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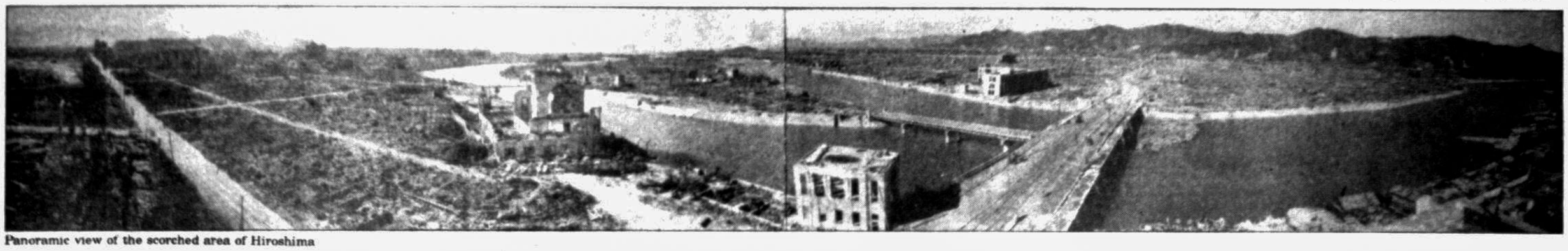


Panoramic view of the scorched area of Hiroshima

HIROSHIMA : THIS MUST NEVER HAPPEN AGAIN

by Md. Abdul Matin

Panormic view of the scorched area of Nagasaki

ON August 6, 1945, it was a clear and warm morning in Hiroshima. The last air-raid alarm was issued at 7:09 a and eventually cleared within next 22 minutes. People were engaged in their usual start of the day. But at 8:15 am one US B-29 bomber named 'Enola Gay' noiselessly flew over the city from northeast dropping the Atomic bomb. Forty three seconds later the bomb exploded in the air, about 600 metres above the ground. 'Enola Gay' was accompanied by two other B-29's; one dropped a measuring and communication apparatus with a parachute tied to it and the other took photograph of the spreading bomb cloud.

The bomb was named 'Little Boy' — three metres long with a diameter of 0.7 metres weighing 4 tons. It contained uranium 235 with energy equivalent to 15 kilo tons of TNT and 20 trillion calories.

The explosion released intense heat rays, blast and radiations which made Hiroshima collapse into ruins. It is estimated that 350 thousand people were exposed, about 100 thousand of them died instantly and another 100 thousand afterwards - till today. Number of houses destroyed was 10,000, burnt 57,000 and the total area affected 30.3 square kilometres — about 42% of the total Hiroshima city.

Three days later another nuclear devastation ruined the city of Nagasaki leaving 74,000 people dead and another 75,000 severely injured. Even now, 47 years later, more than 300 thousand *hibakushas* i.e. the survivor victims of exposure to residual radiation are still suffering from the after effects of both the explosions.

Our understanding of the potential human devastation of a single nuclear explosion is rooted in the terrible experience of Japanese citizens in Hiroshima and Nagasaki. But the weapons used in 1945 were really tiny in comparison to most of the 40 to 50 thousand nuclear Weapons of the present day which do have the total exposure power equivalent to one million Hiroshima bombs. According to simple calculations the equivalent of more than one million Hiroshima bombs could kill 200,000,000, 000 people i.e. about 50 times the total present global population !

Though enormous improvement of East-West relations has sharply reduced the risk of nuclear war, we cannot ignore the fact that enough nuclear weaponry to annihilate the human race is still stored or deployed around the world. Any regional conflict (like Gulf crisis) or conventional war may be dragged into a state of nuclear threat. Moreover, the risk of mishandling nuclear weapons and the subsequent accidental blast is not based on absolute imagination. We may look into the history of accidental nuclear detonation — apart from numerous unknown or concealed incidences in production plants — more than 30 aircraft, 58 submarines and two satellites involved nuclear accidents are so far known to the world and obviously Chernobyl disaster needs no new public presentation. Nuclear accidents are known to be started from the dropping of one weapon in Puget Sound from a B-36 bomber on February 13, 1950 and the last being on April 7, 1989 when a Soviet submarine caught fire and sunk near Norway coast resulting in the death of 42 crew members.

Therefore, accidental nuclear explosion too deserves much attention at this moment. Before we go into the elaboration, at least medical effects or health consequences of a nuclear blast needs to be considered to understand the unfortunate severity of such accidents.

MEDICAL CONSEQUENCES OF NUCLEAR EXPLOSION

Let us consider a single explosion of a one megaton nuclear warhead having he potentiality equivalent to one million tons of TNT (i.e. only 60 times more than Hiroshima bomb), detonated on the ground, in a city or a town. Such a detonation will have - (a) Immediate and (b) late effects over the area, as detailed below:

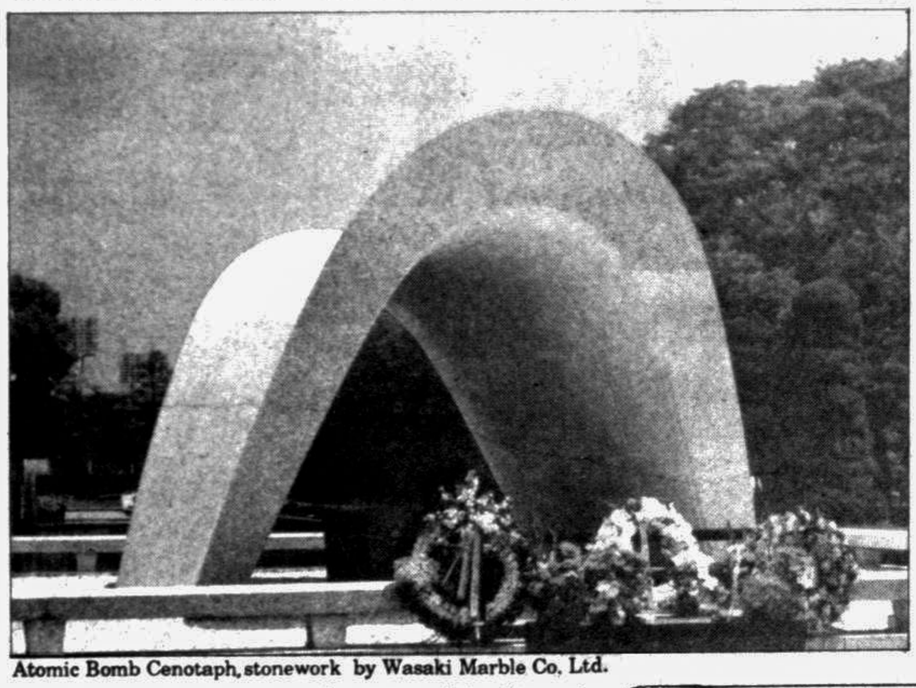
(a) IMMEDIATE HUMAN CASUALTIES stem from three different sources of injuries: The blast effects of explosion itself, the burns resulting both from direct exposure to intense heat and subsequent massive fire and the radiation released, delivered in the form of radio active fall out down wind. The summary below describes the nature of the destruction and injuries in accordance with the variation of distances from the point of explosion, i .e. Ground Zero.

(1) At Ground Zero: The explosion creates a crater 92 meters deep and 367 meters in diameter. All lives and structures are obliterated. (2) Within 0-1.5 km radius: Within one second the atmosphere ignites into a fire ball more than one km in diameter with core temperature three times more than that of the sun-surface (i.e. 6000 Degree Celsius). The fire ball rises to a height of six miles or more. All life below is extinguished in seconds. (3) Within 1.5 -5 km radius: A blast wave of flash and heat radiates outward causing instantaneous burns within 12 seconds. All factories and commercial buildings collapse and small frame and brick residence are destroyed by the fire-wind of 290 miles per hour. At least 50% of the population dies immediately. (4) Within 5-10 km radius: The fire strum consumes all nearby oxygen, burning continues, small buildings destroyed. Asphyxia kills more people, shelters become oven. Fire storm accelerates with the addition of combustible articles like wood, oils etc. (5) Within 10-20 km radius: Shock wave reaches and sweeps over the distance in 40 seconds, causing second-degree burns. Total early casualties (killed or injured) may rise from 5% to 50%.

(b) LATE EFFECTS:

(1) **Radiation casualties:** Radiation exposures have little significance in the immediate proximity of the explosion, rather all the casualties are due to rapidly fatal burns and blast injuries. However, the survivors will have immediate radiation of high lethal doses directly from the blast and late or mid-term effects from radio active fall out from the nuclear cloud created earlier. All foods, drinks, land and plants will have radio active elements initiating long term exposure for all life in the society .Winds will play vital role in driving the radio active 'Death Ash' away from the area of the explosion even beyond the territory, causing multi-state spread and contamina-

Atomic Bomb Dome, memorial in Hiroshima



Atomic Bomb Cenotaph, stonework by Wasaki Marble Co. Ltd.

tions. We remember that the Chernobyl nuclear disaster in former USSR led to the spread of nuclear soot over vast areas of Scandinavian countries and other adjacent areas of Europe, including North Wales and Lape Land in United Kingdom.

The most important medical problems resulting from acute radiation exposure include central nervous system dysfunctions, nausea, vomiting, diarrhoea, dehydration, nutritional problems, destruction of body's capability to produce new blood cells resulting in uncontrolled bleeding and life threatening infections and death. Late problems of radiation include baldness of head, decline in healing process; keloids; cancers in blood, breast, lung, thyroid gland and skin; cataract in eyes, microcephatia or delayed growth in babies who received exposure in utero (womb), etc.

(2) **Distortion of medical care:** The aftermath of a nuclear explosion needs more attention to be paid at. Explosion itself will have destroyed all hospitals and other medical facilities, killed or injured most of the medical and paramedical personnel, and destroyed all transport and communications arrangements. That means, the effective use of the scarce medical resources that are available simply won't be realistic.

An understanding of the massive levels of death and irremediable sufferings that would result from an explosion of a single warhead compels a simple conclusion: No such explosion must ever happen - whether by accident, through a terrorist or in war.

PREVENTION OF ACCIDENTAL NUCLEAR EXPLOSION

Prior to the Chernobyl nuclear disaster, expert nuclear scientists estimated that probability of an accident at that factlity was less than one chance in 10,000 years - but still it happened.

The risk of accident depends on the design and deployment, characteristics of the command and control system, selection and training of the personnel handling the weapons, number of nuclear weapon states and political relations between and situations within them.

It is assumed that the nuclear powers are much concerned and careful about any sort of mishandling or inadvertent situations in their nuclear establishments. But the Chernobyl and other experiences make it obligatory to review the existing measures and situations to reduce the risk of any accidental explosion in nuclear setups. These are:

(1) Nuclear war heads are designed to minimize the chance of accidental explosion when exposed to any mechanical damage, heat or radiation. But not all of them meet the modern safety standards even in USA and Russia.

(2) Warheads are usually well-protected when deployed, stored, transported or maintained to preclude sabotage, theft or loss. But in areas having civil strife, unauthorized possession can't be overruled.

(3) Electronic locks and command and control system are designed to prevent unauthorized use, so that the final decision to use them is left to the hands of the highest political or military leaderships. But tactical weapons are said to be under less strict command than the strategic ones.

(4) Large number of personnel engaged in operational management are selected or screened carefully before their employment. But their work may create a dangerous combination of boredom and stress. Many of them are reported to have experienced emotional, alcohol or other drug problems in last days, even some of them were terminated from the job.

(5) High alert level is still maintained for some of the nuclear forces which in turn may induce accidental use of the weaponry.

(6) Naval nuclear weapons are said to be devoid of most advanced electronic locks.

(7) Complexity in command control system is ever increasing, creating chances of hardware failure and software fault.

(8) More states have nuclear weapons or have the capacity to make them any time.

(9) New and emerging nuclear weapon states probably have less effective command and control system.

(10) Political stability in some nuclear weapon states is some times in doubt (e.g. CIS states).

(11) In some of the emerging states, there is a lower level of awareness of and knowledge about the consequence of nuclear explosion. This is especially true in India and Pakistan.

(12) As a consequence of civil conflict in any nuclear weapon state, the weapon could fall into the hands of insurgents or terrorists, could be used for blackmail or as a demonstration of power or could be occupied by other countries.

Necessary caution and steps need to be adopted to mitigate the above mentioned problems and it is an utmost necessity to ensure highest safety device and effective measures to minimize the risks of accidental nuclear explosions.

Evidently, the only way to eliminate the risk altogether is to abolish all the nuclear weapons and certainly this long cherished desire of the humanity must be attained one day to save this planet. The former US President Dwight D. Eisenhower said "Every gun that is made, every warship launched, every rocket fired signifies in the final sense, a theft from those who hunger and are not fed, those who are cold and not clothed. This world in arms is not spending money alone. It is spending the sweat of its labourers, the genius of its scientists and the hopes of its children."

Now mankind is confronted with a choice - the arms race or the race for human development. Harrowing memory of Hiroshima helps us to decide.

Dr. Md. Abdul Matin is ex-Deputy Councillor, International Physicians for Prevention of Nuclear War (IPPNW).

Published on the occasion of 'Hiroshima Day' that passed yesterday

"I am Alive"

by Hajime Watanabe

Born in 1930. Exposed when a third-year student in middle school at age 14 while he was mobilized in work to produce ignition devices in a factory at Funairi Kawaguchi-cho, 2.1 km from the hypocenter. In 1985 he started medical practice in Naka-machi and former vice-president of Hiroshima City Medical Association.

On August 6, 1945, at 8:15 in the morning, when I was 14 years old and, in my third year of middle school, the A-bomb was dropped for the first time in the world. The war had been in the last stage, and goods, food and especially the work force were in short supply in Japan. Even students 14 or 15 years old had to be mobilized for work. We were drafted to help with the production of weapons. There were no classes at school at all. We worked hard to make ignition devices in a munitions factory in Funairi Kawaguchi-cho with the belief forced upon us of eventual victory.

There was a sudden flash, boom and then complete darkness. I, had been standing in front of one of the machines in the factory which was 2.1 km away from the hypocenter. I dove beneath a lathe in terror, cowered, my body rigid, and held my breathe. Something was falling from the ceiling. I could hear someone groaning. I was suffocating with fear. I thought I would die there. My parents' face came to mind and instinctively I wanted to live. I was a just 14 year old boy. We were taught that it is an honor for Japanese men to die for the Emperor and Japan, but my personal instinct in this extraordinary situation was that "I want to be alive, I do not want to die."

Fortunately, the factory escaped collapse or fire and, I did not get burned nor hurt seriously. I just had some bruises. It gradually became light little by little and, I looked around. It was good to feel alive. As a child 14 years old, I took a deep breath, crawled out from under the machine, and rushed to the exit. I could move. I could breathe. Tears rolled down my cheeks. "I did not die, I am alive. I must get outside, anyway" I thought. The scene outside surprised me. I saw crumbled walls and buildings were leaning. All window glasses were blown away. My friends, who unluckily had been outside, were burned and bleeding because of the heat rays or flying debris. We held hands, hugged each other in happiness with our mutual survival. Soon, it began to rain heavily. Black rain fell from a dark sky. My smudgy white shirt was stained with black spots. I felt an unearthly premonition. We went to the municipal high school (present Funairi High School), which had been designated as a refuge area, to find the roof burning. We worked together to put out the fire passing buckets from one person to another.

A few days later, even slight injuries suppurated and my hair began to fall out. I couldn't leave my bed because of a high temperature. In spite of those symptoms, I have survived till now.

Rumors spread that in Hiroshima no grass nor trees would grow for the next 75 years. I believe that it is the duty of survivors is to demand the total ban of the nuclear weapons, to continue to speak out about our unforgettable experiences and to work to keep a peaceful world.

We shall not repeat the evil.

Extract from Journal of Hiroshima City Medical Association.

When Hiroshima is Spoken of

by Sadako Kurihara

When Hiroshima is spoken of,
Will she ever be able to welcome in return
Gentle words as, "Ah, Hiroshima"?
When Hiroshima is spoken of,
"Pearl Harbour" is heard in reply,
"Nangkin slaughter" yet another reply.

When "Hiroshima" is spoken of,
Others speak out with, "burning to death in Manila" —
Where women and children were confined in trenches,
Sprinkled with gasoline,
And set aflame as living torches.
When "Hiroshima" is spoken of,
Blood and flame echo back, in reply.

When "Hiroshima" is spoken of,
No gentle reply may be heard
As "Ah, Hiroshima".
The dead and innocent people of Asian countries
As the violated ones
Express their anger all at once
When "Hiroshima" is spoken of
And a gentle reply is expected,
As "Ah, Hiroshima,"
Can arms not be discarded,
And garrison bases removed ?
Until such a day, Hiroshima remains
The bitter city of cruelty and insincerity.
We are the pariahs scorched by latent radiation.

When "Hiroshima" is spoken of,
And a gentle reply is expected,
As "Ah, Hiroshima".....
Let us make clean
Our hands
by ourselves.

Translated by Miyao Ohara