

# ANUMUKTI

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## A RARE FLOWER: Dr. Kusuma Soraba

The diminutive five-foot frame, thin as a reed, did not reveal the dynamo within. But in a crisis her gift of fight came in full force. If there was one characteristic of her I would list at the top, it was this: she was not one to accept limitations either in herself or others. She would want to push everyone to try and move higher. Not that she was ever unkind or inconsiderate. She just wanted everyone to aim higher and put in their best effort

'Snehakunja' - 'friendly nest', was her dream. The rural hospital, near Honnavar, by the ocean, has a history of personal sacrifice and determination behind it. Kusumakka (as we called her) came from a conservative rural middle-class family. An aunt of hers was a nurse and that was an exception for women in the family. With difficulty, she persuaded the aunt to prevail upon the family to send her to Bombay to train as a nurse. Though Kusuma's dream was always to become a doctor, she could see no possibility of that, due to economic reasons. However, permission for a nurse training was a good starting point to breakaway from home and bindings.

She worked very hard. Always eager to team more, she hung around dissections and autopsy performances, together with the medicos, whenever she could. This aroused the curiosity of a senior faculty member who helped her to learn more. He even suggested that she could try and do

M B B S instead. The suggestion sowed the seed of a desire which slowly grew into a resolve. Typical of her, once resolved, nothing could stand between her and the aim. After she trained as nurse, she enrolled for M B B S and worked as a private nurse to support herself and her studies. No nurse was ready to be on night duty at the morgue in the hospital. Kusuma went on a satyagraha and got that assignment to get the needed income.

Kusumakka always kept an open scientific mind. She once told me this story: 'In the hospital where she studied, a big donation had been given to set up a high-tech (top-class) burn care ward. The ward was special with high charges. The patients were not allowed to eat normal food from home and were administered some sterile regulated hospital nutrition only. Contact with the family was also minimum in the ward, to avoid possible infection. Kusuma found that recovery of burn victims was better in the ordinary ward where patients had more family contact and ate normal home food, even when their burns were of a worse degree. Patients with far less serious burns too healed slowly in the special ward. When she pointed out this to the doctor in-charge, he said, "perhaps you are right But keep that to yourself. The grant and the ward are important to the hospital."

The callous treatment of poor patients and the appalling hygiene affected Kusuma deeply. During one of her fights on behalf of the patients, she had no time to look after her own eye infection. Though she was aware of the danger, she ended up paying the price - and lost her eye. In her suffering came her next resolution - to set up a rural hospital where the poor are treated with respect and affection. With grit, she did her masters in surgery, with the ideal of saving rural lives.

Though a surgeon, her inclination was always towards natural health care. The patients were made to do yoga and pranayama on the beach or the hospital roof in the cool breeze of the dawn. They got massage, steam bath, mud packs, undertook fast or were administered ayurvedic medications. Allopathic medicines and surgery were the last resort at Snehakunja. All the "five-star" treatment was given to the rural poor for a symbolic fee, as Gandhi had envisioned.

### *A true feminist*

The hospital was only a part of her work. Snehakunja trained young women and men in nursing, social work and struggles, gardening and environment protection. Kusuma's commitment to the cause of the environment broke all barriers. Moved by the rural poor's plight in selling the soil from the paddy-lands to brick kilns

and the latter's destruction of the surrounding forests moved her to her first struggle against the series of brick kilns along the coast. She organised the people and educated them on the dangers of losing their natural resource base.

The environment movements had just begun in the State - against the various dams, the protest against Harihar Poly fibres denuding the forests, the Kaiga Atomic Power Plant... Everywhere, Kusumakka took her team of young women and men, writing and singing inspiring songs, shouting slogans, devising and acting street plays, she livened up all gatherings and rallies. At the peak of the popular movement against the Kaiga nuclear power station, all the roads had been blocked and heavily policed to prevent the rally from reaching the site, undeterred by the gaping deep foundation pits, she jumped in and planted a peepul sapling. She had also asked the fishermen to reach the site by boats through the Kali river.

Sharavathy Valley was one she had saved many times, through dharnas and fasts. In a dramatic incident once she perched and sat on the drum containing the tenders called for clearing the forests for the Sharavathy Tail Race project. (This project had been stopped through a public interest litigation.) Once Kusumakka sat in a month long dharna together with teams of young women colleagues in the deep forest. Recalls one of those women, "...we were all women. In the middle of the forest, anything could have happened to us. It would have been easy for a bunch of rowdies to have intimidated and harmed us. But because of her name, none even dared to talk to us lightly."

Together with village women, Kusuma had started campaign against alcohol. Refusing bail, she spent six weeks in prison, spinning, writing songs and skits, involving and inspiring co-prisoners. Her time was demanded by not only the State level movements but also by national level movements. She kept pleading with friends to find doctors to look after her hospital work so she could be more free for total

dedication to saving the environment. "Save Uttara Kannada District" (from the string of destructive projects) should be our campaign, she kept saying.

She was always too early a bird to be caught by the slow grinding wheels of the establishment: **When** the dome of the Kaiga atomic plant collapsed, she zipped across the 120 kilometres in the middle of the night, interviewed the workers and others and conducted her inquiry before the authorities woke up and closed off the place. One of the last concerns that tormented her much was the danger posed by



the big crack in the Kodsalli dam- one of the huge dams near Kaiga. She trekked all over, together with the shepherds who had first sighted the gaping crack, took photographs and alerted the district authorities and the public. She convinced the Karnataka Power Corporation.

### ***A demanding role model***

Kusumakka wanted her girls to be free, enterprising and fearless as herself. She wanted them to be always update and learn new things. Sometimes she would push them hard. Opportunities were offered to them to learn on hand. She loved animals dearly. Her cats and dogs ate with her. Her

last acquisition had been a horse, she **wanted to be able to go to** remote villages, when needed, on horseback. She wanted **her** girls to **learn** horse-riding as well. She **had** declared once that three things were close to her heart, viz., nature, animals and mentally retarded children. She had done a **lot** for them all. The one-woman army had saved the Sharavathy Valley many times from the axe of the contractors.

The Valley, the forests will weep as will all the animals. The young women who might have been annoyed at having been pushed to do their best will slowly realise **that** a true friend and a role-model (if they wanted) is missing from their midst.

Kusumakka was not bound by others' rules - she made her own. Much to everyone's surprise, when she had passed 50, she adopted a baby boy. True to her expansive nature, she named him Bharath. She wrote and sang inspiring lullabies of universal love to little Bharath. Eight-year old Bharath's extraordinary mother is no more to lead him.

(For some lime now, I had been wanting to do a character sketch of Kusuma, to introduce her to a wider world. This writing had, in fact, been started when she was alive. But it seems fate had willed that the (lower (Kusuma means a flower) blush unseen by many. She was run-over and killed on the highway when she was returning from Bangalore on 14-3-98, after having consulted a lawyer to file a petition against the dam in the Sharavathy Valley. She was 61.)

***K. Krpa***



# Rotblat: An exemplary man of the nuclear age

Jonathan Schell

In 1939 he initiated research on atomic weapons in Liverpool, England. In 1944 he came to the United States to work for the Manhattan Project. In December of that year—seven months before the weapon was first tested at Alamogordo and eight months before it was dropped on Hiroshima—he resigned his job. Rotblat had agreed to work on the bomb only because he feared that Hitler would win the war. He resigned when he learned that the German atomic bomb program had failed. When the peril that had justified his work on the bomb ended, he ended his work on the bomb. He was the only scientist working on the Manhattan Project to do so. His act provides lonely testimony to the capacity of human reason and will to overcome the powerful momentum of nuclear armament.

Today, the justification that Western nations gave themselves for possessing nuclear weapons—the Soviet threat—has ended and the question the entire West has to ask itself is the one Rotblat asked in 1944: When your reason for having nuclear weapons vanishes, do you end your work on them, or do you search for some new reason to go on? In the poem "Anthem for St. Cecilia's Day" W.H. Auden characterized modern man as the "impetuous child with the tremendous brain." Rotblat, and Rotblat alone among the nuclear scientists in the months just before the advent of the atomic age, gave proof that it was possible for people to act with restraint and take moral responsibility for the products of that tremendous brain. After the war, Rotblat went to work to rein in and eventually eliminate the weapon he had helped to create. He became, among other things, a co-founder of the Pugwash Conference on Science and World Affairs, an international organization of scientists that has worked since its inception in 1954 to reverse the nuclear arms race, and it was for this work that he won the Nobel Peace Prize.

## *Why work on the bomb?*

"My rationale was that the only way to stop Hitler from using a bomb against us would be if we also had it and threatened to retaliate. In other words, it was the concept of nuclear deterrence. I may have been the first person to develop this concept." Rotblat laughed at the thought. These days he derides the idea that during the cold war, nuclear deterrence prevented wars. "How many more wars are needed to refute this argument?" he asked in his Nobel acceptance speech. He also rejects the claim that deterrence stabilized the relationship between the two superpowers. "Neither side," he said to me, "was ever sure that it could destroy the other side after suffering a first strike. That is why each side kept trying to make its own arsenal more powerful and the other side's more vulnerable until they built the unbelievable number of some 80,000 nuclear weapons."

"What do you make now of the reasoning that led you to work on the bomb?"

"I often ask myself how I would behave if the same situation recurred. And, yes, I feel that I might make the same decision, although in several respects I was mistaken. First, I didn't know that the Germans had given up work on the bomb a long time before I quit. Second, I didn't realize that so-called nuclear deterrence doesn't work with people who are irrational, as Hitler was. I now think that if he had had the bomb he would have used it. And, third, I was naive in believing that once we scientists had produced a weapon, the military and civilian leaders would listen to us regarding how it should be used."

## *Degradation of Moral Standards*

I asked why he thought the other atomic scientists had not acted as he had done once Hitler lost the war.

"I believe that war has a terrible effect on our behavior, on our moral standards," he answered. "One person who comes immediately to mind is Robert Oppenheimer. If you looked at his outlook on life, his philosophy, you wouldn't believe that such a man would advocate the use of the bomb on Hiroshima—on civilians—and yet he did. He could have stopped, he could have said no, but he did not. and later on I found that his moral decay—in a way, his moral disintegration—had begun even before that, in 1943. You know that the first reactor came into being in December 1942 in Chicago. This was the first time it became possible to produce large amounts of strontium 90—the radioactive fission product. He wanted to spray it on German soil, so as to poison the food and kill people. And there's a letter that he wrote in 1943 to (Enrico) Fermi, who was in charge of the reactor, saying that we should not begin the project unless we could produce enough (strontium 90) to kill half a million men. This was utterly barbaric. It tells me that the war had affected him. It's one reason that I'm so much against war—not only because of the physical privation and suffering but also because of the mental breakdown."

## *No First Use*

There are three areas in which Rotblat, who has written extensively on abolition (and edited a book, *A Nuclear-Weapon-Free World*, on the subject), has brought his attention to bear with particular insistence and force. The first is his advocacy of a nuclear no-first-use treaty—no-first-use being the policy that nuclear weapons should be dedicated solely to the mission of deterring other nuclear weapons. They should have no role in deterring conventional war, much less in actually repelling conventional attacks. If the pathways of escalation from conventional war to nuclear war were blocked, Rotblat has suggested, nuclear war would

become less likely, but he advocates no-first-use for another reason: its role in making nuclear abolition possible.

"The most important step at the present time—and this can be taken virtually overnight—is for the nuclear powers to declare that the only purpose of possessing nuclear weapons is to deter a nuclear attack," he said to me. "If the nuclear powers can agree on this, and follow it up with a global treaty of no-first-use, this in my opinion would be the breakthrough we need. It prepares the way to go to zero, for if each nuclear power possesses nuclear weapons only to deter other powers' nuclear weapons, and all were to agree to eliminate them, then no one would have any reason any longer to retain them. And it is something that can be done without an extraordinary verification system. I would put it at the top of my list of things to do."

Unfortunately, he observed, the nuclear powers cling, overtly or tacitly, to other justifications for keeping nuclear weapons. As the Nuclear Posture Review and the new Presidential Decision Directive made clear, the United States deploys nuclear weapons to deter a potential threat from some future hostile Russia and to deter chemical or biological attacks by "rogue" states. Rotblat joins General Horner in arguing that a nuclear-weaponless United States, which would remain "the most powerful nation in the world," has less to worry about and more to gain from abolition than any other country.

### *Societal Verification*

Still, Rotblat calls for the most stringent verification systems technically possible for any future abolition agreement. Of particular importance, he said, would be verification of commercially produced plutonium, whose global stocks are already far greater than the amount of plutonium that might be removed from decommissioned nuclear weapons. He has concluded that verification within a range of 99 percent accuracy might be possible. Still, considering the amount of plutonium in the world, even 1

percent is "too much, because even 1 percent would be enough to make many bombs."

This admission brought him to the second area in the field of disarmament in which he has taken a particular interest "We should establish a system of societal verification," he said. "In societal verification, citizens—including, especially, scientists—acquire a legal obligation to report on any efforts to build weapons of mass destruction." Any global abolition treaty should itself create the obligation. "A clause of the treaty would mandate all signatory nations to pass national laws that make it the right and the duty of every citizen to notify international authority of any effort to circumvent the treaty. This would apply especially to scientists. To make nuclear weapons you need two things. One is special equipment and the other is a certain brainpower. If violations are occurring, scientists will realize that something is going on. With this societal system of verification in place in addition to all the technical means, the chances of any nation building up a nuclear arsenal in a completely clandestine way, without its being detected, is extremely small."

### *World Without War*

In connection with his work on verification, Rotblat has subjected the various possible forms of "breakout" to analysis. The most likely violator, he has observed, would be a former nuclear power. Such a power, however, certainly would be highly unlikely to circumvent an abolition agreement merely to confront a conventional threat by a smaller power. That leaves "the possibility of a political situation that deteriorates so badly between two great military powers that they feel compelled to resort to military measures, even leading to the use of nuclear weapons." However, such a crisis probably "would be seen coming for a long time." Even if "both sides start to rebuild their nuclear armories," the outlook, however ominous, would be "better than at the present time," in which nuclear powers already possess large arsenals on a hair-trigger. The likelier case would be a small

power that "clandestinely" built up "a nuclear armory for aggressive purposes" Such a country would likely face "the combined conventional military might of the whole world" Under such circumstances, "no rational leader is likely to take such a risk for gains that are bound to be short-lived." There is, of course, the danger that an "irrational leader" or "fundamentalist regime bent on launching a holy war" might build nuclear weapons. The special difficulty in such cases is that a military reprisal might "not be a deterrent." On the other hand, such cases are "unmanageable now." Rotblat concludes that while the dangers of breakout are real, taken together they are far smaller than the dangers we now run daily in our nuclear-armed world.

Rotblat's conviction that scientists should take responsibility for the consequences of scientific inventions leads him to a third area of concentration. He believes that although nuclear abolition need not await general and complete disarmament, it nevertheless should be seen as a way station to a world without war. "Even now," he said, "many people still feel that we can fight a nuclear war and get away with it. They don't realize that for the first time in history man has acquired the means of destroying his own species in a single action. But even the elimination of nuclear weapons will not bring full security. Nuclear weapons cannot be disinvented. Therefore it is true that in a military confrontation nations will be tempted to rebuild them. Also, while nuclear weapons are the first means man has developed for destroying his own species, they will not be the last. Scientists can invent other means for the full destruction of the species. It is already recognized that further research is likely to bring these means into being. In such circumstances, any war can threaten us, because any war can escalate without limit. These are my reasons for believing that the long-term objective must be not just nuclear disarmament but a world without war.

"Of course, people say that this is Utopian, much harder than the abolition of nuclear weapons. I argue that if you look at the actual trend in history in recent years.

*Continued on page 7*

## Winning the Right to Oversee

## The Race is Over

FREEMAN DYSON

To settle a lawsuit brought by 39 environmental and peace organizations, the US Department of Energy (DOE) signed a landmark agreement which would increase public oversight of its efforts to address severe contamination problems in the country's nuclear weapons complex.

The settlement ends nine years of litigation charging that the DOE failed to develop its "cleanup" plans properly. The DOE had faced a contempt of court hearing for not complying with a previous legal agreement in the case.

Key elements of the settlement include: —Creation of a regularly updated, publicly accessible database including details about contaminated facilities and waste generated or controlled by the DOE's cleanup, defense, science and nuclear energy programs, including domestic and foreign research reactor spent fuel, listing characteristics such as waste type, volume, and radioactivity, as well as transfer and disposition plans. —DOE funding for at least two national stakeholder forums to assure that the database is comprehensive, accurate and useful. —Completion of an environmental analysis, with public input, of plans for "long-term stewardship" at contaminated DOE sites to ensure protection of the public and the environment —Establishment of a \$6.25-million fund for non-profit groups and tribes to use in monitoring DOE environmental activities and conducting technical reviews of the agency's performance. —Payment of plaintiffs' legal fees and expenses incurred to litigate this case. —Continuing federal court oversight to assure adherence to the agreement

"I'm really excited! This is a major victory both for the environment and for public participation," said Marylia Kelley, of Tri-Valley CAREs in Livermore, California, one of 39 plaintiff groups. "We have won access to the tools the public needs to  
*Continued on page 7*

A few years ago I walked into a room where there were forty-two hydrogen bombs lying around on the floor, not even chained down, each of them ten times as powerful as the bomb that destroyed Hiroshima. This experience was a sharp reminder of the precariousness of the human condition. It encouraged me to think hard about ways to improve the chances of survival of my grandchildren. Nuclear weapons remain, as George Kennan has said, the most serious danger to mankind and the most serious insult to God.

The disappearance of nuclear weapons from our thinking about the future is a historic change for which we must be profoundly grateful. Fifty years ago and for many years thereafter, nuclear weapons dominated the landscape of our fears. The nuclear arms race was the central ethical problem of our age. Discussion of the ethical dilemmas of scientists centred around bombs and long-range missiles. The evil face of science was personified by the nuclear bomb designer. Now, quietly and unexpectedly, the bombs have faded from our view. But they have not ceased to exist. The danger to humanity of huge stockpiles in the hands of unreliable people is as real as ever. Yet the bombs are not mentioned in our vision of the future. How could this have happened?

In the summer of 1995 I took part in a technical study of the future of the United States' nuclear stockpile. The study was done by a group of academic scientists together with a group of professional bomb designers from the weapons laboratories. The purpose of the study was to answer a question. Would it be technically feasible to maintain forever a stockpile of reliable nuclear weapons of existing designs without further nuclear tests? The study did not address the underlying political questions, whether reliable nuclear weapons would always be needed and

whether further nuclear tests would always be undesirable. Each of us had private opinions about the political questions, but politics was not the business of our study. We assumed as the ground rule for the study that the weapons in the permanent stockpile must be repaired and remanufactured without change in design as their components deteriorate and decay. We assumed that the new components would differ from the old ones when replacements were made, because the factories making the old components would no longer exist. We looked in detail at each type of weapon and checked that its functioning was sufficiently robust so that minor changes in the components would not cause it to fail. We concluded our study with a unanimous report, saying that a permanently reliable nuclear stockpile without nuclear testing is feasible. Unanimity was essential

Unanimity was made possible by the objectivity and the personal integrity of the four weapons designers who worked side by-side with us for seven weeks, John Kammerdiener and John Richter from Los Alamos, Seymour Sack from Livermore, and Robert Peurifoy from Sandia. They are impressive people, master craftsmen of a demanding technology. They have spent the best part of their lives planning and carrying out bomb tests. They remember every test, whether it succeeded or failed. They know why each test was done, and what was learned from its success or failure. Their presence was essential to our work, and their names on the report gave credibility to our conclusions. They are survivors of a vanishing culture. They lived through the heroic age of weapon-building. They will not and cannot be replaced. By working on this study, they unselfishly helped our country to move safely into a world in which people with the special qualities and talents of these four men will no longer be needed.

The conclusion of our study was a historical landmark, commemorating the fact that the nuclear arms race is finally over. The nuclear arms race raged with full fury for only twenty years, the 1940s and 1950s. Then it petered out slowly for the next thirty years, in three stages. The science race petered out in the 1960s, after the development of highly efficient hydrogen bombs. Nuclear weapons then ceased to be a scientific challenge. The military race petered out in the 1970s, after the development of reliable and invulnerable missiles and submarines.

### *More Trouble Than They Are Worth*

Nuclear weapons then ceased to give a military advantage to their owners in real-world conflicts. The political race petered out in the 1980s, after it became clear to all concerned that huge nuclear weapons industries were environmentally and economically disastrous. The size of the nuclear stockpile then ceased to be a political status symbol. Arms control treaties were concluded at each stage, to ratify with legal solemnity the gradual petering out of the race. The atmospheric test ban of 1963 ratified the end of the science race, the ABM and SALT treaties of the 1970s ratified the end of the military race, and the START treaties of the 1980s ratified the end of the political race.

How may we extrapolate from this history into the world of the 1990s and beyond? The security and the military strength of the United States now depend primarily on non-nuclear forces. Nuclear weapons are on balance a liability rather than an asset. The security of the United States will be enhanced if all deployments of nuclear weapons, including our own, are gradually reduced to zero. For the next fifty years we should attempt to drive the nuclear arms race in reverse gear, to persuade our allies and our enemies that nuclear weapons are more trouble than they are worth. The most effective moves in this direction are unilateral withdrawals of weapons. The move that signalled the historic shift of the arms race into reverse gear was the unilateral withdrawal of land-based



and sea-based tactical nuclear weapons by President Bush in 1991. Chairman Gorbachev responded quickly with similarly extensive withdrawals of Soviet weapons. The testing moratorium of 1992 was another effective move in the same direction.

To drive the nuclear arms race further in reverse gear, we need to pursue three long-range objectives: world-wide withdrawal and destruction of weapons, complete cessation of nuclear testing, and an open world in which nuclear activities of all countries are to some extent transparent. In pursuing these objectives, unilateral moves are usually more persuasive than treaties. Unilateral moves tend to create trust, whereas negotiation of treaties often tends to create suspicion.

Our nuclear stockpile study fitted well into the context of the reverse-gear arms race. The purpose of the study was to achieve a technical stabilisation of our stockpile, to clarify what needs to be done to maintain a limited variety of weapons indefinitely without testing. Stabilisation is the essential prerequisite for allowing the weapons to disappear gracefully. Once a stable regime of stockpile maintenance has been established, the weapons will attract less attention both nationally and internationally. They will acquire the qualities that a stable nuclear deterrent force should have: awesomeness, remoteness, silence. Gradually, as the decades of the twenty-first century roll by, these weapons will become less and less relevant to the problems of international order in a hungry and turbulent world. The time may come when nuclear weapons are perceived as useless relics of a vanished era, like the horses of an aristocratic cavalry regiment.

maintained only for ceremonial purposes. When nuclear weapons are generally regarded as absurd and irrelevant, the time may have come when it will be possible to get rid of them.

### *Abolish War*

The time when we can say goodbye to nuclear weapons is still far distant, too far to be clearly envisaged, perhaps a hundred years away. Until that time comes, we must live with our weapons as responsibly and as quietly as we can. That was the purpose of the stockpile study, to make sure that our weapons can be maintained with a maximum of professional competence and a minimum of fuss and excitement, until in the fullness of time they will no longer be considered necessary. In the meantime, the ethical dilemmas concerned with non-nuclear weapons and non-nuclear warfare remain unresolved.

The abolition of war is an ultimate goal, more remote than the abolition of nuclear weapons. The idea espoused early in the nuclear age by Oppenheimer, that the existence of nuclear weapons might lead to the abolition of war, turned out to be an illusion. The abolition of war is a prime example of an ethical problem that science is powerless to deal with. The weapons of non-nuclear wars—guns and tanks and ships and aeroplanes, are available on the open market to anybody with money to pay for them.

Science cannot cause these weapons to disappear. The most useful contribution that science can make to the abolition of war has nothing to do with technology. The international community of scientists may help to abolish war by setting an example to the world of practical co-operation extending across barriers of nationality, language, and culture.

*Freeman Dyson*  
*From a talk delivered at Harvard College*  
*on March 6, 1997*

you find that we are half-way there—or perhaps more than half. In my own lifetime I have lived through two (work) wars and in both of these France and Germany were the principal antagonists, mortal enemies, and yet in the course of a few decades the idea of France and Germany going to war became inconceivable. In Latin America, only a few years ago, most governments were dictatorial military regimes. Now, except for one or two countries, they are democratic and no longer talk about fighting one another. The main enemy now is poverty, which we don't need a war to fight"

■ Winning... (from page 5)

monitor the DOE's compliance with the nation's obligation to address the radioactive and toxic legacy of nuclear weapons production". "DOE is currently gearing up its nuclear weapons research and development activities—the same kinds of activities that created this environmental disaster. Now, for the first time, using the DOE's own data, we'll be able to demonstrate the link between cause and effect, a powerful argument against any further nuclear weapons design and production."

Many of the groups first sued the DOE in 1989, claiming that the agency must conduct a thorough analysis before moving ahead with plans to address the radioactive and toxic legacy of nuclear weapons production and modernize its facilities. The next year, the DOE signed a legal agreement promising a full public review of its proposals. In 1994, however, DOE leaders decided to abandon the Environmental Restoration Programmatic Environmental Impact Statement process without consent of the plaintiffs.

Source: Press release of plaintiffs. 14  
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# Nuclear South Asia: 'Now I am become death'

## A View From Bangladesh

Imtiaz Ahmed

With both India and Pakistan conducting a series of underground nuclear tests in May 1998, two of the South Asian countries joined an exclusive Club whose behind-the-veil motto was best summed up by Robert Oppenheimer, the father of US atomic bomb. On seeing the first atomic explosion at Alamogordo, New Mexico, on July 16, 1945, he said: "Now I am become death, the destroyer of worlds!" The question now is, will India and Pakistan's joining the exclusive Club change South Asia? The question deserves serious considerations not so much for reasons of military strategy or technology as for what it has done or is likely to do to the South Asians socially and psychologically.

Oppenheimer's statement, incidentally, is a direct quote from the Bhagavad Gita. Until the first test at Pokharan in 1974, I, as a member of the South Asian community, took solace from the fact that Oppenheimer sought refuge in the wisdom of the East in highlighting the follies of the West. Little did I realize then that Oppenheimer's spontaneous remark carried no weight on the people in the midst of whom the wisdom, or rather the cautionary note, had originally developed. But then, there was no reason why it ought to.

### *Bedeveled by Modernity*

South Asians were bedeviled by modernity long before the modern West became nuclear. A precise kind of modernity, however, took roots in this part of the world. Largely as a result of the colonial experience. South Asia by the beginning of the twentieth century became, what Nirad C. Chaudhuri sarcastically referred to as, 'the provincial edition of the civilisation of Eu-

rope, palely reflecting like the moon, its borrowed light from the great sun beyond/ This was as true in politics and economics as it was in science and technology. Nuclear development, therefore, was a logical culmination of India and Pakistan's craze for developing their respective national states in the image of the modern West.

To put the current debate in a proper perspective, India's policy to go nuclear had little to do with China's nuclear development. In fact, India's nuclear programme is a pre-independence thing, with the Indian Board of Atomic Energy Research being established as early as 1946 under the able modernist, Bomi J. Bhabha. Countries now point out that even the otherwise pacifist Nehru was so impressed by Bhabha's atomic quest that soon after independence he wrote to his Defence Minister Baldev Singh that not only did the future belong to those who produce(d) atomic energy, but 'Defence (was) intimately connected with this.' A modernist, and more so a dependent one, could hardly have thought differently. The first Pokharan test, for that matter, came in the wake of India's long, somewhat overdrawn, investment on nuclear R&D. In this sense, there is hardly any difference between the so-called secular Congress, under whose auspices the first test in 1974 took place, and the communal BJP, which gave the green signal for the tests in May 1998. Both chose to nuclearize India and fashion its development in the image of the modern West. Friends and foes of nuclear India, both within the country and beyond, were all mesmerized

There were good reasons for the BJP to make the event an expression of Hindutva and Indian nationalism. The two, indeed, became synonymous, and that again, almost officially, once the BJP was voted into power. In fact, policy-watchers in Delhi now point out that the BJP gave the green signal to Kalam and his team the day they won the confidence vote in the parliament. There is some merit in this observation, particularly in view of the heavily leaked secret that the tests were to be carried out before the CTBT deadline of September 1999, lest investment on nuclear R&D become difficult to carry through. Time-wise, therefore, the BJP ought to be credited only for making the best of it. But then, why BJP and not Rao, Gowda or Gujral?

In the post-independence phase, the fervour of 'Indian nationalism,' particularly within the majority community, could develop and prosper only by way of advocating it as Hindutva- nothing more, nothing less. Not surprisingly, therefore, the minority communities in India are advocating not 'Indian nationalism' but other brands of nationalism or sub-nationalism, for instance, 'Assamese nationalism,' 'Muslim Kashmiri nationalism,' 'Sikh nationalism,' 'Naga nationalism/ etc. For Rao, Gowda or Gujral, therefore, the nuclear tests could not have been made a part of 'national resurgence' or 'Indian renaissance/ lest these be taken as fuelling 'Indian nationalism,' whose other name is Hindutva within the majoritarian community. Devoid of the CTBT compulsion (that is, if we take September 1999 as the deadline), Rao, Gowda or Gujral could have gone for an early test, but this would have required desecularizing their respective parties/coalitions thoroughly. For all three, such a policy option was very difficult to undertake particularly when their entire life had been devoted to the enhancement of secularism or secular politics in India. The BJP had no such hang-ups.

A lot has been made of BJP's election manifesto and how they remained true to their long-advocated policy of making India a nuclear power. Less understood here

is the fact that for a communal party like BJP this is all that matters. In so far as it is directed towards an alien power or nation, 'national resurgence' in the post-independence phase is less meaningful for the secularists but not necessarily for the communal forces. In fact, the respective position of the two on the issue of 'national resurgence' is quite the opposite during the colonial or pre-independence time. Knowing well that the nuclear tests would result in a national euphoria, which would only give credence to Hindutva and the power of BJP, the latter could ill afford to lose time, whether on grounds of coalition politics or still-to-come CTBT compulsion. Post-independence nationalism, given its inherently communalized and fragmented nature, quite justifiably came to rest on the deadliest machine on earth - nuclear power! In the process, however, the follies of the secularists were thoroughly exposed.

Immediately after the BJP-led nuclear test, Gujral, Gowda, Sonia, even influential Left politicians, all joined the post-test euphoria. In fact, Gujral and some members of the Congress went to the extent of claiming a share in the national pride. If there was any difference in their response it was restricted to congratulating the nuclear scientists and not the government or taking exception to BJP's position that India did it for China! In the public mind, however, their joining the euphoria simply amounted to congratulating Vajpayee and his 'courageous' government. Much of this, however, changed (and here lies the follies of the secularists) following Pakistan's nuclear test. A somewhat vibrant criticism of the BJP-led nuclearization of South Asia is now in full swing, but then BJP has already scored its points. Economic hardship and an out-and-out recklessness of the leadership can now only derail BJP's political gain.

Pakistan's response was predictable, although many in India, including some nuclear scientists, thought that Pakistan was bluffing. It did not take long for Indians to realize that no exceptional merit nor another Einstein is required to produce nuclear

bombs. What is required is sheer drainage of resources and transferring/smuggling nuclear technology/materials. The hyped-up photo sessions of Kalam, Qadeer, and the like, were somewhat pathetic, almost paralleling the mythicized hero of a Bollywood/Hollywood sequence!

Again, to put the debate in a proper perspective, Pakistan's nuclear programme developed independent of India's, although it is true that its tests were a direct response to India's tests. The 1974 Pokharan test did accelerate the process, but the nuclear programme in Pakistan had a much older history. In this context, the pro-Nuke community in Pakistan was probably put in a better position by way of having India as its enemy for it could easily impress upon many in the world to supply the much-required nuclear technology or at least tolerate Pakistan's nuclear programme. The hostile situation also allowed successive governments, both Pakistan and India's, to impress upon the people the need for spending a large amount of government money for nuclear development. Whether the bulk of the people of both India and Pakistan have become strong and more secured or poorer and insecure as a result of their respective nuclear tests remains an open question. Some other consequences, however, are more predictable. For the sake of easy retention, I will enlist them under 4 S's.

1. Secrecy. Nuclear R&D have always been carried out under utmost secrecy. In practice, therefore, it remains incompatible with the openness required of a democracy. Any suggestion to the contrary is bound to kill either democracy or the state of nuclear secrecy. In fact, before the advent of high-tech x-ray machines, even nuclear scientists were required to stand wholly naked for inspection before entering their otherwise highly secured nuclear labs. Put differently, the first victims of a nuclear programme are not the enemies against whom it is carried out but rather the nuclear state's own people. One Pakistani critic, in the backdrop of the post-test Emergency declared by Sharif, commented: 'the state of emergency continues with all fundamental rights suspended. The



irony of the state turning against the very people whose lives its securing through nuclear weapons is too much for me.' India's case is no different either. I will return to that shortly.

2. Smuggling. Post-nuclear India and Pakistan will experience Western/Japanese sanctions of one kind or another. There is no escape from it. Such sanctions, however, must not be understood in the regular 'economic' sense of the term. While it is true that the transfer of high/super technology to India and Pakistan would be thoroughly discouraged/restricted for many years to come, the more routinized form of sanction will be the monitoring of South Asians, particularly scientists, entering or residing in developed countries. We already got a glimpse of that when an Indian American was made the scapegoat for the US intelligence failure(!) to detect the preparation leading to the Indian nuclear tests. Surprisingly, Pakistan carried out the tests when all the US satellites were telescoped to the test location, although none ventured to say that the US intelligence failed once again! Why invent an Indian American scapegoat in India's case, unless it is meant to question and sanction the professionalism of South Asians working in the US! But then, like sanctioning goods, sanctioning people for high-tech or nuclear technology know-how could lead to things not envisaged by the progenitors of sanctions. What I have in mind is the smuggling of technology know-how, more so in circumstances where there is a genuine demand yet there is restrictions. Put differently, nuclear development, given its horrific nature and pricy investment, reproduces a culture of smuggling, where nuclear bombs may not be smuggled but things connected to the development of nuclear bombs, including other more sophisticated conventional weaponries, are bound to be smuggled.

More at home, sanctions are bound to activate unregulated trade or smuggling across South Asian bottlers. Already critics are pointing out that both India and Pakistan are busy establishing 'bogus trading bodies' in non-nuclear South Asian states

to overcome Western/Japanese sanctions. Whatever may be the merit of this argument, given the porous nature of South Asian borders, it would be quite a task for the West/Japan to enforce sanctions against India and Pakistan. This must not be taken to mean that India and Pakistan will not be hurt by the sanctions already imposed nor non-nuclear South Asian states will desist from taking advantage of the situation by gearing up their own trades with both sanctioning and sanctioned powers. A sizeable section of this trade will, of course, be in the form of smuggling.

3. Small Arms. With the balance of nuclear terror in place, insurgent/sub-nationalist groups in South Asia will increasingly take recourse to small arms. A proliferation of the latter on a much grander scale is bound to happen. It would simply be a folly to think that suppressed individuals or dominated groups would give up their life-long struggles just because two South Asian states went nuclear! Without the option of a direct war now that both are declared nuclear powers, there will be a temptation on the part of both India and Pakistan to help each other's dissenters by way of channelizing small arms through unregulated channels. As with the smuggling of goods, the illegal flow of small arms is bound to create ruptures within both nuclear and non-nuclear South Asian states. No nuclear bomb can stop the sub-national aspirations and the corresponding violence, whether of Kashmiris, Beluchis, Muhajirs, Assamese, Sikhs, and many others throughout South Asia. In this context, it is worth pointing out that the Soviet Union broke down at a moment when it had stockpiled thousands of nuclear bombs and that again, not just in kilotons but also in megatons!

4. Psychotic. There are various aspects to this. I will highlight only two. Firstly, a sense of paranoia takes hold of the nuclear state. We have already referred to Pakistan's post-test Emergency. In India's case, the paranoia seems to have taken roots without the support of an official decree. To give one example, at a post-test Afro-South Asian conference on 'national

identity' at a city in Kerala (India), not only the entire batch of Pakistan delegates were refused visa but more interestingly. Home Ministry officials turned up at the venue and demanded not one but three copies of all papers to be presented at the conference! Even Indian delegates were thoroughly puzzled by the demand and quietly referred to it as a post-test syndrome.

Secondly, far from being awed by the 'scientific' achievement, most members come to nurture some kind of revengeful or killing mentality. This is particularly true with respect to children's response to the event. I found many Bangladeshi school goers, for instance, who busied themselves in pencil-drawing nuclear bombs for their own country! I also found adults talking about 'other kinds of bombs' or 'newer and more modernized military strategy' to counter the nuclear threat. Indeed, so horrific is the thing that the mind can hardly think anything beyond horror to rectify the thing. Nothing can be more dangerously pathetic.

The 4 S's are all pernicious not so much for informing and influencing the slate as for reshaping and reproducing the already polarized and violent civil society. The further these make their way to the latter, the quicker we all will be living in the nightmarish world of Oppenheimer. The 'death,' for that matter, has entered our imagination and activities, indeed, in a more rotten way than the divine had originally planned. The only consolation at this stage is that with this state of mind and living, the friends of nuclear weapons can go no further. On the other hand, the foes of nuclear weapons can now join hands not only within their own territory but also across national boundaries. Let us in the process of joining hands bury the nuclear-reproducing 'nation state' and create a space for a post-nationalist state of living.

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# The bomb and after

A Pakistani View

*Tahira Mazhar*

WAS it necessary to explode a bomb to satisfy ourselves as being equal to India? Were we in a position to use the same tactics as India? What has happened now? How has our dignity been enhanced by having to impose an emergency and having the rupee plunge and looking for a bail out?

We were told constantly by our foreign minister, our information minister and our finance minister that if sanctions were imposed on us, we were prepared for them and these would not have any serious effect on us. The prime minister very confidently told Pakistanis in Manchester: "Pakistan is not afraid of any economic sanctions. These sanctions are a blessing in disguise as these will help the nation to stand on its own feet and become self-reliant."

Why are we now talking of dwindling foreign exchange reserves and seeking IMF aid? Every week the State Bank issues new orders and those who brought back their foreign currency to put it in their own banks because they trusted the Nawaz Sharif government are now holding him responsible for the mess. This is one aspect of the present scenario.

Mr Nawaz Sharif during his election campaign had promised easier trade with India and cooperation in other fields. But today he seems helpless and like others talks of nothing but Kashmir. Of course the Kashmir issue should be solved, but it must be solved with the cooperation of the Kashmiri people. Many of them, it is said, want an independent Kashmir. Are we prepared for that? We must not become a hostage to the Kashmir issue, and go ahead with other problems facing the two countries. This is what Mr Nawaz Sharif talked about during his election days. I think Mr Sharif is also a hostage to a coterie of people who are against any negotiations with India. He must pick up courage and face them so that both our countries can move further towards progress and peace.

It is high time we recognised our own nation. We are not a nation which can make sacrifices. We do talk and our Press talks even bigger but when the time comes, there are not many who are prepared to do anything concrete. So let us not depend too much on the people. Of course they can be forced to sacrifice, but is it really sacrifice for the sake of safeguarding the country or to protect the power politics of the ruling coterie?

*Tahira Mazhar*

*DAWN Group of Newspapers, 1998*

Andhra Pradesh Police tries to gag popular expression against nuclearization

The first casualty of nuclear weapons is conscience. The second is democracy.

Andhra Pradesh based Organisation for People's Democratic Rights (OPDR) had invited me to speak at a meeting in Hyderabad held on 9th of August to commemorate Nagasaki Day. This well attended public meeting was held in a centrally located large hall called Ambedkar Bhavan. The meeting was followed by a rally which passed off peacefully without any instance of violence or any disturbance whatsoever.

For the meeting the organisation had published a pamphlet in Telugu and a programme notice in English. This material was pasted in public places like bus stops, walls of public offices, etc.

The Saifabad unit of the Hyderabad city police found these notices an intolerable disfigurement of the beautiful city of Hyderabad and have launched a case against Mr V Narayan Reddy who is an advocate and organising secretary of Hyderabad unit of OPDR. The case (Crime No. 376/98) has been registered under section 3 of Andhra Pradesh Prevention of Disfigurement of Open Places and Prohibition of Obscene and Objectionable Posters and Advertisement Act.

If the police were as zealous and determined in launching prosecutions against all pasting of posters and notices that disfigure the beauty of Hyderabad it would indeed be commendable. However, one finds the place crawling with posters of film advertisements and notices of various 'acceptable' political parties. Perhaps the police find that these posters enhance the beauty of Hyderabad.

Selective application of laws especially against political opponents leads to the suspicion that the prosecution is not meant to preserve the beauty of Hyderabad's official buildings but is an attempt to suppress expression of views contrary to government thinking. When these views are being expressed against so obscene and objectionable activity as the nuclearisation of India, it is indeed a travesty of the fundamental right of freedom of expression enshrined in the Indian constitution.

The High Court of Andhra Pradesh has already granted Mr Narayan Reddy a stay in the proceedings against him. However, letters to the cyber-savvy Chief Minister Mr Chandra Babu Naidu protesting against this might well be in order.

*Surendra Gadekar*

# Anti-Tests' Protests on Hiroshima Day

*Hiroshima and Nagasaki day commemorations, have normally been somewhat of a ritual Usually there is a politician or a bureaucrat lecturing bored school children about the horrors of atomic war and shedding*

*metaphorical tears in remembrance. Not this year The tests at Pokharan and in the Chagai hills ensured that all such crocodiles remained indoors while the message of Hiroshina was brought close to home. There were some large demonstrations in the metros, but more relevant were the demonstrations and awareness raising programmes in small towns and even in some villages At nuclear India. Below we have given a brief description of some of these protests.*

## Calcutta

In one of the biggest anti-nuclear demonstration held anywhere in the world, over 400,000 people marched along the streets of Calcutta to register the impassioned protest of the masses against the policy of nuclear weaponisation. The march which lasted for more than three hours was convened at the call of 66 mass organisations.

The procession was interspersed with a variety of tableaux which depicted the terrible fall-out of nuclear explosions. Some portrayed the horrors that continue to haunt the world in the wake of the nuclear attacks by the US in 1945 on Hiroshima and Nagasaki. Various organisations presented models of the kind of all-pervasive pollution that affects humanity even when comparatively 'smaller' nuclear devices are exploded, whether above the ground, below the ground, or under water.

The procession also included bands of tribal people from most of the twelve districts of south Bengal from where massive processions came to Calcutta from very early in the morning of 6th August In their own, unique manner, the tribal song-and-dance ensembles voiced their protest against all kinds nuclear 'experiments' that would ultimately harm the green earth and the people who inhabit it The variety of

the performances and the colourful costumes and masks that they wore attracted a lot of attention.

The procession that started from the Netaji Indoor stadium and from several other points of the city, traversed central Calcutta, criss-crossing the main thoroughfares many times before ending in a huge rally at the Park Circus maidan. Songs, dances, mimed-plays, street-theatre, recitations, on-the-spot paintings marked the progress of the marchers. Just before the beginning of the march, a convention was held in the packed-to-capacity Netaji Indoor stadium. The convention was addressed, among others, by the writer Sunil Gangopadhyay, the poet Sankho Ghosh, the film director Mrinal Sen and others.

## New Delhi

Shouting slogans and carrying placards proclaiming We Want Bread Not Bombs, No More Pokhrans, No More Hiroshima-Nagasaki and No Weaponisation, No Deployment thousands of people including a large contingent of school children wound their way from behind the Red Fort through the main streets of Old Delhi in an impressive Citizens March Against Nuclear Weapons.

The march culminated at the Feroze Shah Kotla grounds where a resolution was read out in Hindi and English by veteran Gandhian Nirmala Deshpande and historian Romila Thapar. Prominent per-

sonalities from different walks of life participated in the march including writer Arundhati Roy, social scientist Rajni Kothari, journalist Kuldeep Nayyar actor Raj Babbar. Artists, academics, writers, college and school students, workers, and activists of mass organisations came out in full force to lend their voice against the nuclear madness that threatens to envelop the subcontinent.

The resolution adopted at the rally noted that the tests carried out in May 1998 and the consequent provocative rhetoric "have only heightened tensions in the region, worsened relations with our neighbours and undermined popular initiatives aimed at forging peace among the people of the region" It said. "Both India and Pakistan now have the capability to perpetrate the horrors of Hiroshima and Nagasaki on each other, not once but many times. Therefore, the need to remember August 6 Hiroshima Day is particularly important. The people of India and Pakistan must stop this madness which threatens us with mutual annihilation.\*<sup>9</sup>

The resolution also asserted that India must continue to vigorously campaign to dismantle the global discriminatory nuclear regime and initiate moves towards global nuclear disarmament. The nuclear weapons powers, despite all their pious pronouncements about dismantling their arsenals, have made only marginal efforts to do so. Pointing out that their imposition of sanctions against India and Pakistan is hypocritical, the resolution said if they are



serious about non-proliferation, they must pursue a credible programme for destruction of nuclear weapons globally, starting with their own. It added, "In order to resume India's due role, India must return to the global nuclear disarmament agenda and stop any further measures towards induction and deployment of nuclear weapons. Pakistan too must reciprocate with matching measures."

### *Chennai*

A Committee Against Nuclear Weapons, called for a massive Human Chain starting from Parry's Corner - a key gathering point near the city's central bus terminus - to the Central Railway station, a distance of nearly three kilometres, on the evening of August 6, 1998.

The popular response surpassed the most optimistic expectations of the organisers. From 5 to 6pm in the evening on August 6 more than 5000 people lined up along the entire route from Parry's Corner to Central station. The composition of the crowd was as interesting as its size was impressive. There were at least two to three hundred children, a sizeable contingent of women and a not insignificant number of senior citizens.

### *Mumbai*

More than 2000 demonstrators took part in a Silent Procession from Azad Maidan to Hutatma Chowk. The programme was organised by a "Citizens Committee for Commemoration of Hiroshima and Nagasaki". More than 50 organisations including the Left parties, trade unions, Gandhians, progressive women's organisations, artists, intellectuals, environmentalists, civil liberties organisations, students and youth organisations and many voluntary organisations had constituted this Committee.

In addition to this Peace March, many local programmes were held in different parts of Mumbai. Public meetings organised by Bombay Sarvodaya Mandai and lectures in colleges, along with show-

ing of educational films like "Prophecy" are also taking place involving several thousands of students and members of the public.

Thousands of people in the state capital Agartala and in the North Tripura headquarter, Kailashar marched the streets on August 6 afternoon to assert the predominance of peace and amity over the forces of fissiparousness and warmongering on earth, marking the occasion of Hiroshima Day in Tripura. The main procession originating from Umakanta Maidan was preceded by a brief function consisting of revolutionary songs and invocatory addresses.

### *Lucknow*

A meeting was held at the Ganga Prasad Memorial Hall in Lucknow which was presided over by K.N. Kakkar, well known literary personality. The meeting was addressed by Medha Patkar, and Professor A.P. Shukla..CPI(M) polit bureau member Sitaram Yechury and socialist leader Raghu Thakur also spoke.

### *Thiruvananthapuram*

In Thiruvananthapuram, the capital of Kerala state, a three hour long programme from 10.30 am was held at the Martyrs Memorial at Palayam attended by thousands of people. The programme included songs, skits, speeches and exhibitions against nuclear weapons. The programme was organised by the A.K. Gopalan Study Research Centre. Posters, placards and banners condemning the use of nuclear weapons were put up all over the city. The programme began with a speech by Jubha Ramakrishna Pillai, the oldest surviving freedom fighter in Kerala. Students of the Model High School held up a huge banner with the words "We Share the Sorrow of Hiroshima". Well known historian K.N. Panniker released a poster with the words in Malayalam meaning —"Resist the Bomb — Or There Will be No Tomorrow."

### *Almora*

Five non-governmental organisations together organised a march in Almora town and gave a memorandum to the district collector. There has also been a continuous programme of education on the subject in schools and colleges in the area.

### *Udaipur*

A number of different organisations of Udaipur area including Seva Mandir, Rajasthan unit of People Union of Civil Liberties amongst them had together sponsored antinuclear events which included a large rally and many meetings. Dr Sanghamitra from the Anumukti team had come as one of the invitees. These events were well covered in the local press. In her speech, Sanghamitra stressed the close relationship between nuclear weapons and the nuclear energy programme saying one was the mother of the other. Ex foreign secretary Jagat Mehta in his speech said that real security is only possible by removing poverty, ignorance and disease and not through engaging in an arms race.

### *Itarsi*

The Kisan Adivasi Sangathan of Kesla had organised a silent procession in Itarsi and also issued a factsheet on nuclear issues in Hindi to commemorate Hiroshima day. The fact sheet which is in a question and answer format tries to counter many of the commonly encountered propaganda and misinformation on the nuclear issue.

### *Other Events*

There were many other places where there were similar events and demonstrations. In our neighbourhood itself at Valod there was a rally with about a thousand participants. One thing that we at Anumukti did was to bring out a Hindi edition of Anumukti This has been well received and we intend to continue to bring out more material in various languages so that information about this issue no longer remains the preserve of a few who are literate in English.

# IS ACCIDENTAL NUCLEAR WAR IMPOSSIBLE?

*Dr. Pervez Hoodbhoy*

By the decree of Pakistan's Foreign Minister, accidental nuclear war between Pakistan and India cannot occur. In a statement to the APP on November 29, Mr. Sartaj Aziz said emphatically "I see no possibility of an accidental nuclear war between Pakistan and India. Pakistan has an effective command and control system".

This categorical statement is shockingly unscientific because it presumes complete fore-knowledge of all future crises and exigencies, a complete understanding of all the possible mechanisms that could lead to a nuclear exchange, and complete confidence in India's command and control system as well as that of Pakistan's. Further, it asserts that human error, misjudgement, and miscalculation are impossible. Unfortunately, not a single assertion or presumption is logically or scientifically sustainable. On the contrary, there have been numerous tragic incidents in India and Pakistan that prove accidents and miscalculations are far from rare. At best the Minister could have argued that the probability of accidental nuclear war is small. Even though this assertion too would have invoked many questionable assumptions, nevertheless it could have been defended with some degree of plausibility. As it stands, however, the statement is factually and scientifically wrong.

It is not my intent to split hairs on an abstract academic discussion of the improbable versus impossible. The issue is far too serious for that.

One need merely note that nuclear war by accident was never derided and dismissed during the years of US-Soviet nuclear confrontation. On the contrary, both sides took this possibility very very seriously. To avert a false move during those

five long decades, the two giants spent trillions of dollars acquiring the most sophisticated forms of intelligence gathering by satellites, aircraft, ships, and submarines. The data from these were continuously analysed using computers equipped with artificial intelligence programs. This enabled both sides to know each other's level of readiness for combat, and know in advance preparations for a nuclear strike. Without such an elaborate command and control system a doomsday nuclear confrontation may well have occurred out of fear or suspicion.

Of course we know that a US-Soviet nuclear war did not occur, but the danger had never been far away. In spite of every possible precaution — and technology far more advanced than India or Pakistan can even dream of — false information provided by radar and other detection systems was a nightmare for the US and Russian militaries. There were several serious false alarms causing much alarm, and this is true to an extent even today. For example, it has recently become known that on 25 Jan 1995 the Russians mistook a Norwegian scientific rocket for Trident sea-launched warheads. This mistake lasted for a full eight minutes - only two minutes away from the launch of Russian nuclear missiles, which are 'launch-on-warning'. Today there exist fears that although a nuclear launch is meant to be authorised by the Russian President, the Defence Minister and the Chief of General Staff of the Armed Forces, and subsequently by three officers at the missile sites, nevertheless this chain of command can be bypassed. Russian officers have been known to re-wire their systems to circumvent this and some may have the ability to launch autonomously. It has also been reported that sometimes only one officer remains on duty with the two keys and the button at his disposal.

There are lessons here for all who care to learn from the experience of others. First, even the best technology is not good enough when the issue is whether or not to use nuclear weapons. Second, human intervention — either through mal-intent, ideological fervour, inexperience, or plain stupidity — can render the best plans and technology impotent. The Pakistan-India nuclear confrontation brings a special urgency to both sets of issues.

It is common to assert that since the US and Russia, each with tens of thousands of weapons, were able to survive the Cold War therefore there is no reason for Pakistan and India, which have far fewer weapons, to feel alarmed. This is wrong reasoning. What may have been considered good enough for preventing accidental US-Soviet war is simply not good enough for us. Having a common border, and with sub-continental missile trajectories of only 4-8 minutes, any type of early warning system is useless. Even if the best satellites, cameras, and computers in the world were miraculously made available to Pakistan and India, this would achieve nothing. In this ridiculously short time it is totally impossible to make a rational decision as to whether the alarm is genuine, and whether the incoming missiles are to be presumed as nuclear armed.

Because no early warning system against nuclear-armed aircraft or missiles is possible, and because there is no way for Pakistan or India to protect their respective command and control centres, there is one and only one possible course of action. This is to disperse and deploy nuclear-armed aircraft and (when available) missiles over as wide a geographical area as possible under the command of separate military units. Further each unit must necessarily

be provided the necessary authorisation codes for arming and launching the nuclear weapons in its possession.

Without providing autonomy to nuclear-armed military units, dispersal makes no sense — a single bomb on the Rawalpindi GHQ would knock out Pakistan's ability to mount a retaliatory strike. Even if the GHQ, or some other command and control centre, were somehow fortified to survive a nuclear blast in the vicinity, the electromagnetic pulse which accompanies a nuclear blast would destroy all normal telecommunications.

Hence autonomy of military units is an inescapable requirement for maintaining a credible deterrent. But, at the same time, this has a frightening cost because each unit, and not the PM and COAS, would have the final say in launching a nuclear strike against India. Could some ideologically charged Hindu-hating unit commander take destiny into his own hands? Could deliberately falsified or "honestly wrong" information reach a unit and result in its launching the weapons in its possession? No one really knows, but the chances are certainly not zero.

One could make a virtually identical argument about India. While it is true that India is much larger, and Pakistan has fewer nuclear weapons, the difficulty in setting up an Indian command and control system that will not fail is almost equally severe. It would be stupid to concentrate all nuclear decision-making in Delhi, and hence dispersal of nuclear forces is equally important for India. But the problems of dispersal are equally severe as well, and the possibility of accidentally initiating nuclear war from that end exists to a similar degree. We have no right to presume that the Indian command and control system is any more reliable than ours is.

Are these fictional, exaggerated, fears? I wish it were so. But the truth is that accidents, sabotage, and tragedy have frequently haunted our two countries. India has seen the terrible Bhopal gas tragedy.

numerous nuclear reactor mishaps, dam collapses, and industrial accidents. Pakistan has seen many tragedies too.

It was but ten years ago that an unending stream of shells and rockets rained down from the skies of Rawalpindi and Islamabad, killing about a thousand people and wounding and maiming many times that number. The immediate reaction of most people around me, with whom I watched this awesome display from my university 10 miles away, was that it was an Indian attack. Others said that Kahuta had exploded. The government behaved like a chicken with its head cut off and went around in circles. It was much later in the day that Radio Pakistan admitted that an ammunition dump, located in the heart of the city, had blown up. To this day, no official report of the Ojhri Camp disaster has been made public and the cause remains secret.

The explosion of a nuclear device would be immeasurably more serious than the blowing up of an ordinary ammunition dump. Indeed, thirty years after Hiroshima US nuclear weapon designers became conscious of the fact that in the event of fire or ordinary explosion, there is a fair chance that a nuclear weapon could undergo nuclear detonation even if it had not been readied for use. This could happen, for example, if a bomber or missile were to crash upon one's own territory. Subsequently there was a massive effort to make nuclear weapons safer, as well as construct the exceedingly elaborate electronic and mechanical safety catches called Permissive Action Links (PALs).

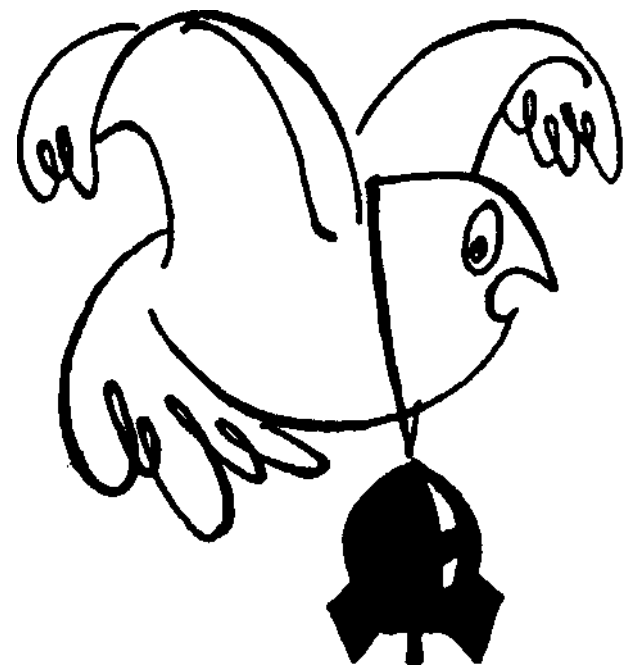
One does not know whether Indian and Pakistani nuclear weapon makers have put in the enormous effort needed to "safe" their weapons and to what extent they have succeeded or failed. But, generally speaking, our national disposition is that of risk takers. The notion of fate plays an important role in our poetry, language, and daily behaviour. Therefore, for both India and Pakistan, safety has never been an over-riding concern in driving cars and buses, disposition of toxic wastes, construction of

buildings, and so forth. Why should we assume that it would be any different when it comes to building bombs?

A nuclear Ojhri is not, therefore, impossible. When Indian or Pakistani nuclear weapon are assembled and deployed to operational units, the danger will rise in direct proportion to their numbers. If a nuclear explosion occurs for whatever reason, the natural assumption would be that the device belonged to the other side. Even if the device actually belonged to one's own side, a government, fearful of public reaction, may commit the ultimate folly of attempting a cover-up. The consequences of this could be various, including the probable initiation of cross-border nuclear hostilities.

No one knows how probable accidental Pakistan-India nuclear war is, no one knows what surprises Kashmir holds, and no mathematical equation can provide the answer we want. But let us recall General Zia-ul-Haq's famous remark, made soon after the crisis precipitated by India's Brasstacks exercises along the Pakistani border in 1986, "neither India nor Pakistan wanted to go to war but we could have easily gone to war." Therefore, to create a false sense of security in the post-nuclear age is an act of supreme folly.

*(Dr Parvez Hoodbhoy is professor of physics at Quaid-e-Azam University, Islamabad)*



# The Rip Van Winkles at IAEA begin to wake up

At a recent conference, International Atomic Energy Agency's radiation safety director Abel Gonzalez said that the world must attack the growing hazard posed by lost, stolen, damaged, and misused radiation sources. "In half the member countries of the IAEA, there is virtually no systematic management of sources," Gonzalez said. "And in about 50 more countries which are not IAEA members, the situation is even worse."

The International Committee for Radiological Protection (ICRP), Gonzalez said, has issued 70 publications but only two on sources, and none concerned with the security of materials. ICRP guidelines, he said, are "simplistic," calling for the prevention of radiation releases from sources but offering no technical guidelines. The ICRP guidelines "are only motherhood-and-apple-pie statements," he summarized.

Observers at the conference said they expected a major IAEA redirection of efforts in less-developed countries by the Division of Technical Cooperation, where the IAEA has been pushing for nuclear development in industrial programs relying heavily on use of sources, toward safer practices in using radiation sources. One IAEA official said, "From now on, if the IAEA doesn't see a solid infrastructure in a country for making sure the sources are used properly and kept track of, it won't be able to justify" programs in that country on food irradiation, medicine, and other ventures.

The Department of Atomic Energy, whose responsibility it is to ensure the safe handling of radioactive material, is not worried. But that is no surprise. Nothing worries them. They claim that India has a very fine record of safety regarding transport of radioactive material. All reports one keeps hearing of regarding missing radioactive pencils, radioactive sources in the Cooum river and so on are just mere accidents. DAE is notorious for its secretive

ways. Missing radioactive sources, unless they lead to some major tragedy are likely to be just filed and forgotten. Some years ago in Anumuku we had carried a bizarre story of a missing Techops camera with an iridium-192 source which had got misplaced in the Indian railways.

## *Not the only one*

At the international meeting in Dijon, France, middle of September, it was apparent that India is not the only country where radioactive sources go missing in trains. Some so-called advanced countries are even more advanced in following hazardous practices.

In the U.S., nearly 200,000 people and institutions have been licensed to use radiation sources and the total number of sources in their hands is about 2 million. "We have no national inventory and we are not in touch with the licensees of these sources," said one U.S. official in Dijon. The result of bad management and neglect, Gonzalez said, is a "long and worrying series of accidents all over the world, including numerous fatalities."

Since 1987, when the world was shocked by grave safety violations involving an abandoned therapy source in Goiania, Brazil, which killed four people and produced consequences which are still inflicting local hardship, the IAEA has recorded six more fatal accidents involving unsafe handling of sources. These events killed eight people and seriously injured over a score of others.

One recent incident, in Estonia in 1994, is emblematic of the tragic problems which can occur if a source is lost and authorities fail to follow up. Once it is recovered or found, said John Croft of Britain's National Radiological Protection Board.

In a scrap yard in Tallinn, a source was found by routine radiation measurement and transferred by the Estonian Res-

cue Board to a national waste disposal facility at Tammiku about 20 kilometers away. But on October 24, three unemployed brothers broke into the compound to find items they could sell to scrap dealers in Tallinn. They found a metal container with the source inside. One piece of the source fell out and was picked up by one of the brothers, who put it in his coat pocket. Soon thereafter he fell ill, and he died of severe radiation injuries to his leg and hip on November 2, 1994.

But the injury and death were not immediately traced to radiation exposure, and the remaining parts of the source were left in the house with three other family members. One, a stepson, was hospitalized on November 17 with what was recognized by doctors as severe radiation burns on the hands. Only then did the Estonian Rescue Board recover the material they had originally brought to the waste storage site back in October. But other family members were also diagnosed soon after with radiation burns. An analysis of the event by the Swedish Radiation Protection Institute suggested that the deadly item was a Russian-origin cesium-137 source with a strength of about 100 Curies.

As a result of this accident, Estonia began a program to organize its source inventory. By chance, one of the experts involved in that search had his detecting equipment switched on while driving on the road between Tallinn and Narva. He found on the road a second Cs-137 source with activity of 50 Curies in another metal container. Estonia doesn't know how many deadly sources are still at large.

## *Soviets Walked Away'*

An unpublished accident investigation report on the Estonian case by the IAEA states, "There appears to be little information on the range of sources manufactured in the former USSR." German officials said that lack of Russian information is only part of their problem in source management



They reported in Dijon that Soviet sources, mostly abandoned in military camps when the Red army decamped in 1991-93, were involved in about 12% of cases involving sources in Germany.

The Soviet military "just packed their bags and walked away" from their huge compounds and barracks in the former East Germany, one German official said. In many cases, they tore down their buildings and left piles of rubble with dangerous sources underneath. Some sources are believed to have been plowed into the ground when the area was razed for development after western German investors took over. "We'll never know the consequences until the sources are found or their contents trickle up to the surface, or down into the water supply," one German expert said. Another fatal recent case involving a radiotherapy source, in Kutaisi, Georgia, in 1996 is also the legacy of Soviet military occupation.

During that summer, several frontier guards in a camp which had been set up as a training camp for a nuclear, logical, and chemical warfare programs of the Soviet Army developed radiation lesions. A search for the cause turned up 11 Cs-137 sources, each with an activity of about 4 Curies, plus four weaker sources, of a type used by Soviet Civil Defense specialists. Some of the sources were buried around the camp site, while others were found in coat pockets. One of the victims of radiation poisoning the sources is dead.

### *Need for an IAEA Register*

Experts at Dijon said that failure of the U.S. to keep track of 1.5-million sources was typical of many large countries where sources abound and where, out of complacency, no effort has ever been made to develop a running inventory. One Russian official said that radiation protection authorities in his country had "absolutely no idea" how many sources might have been in use. "The number might be 100,000 or it might be 1-million," he said.

Guenter Weimar from Germany's Federal Ministry of environment (BMU), told the conference that outcome of the meeting should be a resolution to register lost and found sources with the IAEA. Germany learned that lesson in 1997 and this year, when four Cs-137 sources were found in three scrap heaps. German investigators found that a source, unshielded on a scrap pile last year, had been manufactured by a French firm about 30 years earlier. "But we don't know anything about its history in between the time it was made and when we found it," Weimar said. An IAEA registry of sources known to be lost or found could expedite identification across national lines, he said.

Scrap yards and steel mills are threatened with contamination when their operations accidentally melt sources found in scrap raw materials, experts noted. They, too, would be aided in watching for sources if their governments are alerted by the IAEA that sources were recently lost or reported stolen near points where the firms had purchase scrap metal. Because it was unaware that a source had melted in its scrap, the Spanish stainless steel firm Acerinox lost valuable time in following up, generated huge volumes of waste, and suffered an economic loss of about \$25-million earlier this year.

*Based on a report by Mark Hibbs in Nucleonics Week.*



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