoint of a Westerner who sees the Russians as demons.

By seeing only the Russians as a threat, I have fixed my fear on an object which my mind is able to grasp. The Russians put me in the position of being an innocent victim of persecution. Thus, I personally have nothing more to do with creating the menace of nuclear war. My moral burden has been lifted. Moreover, I can partially transform the discomfiting fear into hate. I can exchange my passive position for an active one. After all, the communists in Moscow, who wish to put me in their power, deserve to be abhorred and resisted. Finally, I avoid being an outsider. By fixing my image of the enemy in the East, I know I am in agreement with the rulers of my own nation and can count on their protection at any time.

Of course, the same elements of psychic relief can be found in any communist in the East who views the Americans as devils.

The British physicist P.M.S. Blackett said in 1948 that, 'Once a nation bases its security on an absolute weapon, such as the atom bomb, it becomes psychologically necessary to believe in an absolute enemy.' The German-born physicist Max Born also said (1960): 'To quiet the consciences of human beings concerning military plans which conceive of the killing of tens or hundreds of millions of men, women and children on the other side—and on one's own side, which is not even mentioned—the other side must be viewed as essentially

corrupt and aggressive'. This prophetic thought has already been fulfilled to a great extent. Large segments of the populace live in a psychic condition which a psychiatrist must call 'collective paranoia'. The criteria for such state of mind are as follows:

1. One believes that all measures taken by one's opponent are essentially aggressive in nature.
2. This image of the enemy cannot be corrected.
3. Whenever opposition arises in one's own camp, it will automatically be blamed on the dark, sinister machinations of the enemy.
4. One is just as uncritical in idealizing whatever one's own side does. There can be no doubt that one's own party represents goodness, justice and humanity.
5. This sense of persecution absorbs one's concentration so much that one is blind to the ways in which one can be endangered by precautions taken against the other side.

Thus, many people let themselves be persuaded that a great war could actually defend certain values or achievements of their own political system, but overlook the fact that such a defence will quite probably mean mass suicide, making the idea of defence an illusion.

The persecution mentality is now being systematically inflamed by the official deterrent policies of both sides. It is important to explain this relationship. The governments of both sides start with the assumption that a war can be prevented by threatening one's opponent. One can make such threats only if one can stay in the armaments race. But the weapons alone do no good unless the people themselves are ready to actually use them. Psychological armament must keep pace with arms production. If this does not happen, deterrence would be endangered and—according to this philosophy—peace itself. If either side were to relax its determination to set the apocalypse machine in motion, this could trigger aggression by one's opponent. Psychological militarization counts as a decisive element of a credible deterrent.

But as the total destructive potential now exceeds the amount sufficient for deterrence, people may begin to doubt whether they still ought to sanction the eventual use of these destructive forces. To suppress this doubt, governments must increase their efforts to maintain the collective persecution complex.

This is the paradox of the social-psychological situation in which we now live. We are taught that peace is threatened by the outbreak of a peace-loving attitude. Since we must assume that this dynamic functions reciprocally on both sides, it is hardly imaginable how people can release themselves from this paranoia.

A further complication makes it even more difficult to heal this paranoia, which we must assume hardened long ago into a kind of philosophy based on hatred and mistrust. Most people are not aware of its emotional basis, but this hatred and mistrust are expressed in concepts and language which have become abstract and technical. The emotional aspect has become practically invisible. We speak of peace as if it were only a technical matter. It is as if the rockets had absorbed our aggression. Instead of looking at our own motives, we look only at the weapons, as if these were the real main characters on the international stage. It seems as though the numbers, the development, the destructive energy and accuracy of the rockets determine by themselves whether or not the holocaust will someday explode. The result is that for years military technocrats have dominated discussions of security policy.

The infinite escalation of mutual threats proves that forces are at work here which will push the deterrent policy to absurdity, however logical this policy may seem in itself. Yet the revelation of just these decisive emotional forces is taboo. We act as if the motives of hatred and mistrust are only the irrelevant side-effects of objective events.

Albert Einstein said: 'The precondition for a real solution of the security problem is a certain mutual trust by both parties, a trust which cannot be replaced by any kind of technological measures'; and: 'Everyone sees that under the present conditions a serious military conflict must lead to the annihilation of all mankind; nevertheless, men are unable to replace cunning and mutual threats with benevolent understanding.' We must attempt a basic rehabilitation of the psychological dimension of our security policies.

There is a reciprocal relationship between the threat of atomic war and the psychic constitution of human beings. By itself, the threat of nuclear war is not a fate which automatically results from the modernization of weapon systems and strategic concepts, but is first inflated by mankind's psychic impulses, which are then reflected in a corresponding policy. We have the mutual reinforcement of paranoia on the one hand and high levels of armaments on the other.

The German peace researcher, Carl Friedrich von Weizsäcker, has declared that the absence of peace is essentially a psychic disease. How can we rid ourselves of this sickness? In 1959 Karl Jaspers gave top priority to the demand that we overcome our 'refusal to know.' 'We must think about something every day, if it is to have some consequence within us.' Such abstract counsel is not effective enough against the tendency to deny. A better method consists of presenting the manifestations and effects of nuclear war as vividly as possible. Films such as the one on Hiroshima or *The War Game* are well-suited to breaking through the barriers of denial. In addition, presentations which clearly explain the effects of bombs exploding over the listeners' own hometowns can force people to look honestly at the situation. Public announcements by physicians' organizations, stating that medicine would be powerless in case of a nuclear war, can also shake people out of their complacency.

We physicians have a special and legitimate contribution to make to this psychic reorientation. Our profession is destined by its special ethics to overcome this viewing of friend and foe in absolute terms. We are obliged to give help without distinguishing between friend and enemy. Our mission, to commit ourselves at all times to the protection of human life and health, forbids setting our priorities according to the principle that some lives are more worth saving than others. This holds true for both our therapeutic and preventive duties.

How can we shape our contribution most effectively, in order to promote the healing of the psychic disease of paranoid suspicion? Helping people become aware is more important than moralistic appeals. Einstein said: 'In the shadow of the nuclear bomb we see more and more clearly that all men are brothers. If we recognize this simple truth and act accordingly, then humanity can move on to a higher plateau.' It is thus a question of simple awareness that nuclear war is indeed a common peril. There are many indications that decisive energies for social self-healing are beginning to appear. If this assumption is correct, then it would be a truly fitting task for us, as physicians, to support these tendencies with all our powers."

The Effectiveness of Civil Defence in Nuclear War

A short paper was given by Dr R. J. H. Kruisinga, of the Ministry of Health and Environment, The Netherlands. He described the civil defence measures which could be taken after a nuclear exchange in Europe (which he, too, said could not be limited). He quoted a study from Boston (USA) in which it had been calculated that those few doctors who survived would take 14 working days of 20 hours each to see every casualty even for 10 minutes (and they would be assumed to be moving about in an area of fall-out contamination which would kill them also in a short time). He concluded that there was no possible effective medical response.

The Status of Nuclear Weapons in Europe

Professor Robert Neild, of the Faculty of Economics of Cambridge University, gave a paper in which he described the kind of nuclear weapons which were currently being deployed in Europe.

Human and Technical Factors Contributing to the Outbreak of Nuclear War

Dr L. J. Dumas, Associate Professor of Political Economy at the University of Texas/Dallas, gave a paper with considerable detail about why the outbreak of a nuclear war was becoming so likely. He gave four principal reasons why this is so:

1. The problem of accidents involving weapons of mass destruction.
2. The problems of controlling inventories of these weapons and preventing unauthorized use.
3. The large and growing gap between offensive and defensive capabilities.
4. The problem of accidental war.

All of these, he said, tend to decrease security, and all are exacerbated as the size and complexity of nuclear arsenals increases.

He identified three critical components of accidental nuclear war:

1. The occurrence of a triggering event.
2. The failure of rapid and reliable communications.
3. A background of high international tension.

Dr Dumas then went on to list the many human factors (such as drug addiction and alcoholism) which have been found in soldiers controlling nuclear weapons. It had been reported that alcoholism in Soviet soldiers is certainly 18 per cent, and possibly 30 per cent. In the years 1975, 1976 and 1977, roughly 5,000 soldiers each year were removed from access to nuclear weapons or responsibilities in the nuclear release process in the US army. The reasons were alcoholism (3-5 per cent), drug abuse (25-40 per cent) and other significant mental or character traits of aberrant behaviour (substantiated by competent medical authority) which are prejudicial to reliable performance.

Dr Dumas gave five reasons why the nuclear military environment is boring and socially isolating:

1. Boredom is itself stressful.
2. There are long periods away from family ties, and being 'on call'.
3. Secrecy further isolates from friends and family.
4. Being highly trained to carry a task through, but never being able to take it to completion, is frustrating and stressful.
5. The underlying awareness, no matter how conscientiously blocked and denied, that the next moment could result in the person becoming at least an accomplice in the largest scale mass murder in human history, is itself stressful.

Dr Dumas gave some of the effects of monotony on performance (established first by the RAF in studies of radio

operators during World War II) and said that boredom is dangerous because it dulls performance and because people will do nearly anything to escape from it when it is extreme.

Dr Dumas ended by saying that, 'We have created a world in which perfection is required if a disaster beyond history is to be permanently avoided. But in our world, the world of human beings, perfection is unachievable. The more weapons we deploy, the greater their geographic dispersion, the more people will be interacting with them and accordingly, the greater will be the likelihood of encountering a human error induced disaster'."

Reports from the Working Groups

For two days the Congress divided into groups to discuss a range of anticipated consequences of a nuclear war in Europe. Their reports were as follows:

Medical Problems in the Post-attack Situation (Days 4-60)

Early casualties after a European exchange of 1,000 1-megaton weapons, which is still only a fraction of the total nuclear weapons available, have been calculated as approximately 170 million dead and 150 million injured out of a total population of 670 million.

Effective triage, which requires highly trained personnel and availability of transport for treatment, would be virtually impossible. There would be approximately one physician left physically uninjured to 1,000 seriously injured patients after a 1,000 1-megaton nuclear attack in Europe. Those medical, nursing and paramedical staff who survived would be unable to work for several weeks because of fall-out radiation and the general disruption of facilities. Most central hospitals would be destroyed and those left would be unable to function because of the loss of essential services. Similarly, most stores of drugs and blood transfusion centres would be destroyed. Psychological trauma from the horror of scenes witnessed and the irreversible breakdown of the community would affect the survivors and seriously impair the capacity of surviving medical staff to help the injured.

We conclude that there could be no effective medical response in the event of a nuclear war involving Europe.

Long-term Problems of Survival

Nothing in this summary can or should be taken to imply any measure of reassurance or that there would necessarily be any realistic possibilities for re-establishing the provision of health care.

The main long-term problems would probably be:

1. Infection and communicable disease. The incidence and severity of these diseases would be exacerbated by the synergistic effects of low levels of immunity, lack of antibiotics, malnutrition, and other factors.
2. Haematological diseases including pancytopenia, multiple myeloma and leukaemia. The latter would probably occur at up to at least 10 times its normal incidence. Other non-communicable diseases would include severe physical handicap, some congenital deformities and malnutrition.
3. There would be an increased incidence of many solid tumours—for example, lung cancer.
4. There would be widespread psychological and psychiatric disturbances. These would, in some cases, lead to violence, often on a large scale.
5. Health care provision would initially be concerned mainly with infectious diseases, but less effort would be devoted to it than to the difficulties of obtaining food, drinkable water and shelter. Planning or attempting to identify priorities in the longer term is pointless.

Unquantified Effects on the Biosphere

The many simultaneous effects of a large exchange of nuclear weapons cannot be calculated with sufficient precision to rule out the occurrence of major changes in the biosphere that could endanger the human species. Among the effects already discovered (some of which have become known quite fortuitously), the possible depletion of the protective ozone layer in the upper atmosphere appears to be the most serious and at the same time the most difficult to quantify.

The injection of vast quantities of oxides of nitrogen into the lower stratosphere and the consequent depletion of ozone would permit dangerous levels of ultra-violet radiation (especially the so-called UV-B portion) to reach the earth. This radiation would kill or variously injure humans, animals, plants, and micro-organisms and could thereby severely unbalance or otherwise disrupt agricultural and natural ecosystems, both terrestrial and oceanic. The effects could be devastating.

In addition to the profound immediate and short-term effects of a large nuclear exchange, the best estimates now available indicate that the delayed global fall-out would in time cause several million fatal cancers and perhaps one-third that number of genetic defects amongst the survivors. With a large nuclear exchange, the climatic effects brought about by the vast amounts of dust injected into the lower stratosphere by the smoke and smog generated by the fires could severely disrupt agriculture on a worldwide basis and contribute to postwar conditions of famine. Ionizing radiation and wildfires would also destroy conifers and other natural vegetation, thereby leading to serious soil damage through erosion and loss of nutrients in solution. These and other factors would exacerbate famines and epidemics in both target and non-target countries, not least the underdeveloped countries, and could lead to even more fatalities than those brought about by the immediate energy releases.

The several long-term insults to the biosphere would be likely to act synergistically and lead to adverse and perhaps unknown effects far greater than a simple addition would suggest. If a total nuclear war were ever to occur, we cannot exclude the possibility that the many disruptive effects, both known and unknown, on the biosphere could lead ultimately to the extinction of the human species.

Great catastrophes of the past have had long-lasting psychological effects. A major nuclear war would be a vastly greater catastrophe than any previously recorded; moreover, it would be a catastrophe inflicted by mankind upon itself, by instruments it had itself devised. To the survivors, if any, the world of today, with all its horrors and atrocities, would appear in recollection like a lost paradise. The emotional attitudes of men and women in that blasted world are hard to imagine; they would surely range from agonizing grief to apathetic despair, with a haunting sense of terrible guilt at the thought that mankind had squandered and destroyed its inheritance.

The Arms Race and its Implications for World Health

The nuclear arms race increased the risk of nuclear world war, which is the ultimate threat to world health. World military expenditure is now about \$620,000 million per year and is likely to rise for the next few years at a rate unprecedented in peacetime. The costs of the arms race include employment of 40 per cent of the world's research scientists on military projects rather than on pressing social, economic, and health problems. The rapid increase in the military budgets of some Third World countries and the spread of nuclear capability are other major threats to world security.

A large proportion of the world's population, especially those living in developing countries, have serious, disabling, life-limiting diseases. Medical knowledge and technology

now exist which could prevent or cure many of these conditions; they fail to be applied not only because of a lack of political interest but also because of limited financial resources and trained personnel.

Indicators of current world health needs include average infant mortality rates eight times as high and life expectancies approximately half as long in developing countries as those found in developed countries. Daily food intakes in affluent countries average forty to fifty per cent higher than recommended requirements, while those for many of the people of Africa and the Far East average twenty per cent below recommended requirements. An estimated 800,000,000 people are malnourished and hungry and 50,000,000 die yearly from malnutrition. Over two thirds of the populations of underdeveloped countries have unsafe water supplies; water related diseases kill about ten million persons yearly.

The costs of many health-promoting programmes are modest compared to the costs of armaments. The provision of safe water for all would cost \$30,000 million dollars per year for a decade, adequate food \$4,000 to \$8,000 million per year, malaria control \$500 million per year and immunisation of children, three dollars per child.

There are insufficient resources to meet these health costs and to support the arms race. While it is a difficult, complex, and slow process to transfer resources from the arms race to social uses, it would be possible, given the political will. Amelioration of the world's major health problems would contribute to social and political stability, thereby decreasing the risk of nuclear world war.

Medical 'Planning' in Relation to Nuclear War

Medical planning for nuclear war raises a profound and unprecedented ethical issue for physicians. Our working group is unanimous in its opinion that no level of planning can produce acceptable reductions in mortality, morbidity and human anguish. Nevertheless, a responsibility rests with the medical profession to do everything possible to alleviate the suffering of survivors in their devastated environments. The working group therefore recommends that planning begin with vigorous efforts at prevention of nuclear war. It must be made clear that no plan can make nuclear war acceptable to the medical profession. Indeed, it is our belief that the result of planning will be to clarify the unacceptability of nuclear armament, thereby augmenting the general resolve to work for the prevention of nuclear war.

Looking to the possibility of nuclear war, many countries have proceeded without adequate consultation with the medical profession. The working group feels that this has resulted in unrealistic, often excessively optimistic projections. The need for secrecy has been invoked as the reason for exclusion of the profession. Since open communication is a tradition among medical professionals world-wide, the working group sees no justification for secrecy in medical planning.

Participation in planning a medical response to nuclear war is an issue of conscience and ethics among many physicians. They believe that medical preparation for nuclear war will increase its likelihood by strengthening the illusions of protection, survival and recovery. The working group believes that no physician should be compelled to participate.

Education about nuclear war should proceed jointly with the various health care professionals and public officials. It should address the entire spectrum of scenarios, from minimal to global, although limited nuclear war is very unlikely. The role of the physician in this process is to ensure that everyone has a complete understanding of the health consequences of a nuclear attack and the essential limitations of medical care in responding to these consequences. This involves an educational responsibility to practitioners, medical students and the general public. Medical schools should

be encouraged to sponsor instruction in the medical consequences of nuclear war and the logistic problems inherent in medical responses to unprecedented numbers of casualties. IPPNW should promote the production of resource materials for educational institutions and medical planners.

Such an educational effort will emphasise the primary need to prevent nuclear war. To consider the immediate post-attack period and the long-term consequences can have a preventive effect, particularly if it is done on the local level where the impact of nuclear bombardment can be made conceivable and personal.

Nuclear war will produce an incurable disease. We believe that prevention is the only acceptable course.

Civil Defence in Nuclear War

Civil defence concepts for a nuclear war were reviewed from a medical and psychological perspective and three basic approaches identified: evacuation, shelters in areas thought to be targeted, and shelters in areas where fall-out is presumed to be the primary problem. Our analysis disclosed that these concepts are based on a number of assumptions that do not withstand rigorous scrutiny. The assumptions include: adequate warning time, an error-free central authority, a knowledgeable and compliant population, a near-perfect transportation system, no retargeting, tolerable shelter conditions, functioning monitoring and communication systems, and psychological stability.

We concluded that the feasibility and effectiveness of civil defence measures in the face of all-out nuclear war are in serious doubt, even when evaluated in the context in which their advocates argue for them.

In addition, civil defence, when examined in the light of long-term effects can do nothing to mitigate: the spread of disease and epidemics; the pervasive radiation effects; the potential for widespread famine; the breakdown of individual will and co-operative effort; the destruction of health care, social, and economic systems; and devastation of the environment.

If these serious objections leave any hope of marginal effectiveness of civil defence, that slim hope must still be weighed against the negative consequences of planning and implementing such programmes. As physicians and scientists, we hold that exaggeration of the value of civil defence may delude the public into thinking that nuclear war is survivable and may encourage some governments to plan on that basis. The belief that a nation possessing nuclear weapons has an effective civil defence programme could be seen as provocative to its adversary and is consequently destabilizing. Efforts expended on civil defence direct resources away from necessary social programmes and may divert attention from the most important way of protecting people and enhancing national security—preventing nuclear war.

We conclude that there can be no effective civil defence against nuclear war.

Psychological Problems of Human Fallibility in Military-political Organizations

Although military and political organizations usually function reliably, serious human and technical errors have occurred. Because of the potential catastrophic effects of error, every effort should be made to identify sources of risk.

Official sources have tended to underestimate risk. Error may occur at any level in the organizational system. As physicians we would like to emphasize the medical and psychological factors contributing to failure.

With respect to individuals, we should mention boredom and isolation at lower eschelons and fatigue, stress, and illness at higher levels. Despite prior screening, the use of alcohol and drugs and occasional extreme anti-social behaviour and psychosis occurs among personnel with access to or

control of nuclear weapons.

In groups, over-cohesiveness and over-compliance tend to reduce rational behaviour in decision-making. High-level military-political group decision-making may be impaired by a reluctance of subordinates to question or challenge the majority or the leader of the group.

We recommend:

1. That the best solution to the problem of human fallibility in nuclear forces is to stop the production and reduce the arsenal of nuclear weapons because the fewer warheads the lower the probability of catastrophe.
2. Widespread education about the dangers of human fallibility in nuclear forces, particularly about the stresses that affect individuals and the processes which lead to unreliable group decisions.
3. More rigorous control of drug and alcohol use among nuclear personnel.
4. Removal of personnel from nuclear duty when any question of impaired individual functioning occurs and reduction of factors which contribute to such impairment.
5. Guidelines from the World Health Organization for health surveys and medical/social support for nuclear personnel.
6. That the environment for nuclear personnel must include the following elements to promote psychological stability and effective adaptation to the extraordinary responsibility they bear: an increased sense of personal, moral responsibility for their actions and access to education about the full implications of what they might do.

Denial and Stereotyping

Last year's proceedings looked at some of the psychological mechanisms that people use to protect themselves from confronting the horror of nuclear war—avoidance, denial and dehumanisation. This year the emphasis was on resistance, the process of change, and ways of overcoming resistance.

Resistance. When faced with the facts of nuclear weapons and war, there are at least four factors which prevent people from changing:

1. **Psychic numbing.** The scale of nuclear destruction is so vast as to be unimaginable. The facts are acknowledged, but their emotional accompaniment is not: this is protective in the short-term, in the long-term is maladaptive.
2. **Hopelessness.** Alternatively the anxiety created is so great that it causes hopelessness, apathy and despair.
3. **Stereotyping.** The enemy is seen in a distorted and degraded way. Each is a mirror image of the other.
4. **Illusions of deterrence.** Archaic thinking leads us to seek a sense of security through weapons that are unusable and endangering.

Change. There is a complex process involved when an individual becomes aware of post-nuclear reality. There are several aspects to this:

1. Facts may be looked at in a new way. A new perspective on the arms race may follow.

Mutual fascination and hatred between enemies create bonds of mutual dependence. In this sense the nuclear arms race may be seen as comparable to an addiction or perversion. It can then be realized that 'we' and 'the enemy' share a common danger and that therefore 'we' and 'they' should try to contribute to each other's security rather than seeking to undermine it. The real enemy has become nuclear weapons themselves.

2. This realization and the ensuing change of self-image may create initial feelings of cultural isolation from peers and colleagues.
3. Awareness of inconsistency leads on to a sense of absurdity. The misuse of language plays an important part in this, e.g. nuclear 'wars' cannot be 'fought' or 'won'.

4. Once a new frame of reference is reached, there may be an emotional release and a new sense of power and shared purpose. The moral force of medical opposition to nuclear weapons can be of great significance.

Activity is an antidote to the anxiety which a new frame of reference also creates. As the youth movement has shown, people need positive courses of action and protest.

Conclusion. Overcoming stereotyping was seen as a central focus both for research and East-West collaboration.

The Role of Physicians and their National Organizations in the Prevention of Nuclear War

Twelve national groups (in 10 countries) were represented. The working group believes that national campaigns should emphasize in their presentations the medical and psychological effects of nuclear war. Publications in the scientific and medical press and presentations to colleagues at all levels were endorsed, as were the world-wide production of a pamphlet for physicians' offices and appearance on local media programmes and the implementation of articles for the lay press. Speakers' training programmes should be developed. Activism should be encouraged as a means of alleviating despair, which may result from mere exposure to extremely frightening materials without the presentation of positive options.

IPPNW should support 'freeze' and other campaigns for disarmament and co-operate with other professional groups whose goals are the prevention of nuclear war. Officials at every level of government, especially health boards and city councils, should be informed of the medical consequences of nuclear war. Medical education programmes for graduates, undergraduates, and other health workers, such as nurses, are strongly encouraged, as is East-West exchange of medical students and physicians. Relationships with existing peace movements vary from cooperation to affiliation.

IPPNW is envisioned as a federation of, and resource for, national organisations. It is recommended that an international IPPNW faculty present symposia with live interactive satellite TV coverage on the medical consequences of nuclear war; that IPPNW co-ordinate specific studies; seek expert advisory status with the UN and WHO; encourage the adoption of resolutions on the prevention of nuclear war by medical societies, scientific unions, WMA and CIOMS; and that IPPNW seek a role as 'process facilitators' at international negotiating tables.

Further Reading (suggested in the pamphlet *Medical Consequences of Nuclear Weapons*: MCANW, 23a Tenison Avenue, Cambridge).

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