Why Chernobyl Still Matters

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Journalists and mathematicians have a way of focusing on one aspect of a complex situation in order to give a snapshot view of its magnitude. For example, one might read in the newspaper that a 'six alarm fire' had occurred in some neighbourhood. This immediately conjures up the image of a very large fire requiring six fire stations to send trucks to the scene. It gives one no clue as to the magnitude of loss of life or property, the water or smoke damage, the impact on human lives and health, ecological impact, and so on. Another example is that of a television show rating scale. If you see an estimate of five million viewers of some special event television, you immediately understand that this is a 'rounded number' meant for comparison only, which does not reveal how many people actually watched the show. Certainly some televisions played to an empty room and some to a large number of people watching the display in the local pub. It gives no indication of whether the watchers reacted positively or negatively to the programme. If the event is important, we expect professionals to fill in the details later.

Another misleading human custom is presenting an event as 'small' when there exist more traumatic forms of the event. For example, the radiation exposure to depleted uranium in the Gulf War is presented as 'small' in the face of a nuclear holocaust. Such exposure is not 'small' for the victims.

Unfortunately, many government officials, physicists, and engineers have used this tactic to deliberately minimise the health effects of radiation, and in particular the immense suffering after the 1986 Chernobyl disaster. For example, some people actually believe that the magnitude of a nuclear accident can be gauged by the potential number of cancer deaths it will cause, and further, that cancer death is the only consequence! Minimalist reporting occurred after the Three Mile Island accident, downwind of nuclear weapon testing, and at serious

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military accidents like the one which spread plutonium in farmland in Spain. Most recently it has attempted to deny that exposure to depleted uranium weapons has caused severe health damage to the military veterans and the civilians in Iraq, Kosovo and, most likely, in Afghanistan.

The minimalist reporting went even further with Chernobyl. The IAEA (International Atomic Energy Agency) and UNSCEAR (United Nations Scientific Committee on Atomic Radiation) recent statement that 'only 32 deaths occurred, 200 were heavily irradiated and 2000 avoidable thyroid cancers' resulted from the Chernobyl disaster goes well beyond a mathematical short hand which gives an immediate sketch about a disaster. This fifteen-years-later report about a complex, painful situation should be much more precise and believable! It rather tries to obliterate from people's minds and concerns the suffering of millions of persons in rural and un-evacuated areas who were exposed, and hundreds of thousands evacuated but not medically examined victims. When one probes a little more deeply, one finds that the honest scientists and physicians, trying to explain the widespread injuries and long term effects of nuclear exposure, have been silenced.

In fact immediately after the disaster of April 26, 1986, due to International Atomic Energy Agency policy, unless a person had been declared 'overexposed' at the medical tent set up for the 'liquidators' of the disaster, he or she was officially considered to be a 'radio-phobia' case, a purely psychological phenomenon. Local physicians told people that there would be no medical effects of exposure until, perhaps in ten or twenty years, they may happen to develop cancer. But, not to worry! These future radio-genic cancers would be indistinguishable from 'natural' cancers. The physicians soon learned from direct evidence of pathological injuries that this information from the physicists was less than candid. It was not surprising to learn that those who tried to minimise the disaster were the same people charged with promoting nuclear industries, for example, marketing nuclear reactors to the developing nations.

The experience of Chernobyl is not unique, but follows the secrecy pattern used at many lesser accidents which were mishandled in the same way. This has occurred both in the developed and developing world. In particular, I would note the radioactive pollution of the Mitsubishi Asian Rare Earth facility in Bukit Merah, Malaysia, the radioactive waste dumped in Nigeria, and the contaminated food distributed to Egypt, Papua New Guinea, India and other countries during the Chernobyl disaster clean-up.

However, the health problems due to Chernobyl continue to be very acute right now, and demand international attention and action. Scientists and physicians are deprived of their freedom, and the people, especially the children, are suffering. This crisis can serve to point out the serious secrecy, vested interest and collusion of international agencies protecting nuclear technologies. The public face of the nuclear industry has been 'clean and safe'. It is important to unmask this public face, serving as a warning to economically developing

countries deciding on energy technologies and bringing needed humanitarian aid to the victims. Preserving the false image of nuclear technology keeps the industry and nuclear agencies in business.

Lessons from Hiroshima and Nagasaki

Unlike the general study of toxic materials, handled by toxicologists, the field of radiation and health has been dominated by physicists, engineers and mathematicians since the dawn of the nuclear era in 1943. Their health related communications differ radically in content from similar communications of health professionals in Toxicology, Occupational or Public Health.

This field of radiation health was, with a few exceptions, taken over by the physicists of the Manhattan Project after World War Two, in their effort to contain the secrets of the nuclear age. Radiation was an effect of the atomic bomb. Secrecy caused these 'hard scientists' to fail to consider the broad range of responses and varieties of vulnerabilities possessed by a living population exposed to this hazard. Such variation in biological responses would have been expected by health professionals.

Because of Hiroshima and Nagasaki, most people now know about acute radiation exposure syndrome, with vomiting, hair falling out, alterations in blood cells, and so on, and this bit of information has been translated into a naïve belief on the part of the public, that unless acute radiation sickness has been documented (often by the government physicists) any subsequent severe illness observed in radiation exposed persons is due to something, anything, but not radiation exposure. This has some historical validity, but at Chernobyl with millions of exposed persons in rural un-evacuated areas, hundreds of thousands evacuated but not medically examined, and with the population's continuous ingestion of contaminated foods for the past fifteen years, demanding documentation of radiation sickness is ridiculous. Even in the Japanese cities radiation sickness went undocumented for many victims. Radiation injury is not predicated on documentation of acute radiation sickness, but rather on the alteration of a cell leading to a fatal cancer. It is well documented the these cellular level events can occur well below the level of exposure which causes overt sickness. The amount of energy released by just one nuclear transformation of one atom of a radioactive material is measured in thousands or millions of electron volts. It requires only 6 to 10 electron volts to break the molecular bounds in the cellular DNA and RNA which carry the genes for life.

In Hiroshima and Nagasaki (1945), exposure and subsequent health records were not complete. The research stations did not begin to select a study population until after the 1950 Japanese census identified survivors and a 1967 dose estimate was derived by the scientists at Oak Ridge National Laboratory in the United States. Deaths prior to 1950 were ignored. Death certificates, which were at times incomplete, were used to determine first cause of death of the study population. Cancers which were not fatal were not reported until 1994. Most survivors are still alive so their 'cause of death' has not yet been studied. Other

non-cancer health problems were considered to be 'not of concern' and have not been systematically reported.

There were persons who entered the contaminated territories of Hiroshima and Nagasaki after the fire died down, or who consumed radioactive contaminated food and water, who experienced radiation sickness, but were not officially recognised as 'exposed'. They are in the radiation exposure control group. This is easily explained to the mathematician, who is told that the Hiroshima and Nagasaki studies looked for the effects of the immediate penetrating radiation from the exploding bomb on the persons who were within three kilometres of the hypocentre at that moment. For the military person looking for information on the health effects of radiation due to the bomb, this artificial limitation made some sense. However, if a civil society is seeking information on the effects of man-made radiation on the human body, then all sources of that man-made radiation, including that from nuclear fall-out, food and water contamination, residual radioactive debris at the bomb site, and so on, is important. Changing the definition of 'exposed to man-made radiation' to mean 'exposed to the bomb', and then using this research to back public and occupational health policy is problematic to say the least!

Because of this concentration on the first flash of the atomic bomb, serious mistakes have been made by the radiation physicists in estimating the biological damage done by ingested or inhaled radioactive particles, many of which remain in the body for a long time and even enter into biochemical reactions of the cell's genetic material.

It is this atomic bomb study which appears to be dictating much of the inappropriate behaviour of officials with respect to the medical treatment of survivors of Chernobyl and other nuclear accidents. It has also caused harsh treatment of the honest scientists and physicians who spoke directly for the needs of the exposed suffering people. Many of these scientists and physicians, now in prison or effectively silenced, have conducted well designed and executed scientific studies.

Due to the complications generated by the study of external irradiation by a bomb being used to evaluate civilian exposures to inhaled or ingested radioactivity, and the use of this research to educate young physicists and nuclear engineers, many scientific blunders and administrative problems were generated. The failure to deal with the whole breadth of radiation problems became entrenched in the very agencies which were created in the 1950s to protect the public at risk from atmospheric nuclear testing. I will try to unravel the problems with the International Atomic Energy Agency (IAEA), the United Nations Scientific Committee on Atomic Radiation (UNSCEAR), the International Commission on Radiological Protection (ICRP), the US National Academy of Science Biological Effects of Ionising Radiation Committee (BEIR) and the World Health Organisation(WHO). All of these organisations, except the World Health Organisation, which was relegated to treating the victims rather than understanding the problem, play key parts with respect to current radiation and

public health policies and understandings. Ironically, the World Health Organisation, created by the United Nations in 1948, was not given any role in the health assessment of this global threat to human and ecological health.

United Nations Initiatives

Nuclear bombs were first used in war in 1945, when the United States used them against Japan in Hiroshima and Nagasaki. As early as 1946, the United States began atmospheric testing of nuclear bombs in the Marshall Islands, in the Pacific Ocean. The former Soviet Union demonstrated that it had the nuclear bomb in 1949, and there was tangible fear of a nuclear exchange during the Korean War. The United Kingdom began nuclear weapon testing off the coast of Australia in the 1950s, and then on the continent itself and in the Pacific Islands.

The first atomic bombs were based on fission, and because of this they were limited in their destructive power. The force of the explosion blew apart the fissioning materials, terminating the explosive energy release. In 1954, the United States tested a thermonuclear device (hydrogen bomb), called Bravo, at Bikini Atoll in the Marshall Islands, demonstrating that a nuclear device with unlimited power could be built. This one was about one thousand times more powerful than the Hiroshima bomb. It was this military accomplishment which prompted the 'Peaceful Atom' speech of President Dwight Eisenhower before the United Nations, also in 1954.

The speech followed a shift in United States Military Policy to dependence on nuclear bombs and a rush towards production of uranium and the technology necessary to carry this out through a major weapon replacement programme: uranium mining and milling, uranium processing facilities, nuclear fuel fabrication facilities, nuclear production reactors, reprocessing facilities and the hazardous transportation and waste associated with each of these industries. In order to obtain American and global co-operation during peace time, there was a perceived need for commercial or so called 'peaceful uses' of nuclear technologies which would justify everyone's co-operation in the nation and the international community. Nuclear electrical production was billed as capable of fulfilling all of the energy needs of the developing world, and being 'too cheap to meter'. It was promoted as the hope of preventing future wars since no country would be in need!

In 1955, the United Nations responded by creating the United Nations Scientific Committee on Atomic Radiation (Res 913(X) 1955) to 'assess and report levels and effects of exposure to ionising radiation'. According to the UNSCEAR web site, 'governments and organisations throughout the world rely on the Committee's estimates as the scientific basis for evaluating radiation risk, establishing radiation protection and safety standards, and regulating radiation exposure.' UNSCEAR was envisioned as an organisation of physicists, who at that time were the only ones who could measure radiation since it escapes our senses and requires specialised instruments for detection. They were the experts on the hazard of ionising radiation, but failed to have the expertise to predict the

varied human response to exposure to this hazard. In an odd way, perhaps because of their training in physics, they managed to average all exposures over the entire population of the world, now some six billion people. Natural background, because it is ubiquitous, rather homogeneously exposes everyone. However, a localised accident or relatively small workforce's exposure, when averaged over the whole population, can be made to seem trivial. It is not trivial to those who receive the exposure!

The United Nations Scientific Committee on Atomic Radiation became primarily a reporting agency, detailing the measurement of radioactive fallout, worker exposures and eventually emissions from nuclear power plants. I would assume that legislators saw this agency as providing independent monitoring of nuclear activities as a check on predicted pollution and theoretical estimates of harm. Unfortunately, UNSCEAR incorporated into its midst those same scientists who were making the predictions and estimating 'no harm from low level radiation'. No other industry is allowed to monitor itself. We do not ask the tobacco companies to tell us about tobacco's harm, or the pesticide companies to tell us the effects of their products on children. More on this point later.

In 1957, in response to Eisenhower's 'Peaceful Atom' speech, the United Nations also established the International Atomic Energy Agency, which describes itself as 'an independent intergovernmental, science and technology based organisation, in the United Nations family, that serves as the global focus point for nuclear co-operation.' Its mandate is described as: 'to promote peaceful uses of nuclear technology, develop safety standards, and verify that nuclear weapon technology did not spread horizontally to the non-nuclear Nations'. They had no mandate with respect to the nuclear weapons of the five nuclear states. Because of their nuclear watch-dog task, the International Atomic Energy Agency reports directly to the United Nations Security Council.

Response of the World Health Organisation

In 1957, the World Health Organisation, which was founded by the United Nations in 1948, became alarmed about the atmospheric nuclear testing and the proposed expansion of this technology for 'peaceful uses'. It called together eminent geneticists to consider the threat this exposure would pose to the human and ecological gene pool. Professor Hermann Muller, the geneticist who, in 1944, received a Nobel Prize for his work on genetic mutations of the fruit fly using ionising radiation, was a participant at this conference. Although the United States had not sent him as its delegate, he received a standing ovation at the conference for his work, and he consistently opposed the extension of nuclear technology into civilian uses. The conclusion of this expert group was that there was not enough information available in the scientific community to assure the integrity of future generations should the burden of ionising radiation exposure be increased. They called for extreme caution and further genetic investigations, especially in Kerala, India, where there is a high natural background level of radiation, and people have lived in this environment for hundreds of years. These

recommendations were never implemented by governments anxious to get on with nuclear activities.

Later, an independent non-governmental organisation in India studied genetic damage in the high radiation background area and found it indeed significantly increased. An Article by B.A.Bridges in *Radiation Research* (Vol 156, 631-641; 2001) suggests that genetic mutations due to radiation imply that 'the nature of the radiation dose response cannot be assumed'. There is more complexity than was expected in the health consequences of changed DNA sequences. The serious implications of nuclear pollution for future generations is still an area of research demanding more than ordinary caution.

One can guess at the politics behind a second World Health Organisation conference of psychiatrists, called later in 1957 to consider the Public Health impact of peaceful nuclear activities. These professionals concluded that such activities could cause undue stress to the population because of the association with the atomic bomb. One finds that this has become a mantra for the physicists who have subsequently controlled all information relative to the health impact of nuclear technologies. Most recently, when the United Nations Scientific Committee on Atomic Radiation released its 15 year assessment of the Chernobyl disaster, one of its spokespersons, Dr. Neil Wald, Professor of Occupational and Environmental Health at the University of Pittsburgh School of Public Health, stated: 'It is important that public misperceptions be reduced as much as possible in this area, because unwarranted perception and fear of harm can itself produce avoidable health problems, as well as erroneous societal benefit versus risk judgements.' Loosely translated, Dr. Wald appears to be saying: 'if the public gets upset we will not be able to make our money with this nuclear technology'.

After the Three Mile Island accident in 1979, in response to the people's demand for a health study, the government organised a study headed by a psychiatrist from the Annapolis Naval Academy. He drew concentric circles around the failed nuclear reactor and compared the cancer rates and also the levels of fear and tension of those living within these layers. A sensible study would have looked down wind for air borne radionuclide effects, and down stream for the water-borne effects. This official study found only fear, which was positively correlated with distance from the plant.

There were about 2000 injury cases from the Three Mile Island population taken to court for compensation of health damage due to the radiation exposure. The nuclear company fought all the way to the United States Supreme Court against the courts even hearing these cases, and lost. Then the industry found an old law stating that an expert witness must use the methodology used by other professionals in their field, and using this, the nuclear company managed to disqualify every expert witness (physicians, epidemiologists, botanists, biologists) brought in by the victims. The physicists and engineers claimed sole expertise in the area of radiation health effects. All cases were dismissed by the court without one being heard.

A Deal Between the World Health Organisation and the International Atomic Energy Agency

This potential conflict between those who wished to exploit the new nuclear technology for both profit and military power, and the custodians of the public health, was superficially resolved by an Agreement (Res. WHA 12-40, 28 May 1959) stating that the International Atomic Energy Agency and the World Health Organisation recognise that ...'the IAEA has the primary responsibility for encouraging, assisting and co-ordinating research on, and development and practical applications of atomic energy for peaceful uses throughout the world without prejudice to the right of the WHO to concern itself with promoting, developing, assisting and co-ordinating international health work, including research, in all its aspects.' If the reader is confused, so is the writer. To understand this, one needs to know that the health effects of radiation were classified as secret under the United States Atomic Energy Act for national security. The 'international health work' assigned to the World Health Organisation was taking care of the victims. While technically the International Atomic Energy Agency and the World Health Organisation are 'equal' in the United Nations family, those agencies which report directly to the Security Council, as does the Agency, have more status.

In Article I (3) of the WHO/IAEA agreement, it is stated that 'Whenever either organisation proposes to initiate a programme or activity on a subject in which the other organisation has or may have a substantial interest, the first party shall consult with the other with a view to adjusting the matter by mutual consent'. This clause seems to have weakened the World Health Organisation from investigating the Chernobyl disaster, and gave the International Atomic Energy Agency a green light to bring in physicists and medical radiologists to assess the damage relative to their limited knowledge of the health effects of radiation. (Note: while radiologists use ionising radiation in their work, they deal with health damage only after the patient receives therapy levels of radiation.) This first evaluation used a different epidemiological protocol in each geographical area and with different age groups, eliminated all concern for cancers as not having sufficient latency periods and failed to note the extraordinary epidemic of thyroid diseases and cancers. From the point of view of Medical Epidemiology they failed miserably to deal with the reality. The director of this 1991 Epidemiological study, Dr. Fred Mettler, is a Medical Radiologist. There were no Epidemiologists, Public Health professionals or Toxicologists on the International Atomic Energy Agency Team.

The Self-Established International Commission on Radiological Protection

The United Nations Scientific Committee on Atomic Radiation has continued to be the measurement agency, which verifies that all planned releases of ionising radiation to the environment, and all exposures of workers, are 'acceptable'. It fell to the International Atomic Energy Agency to 'establish or adopt, in

collaboration with other competent international bodies, standards of safety for the protection of health and to provide for the application of these standards'.

Neither the International Atomic Energy Agency nor the United Nations Scientific Committee on Atomic Radiation turned to the World Health Organisation to develop such protective health standards. Instead, they both turned to a self-appointed non-governmental organisation formed by the physicists of the Manhattan project together with the Medical Radiologists, who had organised themselves in 1928 to protect themselves and their colleagues from the severe consequences of exposure to medical X-ray. This new organisation, called the International Commission on Radiological Protection (ICRP), has a Main Committee of 13 persons who make all decisions. Members of this Main Committee were originally self-appointed, and have been perpetuated by being proposed by current members and accepted by the current executive committee. No outside agency can place a member on the International Commission on Radiological Protection, not even the World Health Organisation.

The United Nations Scientific Committee on Atomic Radiation 2000 Report was prepared by a Committee including the following seven persons who also serve on the thirteen person Main Committee of the International Commission on Radiological Protection: Prof. Roger Clark (currently the Chair of the International Commission), Prof. Rudolf M. Alexakhim, Dr. John D. Boice Jr., Prof. Fred A. Mettler Jr.(the same radiologist who headed the International Atomic Energy Agency Chernobyl epidemiological study), Dr. Zi Quiang Pan, and Dr. Yasuhito Sasaki.

It is the International Commission on Radiological Protection which makes recommendations for the protection of human health for workers and the general public. By their own admission, they are not a public or environmental health organisation. They have given themselves the task of recommending a trade-off of predictable health effects of exposure to radiation for the benefits of nuclear activities (including the production and testing of nuclear weapons). Their recommendations were first set in 1957, when the medical radiologists accepted the proposal which had been hammered out by the British, Canadian and American physicists after World War Two.

The original recommendation that workers be allowed 15 rad (150 mSv) per year was opposed by the British National Radiological Protection Board and an independent committee called the BEAR (Biological Effects of Atomic Radiation) funded in the United States by the Rockefeller Foundation. This forced the International Commission on Radiological Protection to reduce their recommendation for nuclear workers to 5 rad (50 mSv) per year. Maximum permissible doses for members of the public were ten times lower. This recommendation remained in effect until 1990, when under pressure from more than 700 scientists and physicians, and after a reassignment of doses at the atomic bomb research centres, the worker exposure was reduced to 2 rad (20 mSv) per year, while exposures to the public were reduced by another factor of five to 0.1 rad (1 mSv) per year.

Who Takes Responsibility?

It is important to note that no agency takes responsibility for these recommendations, and the World Health Organisation is excluded from professional collaboration or comment on them. The International Commission on Radiological Protection recommends, and the Nations are free to implement or not these recommendations. The Nations generally accept International Commission on Radiological Protection recommendations claiming that they do not have the expertise or money to derive their own standards. The recommendations are for a risk benefit trade off, and do not pretend to be based solely (or primarily) on protecting the public or worker health.

The International Atomic Energy Agency states: 'The underlying biological basis of the standards over the last several decades has rested primarily on the United Nations Scientific Committee on Atomic Radiation. This Committee was originally formed during the period of atmospheric weapon testing to assess the physical processes and health effects of fall out, but has since broadened its remit considerably'. UNSCEAR contains and depends on the leaders of the Main Committee of the International Commission on Radiological Protection. Those who set the standards also judge them to be adequate! Usually scientific theory is tested against reality and rejected if it fails to conform. Radiation health predictions are tested against the reality of the victims, and if reality fails to conform to theory, reality is rejected. The suffering is blamed on some unknown cause!

Another body that also assesses radiation risk is the BEIR Committee of the United States National Academy of Science. The BEIR (Biological Effects of Ionising Radiation) Committee was established in the United States around 1978 to counter accusations that the Nevada atmospheric nuclear tests had caused the deaths of thousands of American babies. BEIR is essentially a report and interpretation of the Hiroshima and Nagasaki studies of the effects of the atomic bomb, as previously discussed. These atomic bomb studies do not underpin the radiation standards, which actually were established some 17 years before the 1967 dose assessment for atomic bomb survivors, on which the atomic bomb studies are based, was completed.

The International Atomic Energy Agency radiation standards for nuclear waste were made 'on the basis of recommendations by a number of international bodies, principally the International Commission for Radiological Protection, and estimations of radiation risks made by the United Nations Scientific Committee on Atomic Radiation.' The International Atomic Energy Agency safety requirements for radioactive waste, including standards, codes of practice, regulations, and so on, 'may be adopted by Member States at their own discretion for use nationally'. These Agency requirements are mandatory *only* for the International Atomic Energy Agency itself.

What Happened to the People of Chernobyl?

One can easily imagine that there were civilian victims of radiation sickness in the midst of the chaos during and after the Chernobyl disaster who were never

seen at Hospital Six in Moscow. However, the International Atomic Energy Agency continues, even in 2002, to insist that only 32 persons died of radiation exposure at Chernobyl! These 'counted' deaths were all men from the fire fighting brigade identified as seriously exposed and sick by the heroic physicians and other health personnel at the emergency medical tent near the crippled reactor. This type of counting goes even further than the usual mathematical and journalistic approach – it deliberately and maliciously minimises the scale of this disaster and leaves the public vulnerable. Those who were exposed suffer without appropriate medical recognition and help, while those at a distance remain unprepared for another, perhaps worse, disaster.

Moreover, since the land contaminated by the failed reactor was poisoned, the fruits and vegetables grown on it, and the domestic animals who feed on it, and their milk and meat, are also contaminated. Russia, Ukraine and Belarus have taken this contaminated food and, with the advice of the International Atomic Energy Agency, have mixed it with uncontaminated food from other parts of the former Soviet Union. This diluted (or adulterated) food has been given to the people to eat, subjecting them to continuous low doses of internal contamination with radionuclides for the last fifteen years. In Belarus, people actually received money from the government for moving back onto the badly contaminated areas and setting up new farms.

The false claims of the International Atomic Energy Agency have also failed to rally the international community to help the victims of this disaster. People have not responded internationally, with their characteristic generosity, to the tremendous needs of the people whose health and lives were cruelly disrupted. The International Atomic Energy Agency and its companion body, the United Nations Scientific Committee on the Effects of Atomic Radiation, have gone even further in the Spring of 2002, by recommending that Chechen and Central Asian refugees re-populate the still contaminated area around the failed reactor. This raises some very serious questions about the mismanagement of information and communication around this serious disaster.

These two United Nations agencies, namely the International Atomic Energy Agency and the United Nations Scientific Committee on Atomic Radiation, and their partner the International Commission on Radiological Protection, have apparently supplanted the World Health Organisation in speaking to the health risks of this nuclear technology, and in particular, to the post-Chernobyl contamination of the people and the land. Whether or not this land is fit for habitation, or for food production requires health assessment, not a promotional OK from two agencies which have financial ties to the polluting industry!

The World Health Organisation tried to take some initiative on behalf of the suffering people, and in 1996 its Director-General, Dr. Hiroshi Nakajima, organised in Geneva an international conference with 700 scientific experts and physicians, many of whom came from Russia, Belarus and Ukraine. The International Atomic Energy Agency, which to its dismay was not invited to jointly sponsor this international conference, nevertheless blocked publication of

the proceedings. The physicians of Chernobyl then organised a conference in Kiev, Ukraine, in June 2001, and invited Dr. Nakajima (who was no longer Director-General of the World Health Organisation) to be their Honorary President. He was asked about the proceedings of the 1996 World Health Organisation Conference about the health of the Chernobyl victims which had never been published. He answered as follows: 'I was the Director-General and I was responsible. But it is mainly my legal department... Because the International Atomic Energy Agency reports directly to the Security Council of the United Nations...and we, all specialised organisations, report to the Economic and Social Development Council...the organisation which reports to the Security Council – not hierarchically, we are all equal – but for atomic affairs ... military use ... and peaceful or civil use ... they have the authority'.

Because of the internal United Nations structure, which is grossly out of date, the voice of the physicians and scientists actually dealing with the situation were not heard. It is outrageous to measure the radiation and then present a theory that no one has been hurt! It is imperative to look at the victims and assess their injury. Internationally, the theoretical voice of the International Commission on Radiological Protection, a non-governmental organisation, which speaks through the International Atomic Energy Agency and the United Nations Scientific Committee on Atomic Radiation, has prevailed. All three agencies have a vested interest in maintaining the reputation of nuclear industries as 'clean and cheap', even if they are not!

The representative of the United Nations Office for Humanitarian Affairs, D. Zupka, was present at the Kiev Conference, and he shared with participants the view of Kofi Annan, who estimated that the number of victims of Chernobyl is nine million. They are predicting that this number will increase. However, their voice is overpowered by the 'scientific' voice of the International Commission for Radiological Protection speaking through the International Atomic Energy Agency and the United Nations Scientific Committee on Atomic Radiation. This seems incredible, but is the heavy burden which we suffer as a legacy of the nuclear secrecy.

Because of the self-serving theoretical predictions and safety recommendations of the International Commission for Radiological Protection which colour the expectations of these radiologists, physicists and engineers, even when they are confronted with the reality of the suffering of the Chernobyl victims, these scientists strongly declare that the observed health problems could not be due to the radiation exposure. Health problems are instead assigned to an unidentified factor in the environment or life-style. Hans Blix, Director of the International Atomic Energy Agency at the time of the Chernobyl disaster, went so far as to say: 'The atomic industry can take catastrophes like Chernobyl every year'. There is an obvious conflict of interest for this agency mandated to promote nuclear technologies!

At the Kiev Conference, Alexey Yablokov, President of the Centre for Political Ecology of the Russian Federation, pointed out that the data used by the

United Nations Scientific Committee on Atomic Radiation had been falsified by the State Committee for Statistics, and the officials were arrested in 1999 for this crime. He charged that the United Nations Scientific Committee on Atomic Radiation continued to use this falsified data to support its minimisation of harm.

The medical research of Prof. Y Bandazhevsky, a medical pathologist, Rector of the Medical Institute of Gomel, in Belarus, had to be presented by a colleague, Prof. Michel Fernex. Prof. Bandazhevsky was under house arrest. Belarus received the heaviest fall out from the Chernobyl disaster. After nine years of research in Chernobyl-contaminated territories, he had discovered that caesium 137 incorporated in food, leads to destruction of those vital organs where the caesium 137 concentrates at higher than average body levels. With his wife, a paediatric cardiologist, Bandazhevsky described what he called 'caesium cardiomyopathy', and which others say is a syndrome which will eventually be named after him. The cardiac damage becomes irreversible at a certain level and duration of the caesium intoxication. Sudden death may occur at any age, even in children. After publishing this finding, denouncing government non-intervention policy, and arguing against the lack of resources given to the medical investigation of the disaster, Bandazhevsky was arrested, tried and condemned to prison for eight years.

The trial of Prof. Bandazhevsky was observed by lawyers from the Organisation for Security and Co-operation in Europe (OSCE), from the French Embassy in Minsk, and from Amnesty International. These observers documented irregularities and legal errors from the time of his arrest. In the middle of the night of July 13,1999, Prof. Bandazhevsky was arrested by a group of police officers, who informed him that the arrest was by presidential decree aimed at fighting terrorism. This was never charged in court. In fact, it was not until four weeks after his arrest, August 1999, that he was finally charged with taking bribes. These proved to be trumped up charges by two defendants who later recanted their testimony saying it was forced under duress and threats. Prof. Bandazhevsky was denied access to a lawyer for the entire duration of his detention, and during the trial there were serious breaches of Belarussian and international law. Amnesty International has listed Prof. Bandazhevsky as a prisoner of conscience. He is not well, and his important research is being kept from his scientific and medical colleagues.

Professor Bandazhevsky is not alone. The Russian, Belarussian, and Ukrainian medical community, though silenced in international circles, was still present and active in alleviating the suffering and noting the causes of their people's pain. Many have carried out detailed high quality scientific studies on the genetic, teratogenic and somatic damage done by radiation exposure. They have confirmed their analyses by demonstrating the effects in animal experiments. The rest of the world is being deprived of this research through heavy handed silencing of the scientists by their national authorities, acting on the recommendations of the International Atomic Energy Agency and the United

Nations Scientific Committee on Atomic Radiation, and especially the International Commission on Radiological Protection.

Recommendations

While many individuals have been trying to make known this major United Nations problem, it has been difficult to get this complex situation across to the public in 'sound bites'. Serious study on the part of the United Nations will be needed to undo all of the damage caused. However, it seems possible to make the following recommendations to the United Nations:

- The World Health Organisation should be mandated to review all radiation research and to recommend health-based safety regulations. This mandate should be carried out by health professionals, including epidemiologists, oncologists, occupational and public health specialists, geneticists and paediatricians, (not linked with the nuclear industries or nuclear medicine), rather than other scientists.
- The International Atomic Energy Agency mandate to promote 'peaceful nuclear technologies' should be withdrawn.
- The International Atomic Energy Agency mandate to safeguard the spread of nuclear weapons should be expanded to include monitoring the reduction and abolition of all nuclear weapons in the nuclear nations.
- The United Nations Scientific Committee on Atomic Radiation (UNSCEAR) mandate needs to include the monitoring of increasing levels of background radiation and nuclear emissions from reactors and nuclear accidents. They should not be entrusted with estimating risk, which is the prerogative of the World Health Organisation.
- Decisions relative to the safety of farmland, food and water ingestion and refugee relocation should be entrusted to the World Health Organisation.
- Investigation into the imprisonment of scientists and physicians who have spoken out on behalf of the public health relative to radiation exposure should be undertaken by a special rapporteur of the Human Rights Commission in Geneva.

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