

Below I've made a copy of the text of "The Effects of Nuclear Weapons" in order to comment on a point by point basis but first I need to establish my credentials – so to speak. In 1949 I was among a group of 8 service people (2 Air force, 2 Navy, 2 Army and 2 Marine) chosen to work as civilian scientists with a newly formed Weapons Effects Test Team. I was a Navy Electronics Technician working as an electronic engineer/scientist.

We worked initially at Sandia Labs in Albuquerque and later at Eniwetok and the Nevada Proving Grounds. Our job was to instrument pressure, strain, acceleration and displacement on structures involved in nuclear explosions. As a result we regularly observed nuclear explosions from a distance of 15 miles. In one instance our tests involved Army troops in slit trenches ½ mile from ground zero. None of those troops have ever suffered ill effects from the blast and I am, at 72, "healthy as a horse" according to the doctor who recently gave me a complete physical.

Now let's establish some solid facts.

There are two measurable radiation constituents in a nuclear detonation – gamma radiation and spectral energy in the form of heat and light over a broad spectrum. Both peak at the exact time of detonation (traveling at the speed of light) and die out within milliseconds. The gamma component (x-rays to the layman) probably don't exceed the levels you would get in a doctor's office x-ray. No one – despite the tabloid coverage to the contrary – has EVER died as a result of exposure to the gamma pulse of a nuclear weapon! The injuries so notoriously depicted of the victims at Nagasaki and Hiroshima were the result of BURNS! Fire storms occur because of combustible material (paper and wood houses in Japan) and the winds generated by the blast.

The fallout component consists of vaporized steel and other material which may, in some instances, emit alpha and beta particles. These radiation particles cannot penetrate skin but they can cause minor damage if the particle generating material is ingested or breathed. Their heavy nature, however, means that they rather rapidly become sedimentary and no longer pose a real health risk.

As to EMP – just like the other radiation components – it is extremely short lived. Since it is electromagnetic in nature, it can generate voltages in any conductor. It does, however, emanate from a point source and decreases rapidly with distance based on the same square laws that cause light levels emanating from a point source to fall off rapidly with distance.

When I was in high school I had this vision of a world without borders and a common language. I expected that by the time I was older this Utopia might happen. Problem is, even WITH a common language we still have problems communicating. In any event I hate war and the results of war so I would love to see the world disarm. The fact is that's not likely to happen in my lifetime but I seriously doubt that a nuclear war will ever happen. Enough of our infrastructure would be destroyed to kill good arms deals and we'd lose money... Just think how much money the arms manufacturers are going to make replacing the ordnance used in Serbia.

The Effects of Nuclear Weapons
By Russell D. Hoffman

A year ago this month, India surprised the CIA -- and nearly everyone else except, perhaps, Pakistan, who seems to have been nearly ready -- by setting off several underground nuclear explosions. Then Pakistan, claiming self-defense, followed suit. But what would actually happen if India and Pakistan had a nuclear exchange?

Most people in India and in Pakistan (and in the U.S.) probably do not know that as many as 9 out of 10 people -- or more -- who die from a nuclear blast, do not die in the explosion itself. They may die from starvation, disease or other causes but if they DO die as a direct result of the blast it WILL be by burning to death. Gamma radiation from the blast will not kill them if the heat doesn't.

Most people probably think that if they die from a nuclear blast, they will simply see a flash and get quickly cooked.

That is exactly what will happen if they are close enough!

Those within approximately a six square mile area (for a 1 megaton blast) will indeed be close enough to "ground zero" to be killed by the gamma rays emitting from the blast itself. Ghostly shadows of these people will be formed on any concrete or stone that lies behind them, and they will be no more. They literally won't know what hit them, since they will be vaporized before the electrical signals from their sense organs can reach their brains.

Sorry -- those directly exposed and close enough would be burned to death. Those far enough away or sheltered from the heat would NEVER suffer ill effects from the gamma radiation.

Of the many victims of a nuclear war, these are the luckiest ones, of course.

Outside the circle where people will be instantly vaporized from the initial gamma radiation blast, the light from the explosion (which is many times hotter than the sun) is so bright that it will immediately and permanently blind every living thing, including farm animals (including cows, sacred or otherwise), pets, birds while in flight and not to mention peasants, Maharajah's, and Government officials -- and soldiers, of course. Whether their eyes are opened or closed. This will happen for perhaps 10 miles around in every direction (for a 1 megaton bomb) -- further for those who happen to be looking towards the blast at the moment of detonation. Even from fifty miles away, a 1 megaton blast will be many times brighter than the noonday sun. Those looking directly at the blast will have a large spot permanently burned into their retinas, where the light receptor cells will have been destroyed.

The huge bright cloud being nearly instantly formed in front of them (made in part from those closer to the blast, who have already "become death"), will be the last clear image these people will see.

Yes -- looking directly at the blast can cause temporary to permanent blindness.

Most people who will die from the nuclear explosion will not die in the initial gamma ray burst, nor in the multi-spectral heat blast (mostly X-ray and ultraviolet wavelengths) which will come about a tenth of a second after the gamma burst. Nor will the pressure wave which follows over the next few seconds do most of them in, though it will cause bleeding from every orifice. Nor even will most people be killed by the momentary high winds which accompany the pressure wave. These winds will reach velocities of hundreds of miles an hour near the epicenter of the blast, and will

reach velocities of 70 miles per hour as far as 6 miles from the blast (for a 1 megaton bomb). The high winds and flying debris will cause shrapnel-type wounds and blunt-trauma injuries.

Both radiation constituents travel at the speed of light and if you are not killed by the heat you will not suffer any other radiation related problems.

Together, the pressure wave and the accompanying winds will do in quite a few, and damage most of the rest of the people (and animals, and structures) in a huge circle -- perhaps hundreds of square miles in area.

Actually total damage occurs in an area 3 miles in diameter. From that point out damage reduces rapidly.

Later, these people will begin to suffer from vomiting, skin rashes, and an intense unquenchable thirst as their hair falls out in clumps. Their skin will begin to peel off. This is because the internal molecular structure of the living cells within their bodies is breaking down, a result of the disruptive effects of the high radiation dose they received. All the animals will be similarly suffering. Since they have already received the dose, these effects will show up even if the people are immediately evacuated from the area -- hardly likely, since everything around will be destroyed and the country would be at war.

Totally tabloid and false to fact!

But this will not concern them at this time: Their immediate threat after the gamma blast, heat blast, pressure wave and sudden fierce wind (first going in the direction of the pressure wave -- outwardly from the blast -- then a moment later, a somewhat weaker wind in the opposite direction), will be the firestorm which will quickly follow, with its intense heat and hurricane-force winds, all driving towards the center where the radioactive mushroom-shaped cloud will be rising, feeding it, enlarging it, and pushing it miles up into the sky.

See earlier -- fire storms result when violently combustible material is within the high temperature range of the particular weapon.

The cloud from a 1 megaton blast will reach nearly 10 miles across and equally high. Soon after forming, it will turn white because of water condensation around it and within it. In an hour or so, it will have largely dissipated, which means that its cargo of death can no longer be tracked visually. People will need to be evacuated from under the fallout, but they will have a hard time knowing where to go. Only for the first day or so will visible pieces of fallout appear on the ground, such as marble-sized chunks of radioactive debris and flea-sized dots of blackened particles. After that the descending debris from the radioactive cloud will become invisible and harder to track; the fallout will only be detectible with geiger counters carried by people in "moon suits". But all the moon suits will already be in use in the known affected area. Probably, no one will be tracking the cloud.

One U.S. test in the South Pacific resulted in a cigar-shaped contamination area 340 miles long and up to 60 miles wide. It spread 20 miles *upwind* from the test site, and 320 miles downwind. Where exactly it goes all depends on the winds and the rains at the time. It is difficult to predict where the cloud will travel before it happens, and it is likewise difficult to track the cloud as it moves and dissipates around the globe. While underground testing is bad enough for the environment, a single large above-ground explosion is likely to result in measurable global

increases of a whole spectrum of health effects. India or Pakistan will deny culpability for these deaths, of course. The responsible nations, including my own, always do.
Mostly over exaggerated hype.

But the people who were affected by the blast itself will not be worrying about the fallout just yet.

A 1 megaton nuclear bomb creates a firestorm that can cover 100 square miles. A 20 megaton blast's firestorm can cover nearly 2500 square miles. Hiroshima and Nagasaki were small cities, and by today's standards the bombs dropped on them were small bombs.

Absolutely the most ludicrous statement I've ever heard! If a 20 megaton weapon were dropped on San Diego I would likely be fine here in Oceanside as far as immediate damage and health are concerned. Obviously we would have the problems of obtaining food and our water supply might not be drinkable but health wise we'd mostly be fine.

The balance of this article? is hardly worth commenting on it is so wildly false to fact. I would happily listen to any refutation of this view based on some authoritative response that says what you are saying is true. It is really too bad that folks like yourself, Robert, can safely write trash like this with little fear that the majority of the population will be able to separate fact from fiction. It has always been my view as a writer that I owe my readers the courtesy of doing due diligence in research before I jump in and start making an ass of myself.

The Allied firebombing of nearly 150 cities during World War Two in Germany and Japan seldom destroyed more than 25 square miles at a time, and each of those raids required upwards of 400 planes, and thousands of crewmembers going into harm's way. It was not done lightly. And, they did not leave a lingering legacy of lethal radioactive contamination.

In the span of a lunch hour, one multi-warhead nuclear missile can destroy more cities than all the incendiary raids in history, and the only thing the combatant needs to do to carry off such a horror is to sit in air-conditioned comfort hundreds or even thousands of miles away, and push a button. He would barely have to interrupt his lunch. With automation, he wouldn't even have to do that! The perpetrator of this crime against humanity may never have seen his adversary. He only needs to be good at following the simplest of orders. A robot could do it. One would think, that ONLY a robot WOULD do it.

Nuclear war is never anything less than genocide.

The developing firestorm is what the survivors of the initial blast will be worrying about -- if they can think straight at all. Many will have become instantly "shell-shocked" -- incapacitated and unable to proceed. Many will simply go mad. Perhaps they are among the "lucky" ones, as well.

The firestorm produces hurricane-force winds in a matter of minutes. The fire burns so hot that the asphalt in the streets begins to melt and then burn, even as people are trying to run across it, literally melting into the pavement themselves as they run. Victims, on fire, jump into rivers, only to catch fire again when they surface for air. Yet it is hard to see even these pitiable souls as the least lucky ones in a nuclear attack.

For the survivors of the initial blast who do not then die in the firestorm that follows, many will die painfully over the next few weeks, often after a brief, hopeful period where they appear to be getting better. It might begin as a tingling sensation on the skin, or an itching, which starts shortly after the blast. These symptoms are signs that the body is starting to break down internally, at the molecular level. The insides of those who get a severe dose of gamma radiation, but manage to survive the other traumas, whose organs had once been well defined as lungs, liver, heart, intestines, etc., begin to resemble an undefined mass of bloody pulp. Within days, or perhaps weeks, the victim, usually bleeding painfully from every hole and pore in their body, at last dies and receives their final mercy.

But this too will probably not be how most victims of a nuclear attack will die.

A significant percentage, probably most, of the people who die from a nuclear attack will die much later, from the widespread release of radioactive material into the environment. These deaths will occur all over the world, for centuries to come. Scattered deaths, and pockets of higher mortality rates, will continue from cancer, leukemia, and other health effects, especially genetic damage to succeeding generations.

Nuclear weapons do not recognize the end of a war, or signed peace treaties, or even the deaths of all the combatants. They simply keep on killing a percentage of whoever happens to inhale or ingest their deadly byproducts.

Some deaths will occur hundreds and even thousands of miles away, because low levels of ionizing radiation are capable of causing the full spectrum of health effects, albeit at a lower rate within the population. Not to mention the radioactive runoff from the rivers and streams that flow through the blast area and the area under the radioactive mushroom cloud's drift. It may carry its deadly cargo for thousands of miles, raining a fallout of death only on some cities, and not on others. It will land upon nations which had not been involved in any way in India's dispute with Pakistan. These nations will be mighty hurt and mighty upset.

Nuclear weapons do not recognize international borders.

Finally, an atmospheric blast of a nuclear "device" creates an EMP (Electro-Magnetic Pulse) which can be as large as Pakistan or even India -- perhaps even larger than India and Pakistan together. The higher the altitude of the blast, the bigger the circle of damage will be from the EMP. This is a very serious concern for those of us in the high-tech industries, such as myself.

The Electro-Magnetic Pulse will electrify all sorts of metallic structures that are not normally electrified except by the occasional short circuit or lightning strike. This will be a lot like the whole country getting struck by lightning all at the same time.

As computer chips make better and better use of "real estate", using more and more delicate electronic circuits, the more tightly-packed transistors, capacitors, diodes and resistors become more and more vulnerable to the EMP which will be carried into the chips via the connecting wires. The Electro-Magnetic Pulse is one of the reasons above-ground testing was stopped. (The other

reason was that it became impossible to deny that the radiation dispersed by the tests was killing people.)

Pacemakers, for example, may stop working because of the "hit" from the EMP. It will be quite something to see people in a thousand mile radius of the epicenter of the blast (or further) who are using pacemakers, suddenly drop dead, and all the computers permanently go down and all the lights go out, all at the same time. And commercial and private aircraft will drop out of the sky, since their sensitive electronics and fly-by-wire systems are not very well shielded from the EMP. These planes will then not be available for evacuation purposes, nor will they be available to air-drop food, water, morphine and cyanide, all of which will be in great demand throughout the area.

A year ago people were dancing in the streets over this in both India and Pakistan. Why?

Home plumbing systems and most other plumbing systems are good examples of large metallic structures that will suddenly become electrified, destroying the motors, gauges, electronics, etc. which are attached to the plumbing systems. More and more pumping equipment is computer controlled nowadays for efficiency. Imbedded controllers are becoming prevalent but as they do, the potential damage from the Electro-Magnetic Pulse increases dramatically.

Train tracks will also carry the charge, as well as telephone wiring. All these things will have a nearly simultaneous surge of energy sent through them, igniting gas containers such as fuel storage tanks, propane tanks, and so on. Whatever doesn't blow up will at least stop working.

My country has lived under the Russian and Chinese threat of nuclear war for many decades now, and it is not a pleasant thought. This is nothing to dance about. There is no benefit to having, or using, nuclear weapons.

I think the world would be a better place if we all stopped and said, "I will not be a part of this. I do not need these weapons, for I would never commit this sin against my own children, nor against my neighbor's children, nor against my enemy's children, nor even against my enemy. I choose not to be a part of this madness."

There is a greater battle mankind must fight than against each other. Humanity's fight right now, is for humanity's general survival despite depleted and poorly used resources, environmental degradation (there is none greater than that from a nuclear explosion), dwindling effectiveness of antibiotics and other wonder drugs, an uneven distribution of available food, knowledge and wealth, and against weapons of mass destruction.

America had three excuses for her previous use of nuclear weapons in war, which we plead every time it is mentioned. First, we claim that we did not understand back then (over 50 years ago) all the ways nuclear weapons damage the Earth and her living inhabitants. Second, we claim that there was a war going on, and that had we not used these weapons, perhaps a million soldiers would have died invading Japan instead. But this second excuse is weakened by the knowledge that Japan was at that time very near collapse anyway. She was without an air defense, a sea defense, she did not have advanced radar, she had lost all her good pilots, millions of soldiers were either dead,

wounded, captured, or uselessly stuck on nameless islands in the middle of the Pacific, and towns in her homeland was being firebombed on almost a nightly basis.

Our third excuse was that both Japan (and definitely Germany) were building their own nuclear weapons, and DEFINITELY would have used them against us had they succeeded in developing "the bomb" before the war ended. The war could not go on forever. We were, indeed, running out of time.

Perhaps these excuses are insufficient, but India and Pakistan hasn't even got them. India can, and therefore should, along with Pakistan, renounce nuclear weapons and the nuclear option. Perhaps her populace does not understand the full nature of the threat of nuclear weapons, and thus they are dancing in the streets, but I hope that her leaders do. However, I strongly suspect most of them are unaware of the things I have written about in this newsletter. Perhaps you, dear reader, will help me to educate them in this matter.

Sincerely,

Russell D. Hoffman