

NUCLEAR PROLIFERATION IN SOUTH ASIA

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Abstract

It is exactly three years ago that first India and then Pakistan came out of the closet and tested their nuclear weapons. What is the situation now? Is India more secure now? Is Pakistan more secure now? Does the possession of nuclear weapons enhance the security of a state? These are the kinds of questions I would like to confront in this talk.

THE BOMB AND INDIAN SECURITY

Three years ago, on the 11th of May 1998, when India tested its nuclear weapons at Pokhran the excuse it gave was that this would enhance its security *vis-a-vis* China and Pakistan, which it perceived to be its enemies in the region. The argument was that the possession of nuclear weapons was necessary on the one hand to provide an answer to China's nuclear weapons and on the other hand to deter Pakistan from conventional warfare in Kashmir and elsewhere. Also India felt that it had to have nuclear weapons to be a major player on the world stage. The bomb was sold to the Indian public as providing more security.

As subsequent events have shown all these hopes have proved to be myths. India's claims to nuclear power status have been dismissed by the other nuclear powers. It still lacks effective deterrent capability against China. All that has happened is that the subcontinent itself has become a more dangerous and nasty place to live in. The deterrence theory lies in shreds. Contrary to the claim of the Indian government that Pokhran II enhanced Indian nuclear security, we have learnt that the Indian government is committing a sum of \$250 million to build underground nuclear shelters in Delhi from where, in case of a nuclear attack, a nuclear offensive can be directed and launched. Do the people of Delhi feel safer knowing that their country's arch-enemy has the ability to drop a nuclear bomb on them?

Before nuclearisation India had immense conventional military superiority over Pakistan. However the Indian tests forced Pakistan to also test their own atomic bombs on May 28th at Chagai. India's security interests suffered substantial damage as a result of nuclear tests. The possession of these bombs by Pakistan considerably reduced India's advantage and security in conventional terms for a very simple reason. Although India says that it has a no-first-strike policy there is no such constraint on the Pakistani side. This is because being inferior in conventional weapons it is likely to lose a full-scale conventional war. In the event of this happening, Pakistani military planners are fully prepared to use tactical nuclear weapons on the battlefield and, if this does not stop the Indian army, to use strategic nuclear weapons against a couple of Indian cities. Of course this will elicit a massive response from India, which will totally obliterate five or six cities in Pakistan. The generals in Pakistan are aware of this but are of the philosophy that if we die we will also take along many Indians.

DETERRENCE AND ACCIDENTAL NUCLEAR WAR

After Pakistan tested its own nuclear weapons, strategists on both sides of the border, especially in India, started to say that now that both sides have nuclear weapons they will not go to war conventionally because of the fear of the war escalating to nuclear war. Planners on both sides also immediately subscribed to the cold war doctrine of deterrence and mutual destruction. Indian and Pakistani strategists subscribed to the view that mutual possession of nuclear weapons prevented a hot war between the United States and the Soviet Union. They believe that similar restraints will apply to the governments of India and Pakistan, giving stability to the region. The first premise that possession of nuclear weapons prevents conventional wars was shown to be false just a year after Pokhran II when Pakistan sent infiltrators into Kashmir and started a two-month war in Kargil with the loss of about a thousand Indian troops. Pakistan could do this precisely because it knew that India could not mount a full-scale attack on Pakistan because of the fear of nuclear retaliation. Also the recent attack by Bangladeshi forces on the India-Bangladesh border shows that possession of nuclear weapons does not deter conventional armed conflicts. What was forgotten by the strategists in India and Pakistan when they took over the doctrine of deterrence was that during the cold war there was no direct territorial, religious or national conflict between the United States and the Soviet Union. On the other hand Pakistan and India have already fought three wars over Kashmir (this question is still open) and this is made worse by the rising tide of fundamentalism and religious hatred on both sides. This is a sure recipe for disaster if one now adds nuclear weapons to the mix.

The proximity of India and Pakistan on the one hand would seem to be a deterrent to the use of nuclear weapons because of the vulnerability to nuclear fall out from one's own weapons but on the other hand this very proximity leads to the enhanced danger of accidental nuclear war. In any case I believe that generals on both sides are quite callous about human life and do not care about the fall out issue. On both sides of the border politicians and generals say that there is no danger of accidental nuclear war and point to the experience of the US-Soviet confrontation. This argument ignores the facts of the case and the thousands of false alarms. On this issue let me quote Dr. Pervez Hoodbhoy, the leading Pakistan expert on this issue:

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 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 supposed to be authorized 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 those 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 commonly heard in Pakistan and India 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 our countries, 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 authorization 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 Army General Head Quarters (GHQ) would knock out Pakistan's ability to mount a retaliatory strike. Even if the GHQ, or some other command and control centre, was 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 country's leadership, 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 zero¹.

I am sure that the same reasoning holds on the Indian side. To summarise the Indo-Pakistani scenario is in this regard really terrifying. The flight time for missiles is just a few minutes. If a computer mistakenly gives a signal that it has picked up an incoming rocket there is no time to check this out, no time to call the other side to verify. The only rational response is to retaliate immediately before your own bombs are destroyed on the ground.

The present scenario on the Indian subcontinent is really alarming and there is a clear danger of nuclear war. I can testify to this atmosphere as I have just returned from three weeks in Pakistan. Over the centuries the Indo-Gangetic plains have been the scenes of crucial battles between invaders from Central Asia and Indian rulers. These battles have determined the history of the subcontinent for centuries thereafter. India and Pakistan have converted these plains into a possible theatre of nuclear war. During the last three years, since the tests, both countries have moved rapidly towards weaponisation and deployment.

RECENT DEVELOPMENTS IN WEAPONISATION AND DEPLOYMENT

The Times of India of 11 May 2001, exactly to a day on the third anniversary of Pokhran II, reported that India had officially stated that it was going ahead with research, development and manufacture of the minimum number of nuclear weapons as dictated by its national security policy. (It is curious that nobody knows what this minimum number should be. A number like 150 is usually quoted but nothing is known officially). This work is being carried out at the Bhabha Atomic Research Centre (BARC) in Mumbai. The annual report (2000-2001) of the Department of Energy (DAE), which is responsible for BARC, says cryptically "BARC continued implementation of necessary research and development as well as manufacturing activities to meet the national policy of credible minimum nuclear deterrence." The report further revealed that work on a tera-watt laser is "progressing according to schedule" at the Centre for Advanced Technology (CAT) in Indore, another weapons laboratory under the DAE. One tera-watt equals a thousand billion watts and such high power lasers are used for simulating thermonuclear explosions in the laboratory. India's four-beam laser facility in Indore, built totally indigenously, puts it in a good position behind Russia's "super-laser" system code-named Delfin and before Israel's "Aladin". Of course the United States has the most advanced high power laser system. India is also working on particle beam weapons.

India has also developed several missiles of various ranges that could hit all the major cities in Pakistan. It has also announced its draft nuclear doctrine, which is based on a credible minimum nuclear deterrence. It has yet to define what it means by

¹ P. Hoodbhoy, *Accidental Pakistan-India Nuclear War Impossible?*, in Background Material, "Nuclear Issues Workshop", Lahore, Pakistan, December 19, 1998, Mashal Books, Lahore, Pakistan, 1999.

minimum. This nuclear deterrence will be based on a triad of launch platforms, a strategic bomber force, a missile force and submarine launched nuclear weapons. It is known that nuclear-armed missiles have already been put into operation and also that aircraft carried nuclear weapons have been deployed. Submarine launched nuclear bombs are still some time away. The myth of deterrence that nuclear weapons will not be used in a war between India and Pakistan suffered a further blow with the just concluded Poorna Vijay (Total Victory) joint Indian army and air force exercises held in Rajasthan on the Pakistan border. These war games show that a limited war with Pakistan is not ruled out and that nuclear weapons will be used in such a "limited" war. They also show that weaponisation is complete on the Indian side. The exercise establishes that if and when there is another Indo-Pakistan war, it is expected to see a nuclear exchange. It is clear that India has both inducted and deployed nuclear weapons. Why else would the Indian Air Force create a nuclear war battlefield in the exercises? The only difference was that they dropped dummy bombs instead of real nuclear bombs. The Defence Ministry said that these exercises had tested "unmanned aerial delivery vehicles" and the "Indian forces' capability at nuclear warfare". In these exercises Indian soldiers were being trained to carry on offensive operations despite a Pakistani nuclear attack. Clearly Pakistan will also now conduct such an exercise. In fact on May 10th Pakistan announced that its armed forces would stage massive nuclear war games in the coming weeks. During the military exercises the armed forces will be trained about tactical manoeuvres in a nuclear or chemical conflict. The priority will be given to surviving a nuclear or chemical attack and then how to respond to such an attack. Thus deterrence is a dead duck and what is in prospect is war, with or without the use of nuclear weapons.

What is the status of Pakistan's security? With a collapsing economy, a disastrous political system and rapidly growing poverty they are obviously more insecure than ever. The only hope - not supported by the evidence - lies in India being actually deterred, though by the recent exercise, it is trying to show that it is not. What happens when deterrence fails? Pakistan will make one or two nuclear strikes, on the battlefield and also necessarily on India's cities for maximum effect. What happens next? Not knowing Pakistan's intentions, India will retaliate massively in kind. Clearly there is no defence against nuclear weapons. Thus Pakistan runs the risk of having all its major six or seven big cities wiped out. Civilised, even coherent, physical activities will cease. Nobody would care what happened to the original war.

Although Pakistan cannot match India, I know from personal contacts in Pakistan that it is going along the same road with research, development and manufacture of nuclear weapons. The most significant development in Pakistan is the enormous amount of resources being spent on missile development and manufacture. According to US intelligence sources China is helping Pakistan in its nuclear missile programme. A new corporation, the National Defence Corporation, has been set up to develop new weapons, in particular rockets of all types and ranges. Pakistan has already tested several missiles, one of which has a range of about 1500 kilometres, enough to bring many Indian cities under threat. It is putting much effort into making these rockets accurate and is developing quite sophisticated guidance systems. According to some defence analysts in the West, Pakistan's nuclear missile programme is far superior to India's. Although it cannot match India, Pakistan is clearly determined to continue on its own road of maintaining its own "minimum nuclear deterrence". Pakistan's missile defence programme is also very much influenced by the war in Serbia. There it was shown that air power, although it did not harm the Yugoslav Army, could cause sufficient damage to civilian infrastructure so as to make the enemy withdraw. Ground

troops were not necessary. Modern fighter and bomber aircraft are too expensive and missiles are the poor nation's substitute for bombing from afar without using ground troops. The Russians also used this technique in Grozny, also bombing from afar with artillery and tanks. In all such cases of course civilian casualties are very high.

Another myth about deterrence has also been exploded and that is the so-called peace dividend. According to this both the countries could go safely openly nuclear and hence there would be no chance of war and they could reap the benefit of the peace dividend, meaning that they could cut spending on conventional weapons. Both Indian and Pakistani strategists were of the opinion that there would be no war due to the deterrent value of these weapons and behind this shield they could reduce their ruinously expensive conventional forces. Nothing has been farther from the truth. War has already taken place and both countries have increased their expenditures on conventional weapons. In 1998 the percentage of defence spending as a share of the central government expenditures for India was approximately 13 per cent. This is against the background where half the government revenue is spent on paying back existing loans. Following the Pokhran II tests the Indian defence budget rose sharply by 28 per cent in 1999, again by 14 per cent in 2000, even as spending on the social sector declined or stagnated. For Pakistan the situation is even worse, where the percentage of defence spending as a share of the federal government expenditure is about 30 per cent, more than double that of India. This is an economy in which two thirds of government expenditures are devoted to defence and debt servicing. Pakistan is surviving basically on borrowing. It is amazing how two of the poorest nations of the world, suffering from illusions of grandeur, are bent upon committing suicide.

THE INTERNATIONAL CONTEXT

Now I would like to turn to the international context of the nuclearisation of South Asia. The first is the question of Kosovo. I believe that the NATO assault on Yugoslavia in the guise of a just war, ignoring the United Nations and violating its own founding objectives in the name of "humanitarian interference" has set back the general aim of worldwide disarmament by decades. In particular it has sent the wrong kind of signals to Indian, Russian and Chinese military planners and defence strategists. After the collapse of the Soviet Union and the Warsaw Pact, NATO lost its *raison d'être*, given that Western Europe and the United States were no longer threatened by an invasion from Eastern Europe. NATO thus had the choice between disbanding itself and developing a new reason for its existence. This gave the opportunity to the United States to reshape NATO in ways that would serve its new national interests. It is very important to remember that its founding documents (Article 5 of the Treaty of 4 April 1949) clearly say that NATO was a defensive organisation, which would go into action only when one of its member states was attacked. This was clearly not the case with Yugoslavia. One of the aims of the United States in attacking Yugoslavia at that time on the pretext of preventing ethnic cleansing in Kosovo was to present to the European states a *fait accompli*; an example of the future role of NATO as an offensive organisation whose aim was to act as the world policeman in the defence of perceived United States interests. It was clear that the US was intent on provoking a war with Yugoslavia and its subsequent bombardment. To achieve this the famous Racak "massacre" of Albanians by Serb forces was invented and which in fact never took place and the well-known farce at Rambouillet was played out.

The changed nature of NATO was consecrated at the NATO heads of state meeting on 24 April 1999. This committed the member countries also to conduct operations outside the territory of the Alliance (non-Article 5 operations). Article 31 of the document "The Alliance's Strategic Concept" approved by the Heads of State on April 24 1999 says:

“NATO will seek, in co-operation with other organisations, to prevent conflict, or should a crisis arise, to contribute to its effective management, consistent with international law, including through the possibility of conducting non-Article 5 crisis response operations”.

To remove any doubt about the intentions of NATO, President Clinton clarified, during the press conference on 24 April 1999, that the North Atlantic Allies

“have reaffirmed their readiness to affront in appropriate circumstance, regional conflicts beyond the territory of the members of NATO”.

In other words, NATO intends to project its military force beyond its borders not only in Europe, but also other regions, like the Middle East, Africa and the Indian Ocean. NATO has given itself the right to intervene anywhere in the world and this without any discussion in any of the so-called left of centre parliaments of Europe! Led by the biggest and most dangerous rogue state, the United States, NATO is set to become the gravest threat to peace in the world. The declared aim of US strategy is not to tolerate the existence of any power capable of resisting the orders of Washington and in consequence to dismantle all those countries considered 'too big' and to create the maximum number of puppet states. The actions of NATO in Serbia, the daily illegal and immoral bombing of Iraq by the criminal states of the US and UK, the criminal bombing of a medical factory in Sudan, etc. have contributed to creating in the eyes of billions of people of the poorest countries of the world the image of the arrogant, richest and most powerful countries of the West using all their power, their riches and the most sophisticated technology to destroy poor weak countries of a few million people.

Why have I gone through all this? Does it have a bearing on what we are here to discuss? Definitely so. Unless the US gives up its dream of world domination one can forget about a nuclear free South Asia or an end to nuclear tension between India and Pakistan. The assault on Serbia to enforce 'human rights' is being forth as the model for the future. Consequently defence spending in Europe will have to increase. Armed intervention in the name of 'superior moral positions', war in the name of 'humanitarian intervention' and consequently, rearming of Europe and the United States (which by the way never stopped rearming itself to the teeth). This is the scenario that confronts Russian, Chinese and Indian strategic and defence planners and unless they are fools they must have drawn the necessary conclusions. What message will India, Pakistan, Iraq, Iran, Libya, Israel, Egypt, Brazil, etc. have drawn from all this? Is it not obvious? If you have nuclear weapons, keep them; if not get them. Who would have suggested bombing Belgrade if Milosevic had possessed nuclear weapons? In fact the Indian government, on the first anniversary of its nuclear test, used the NATO assault on Yugoslavia to justify its own attempt to develop nuclear weapons: "in a world where NATO can attack a sovereign state with impunity - our search for security is more than justified". In the long run Indian and US interests are bound to clash in the Indian Ocean region, which India regards as its own and I am sure that India is planning for this eventuality.

Recent events with the arrival of Bush have made it even more impossible for a nuclear stand down in South Asia. Already at the time of Kosovo both Russia and China had to rethink their strategies *vis-a-vis* the aggressiveness of the United States. Given its conventional weapon inferiority the Russians in 1999 soon went back from their no-first-strike policy, which had been in place for decades. Now in case of losing a conventional war the Russians reserve the right to use tactical nuclear weapons. They have also started to manufacture new tactical nuclear weapons. China also started to strengthen its military and increased its military spending.

With Bush becoming president the situation has become much worse. His proposal to reactivate the star wars scenario with the National Missile Defence (NMD) will have disastrous consequences on my part of the world. Of course we know that it cannot work specially against the Russians who will do all they can to make it unworkable by using decoys, saturation, etc. If the US abrogates the ABM treaty, as Bush is threatening to do, there is every likelihood that Russia will retaliate by scrapping existing arms control agreements such as the 1987 Intermediate Nuclear Forces treaty and the subsequent START (Strategic Arms Reduction Treaty) - I and II agreements leading to a new arms race. The so-called rogue states will also be tempted to build more missiles so that at least one or two could get through.

But what concerns me here is the response of the Chinese to this and to the specific Chinese targeted Theatre Missile Defence (TMD). Although the US government is trying to reassure China that NMD is not a threat to China but that it is aimed against so-called rogue states, the Chinese know very well that once NMD is in place then their limited strategic arsenal (about 20 missiles that can reach the US mainland) will become ineffective. China too has threatened to open up all existing arms control measures and review its own (largely defensive) strategic doctrine in case the US goes ahead with NMD/TMD. To counteract this they will build many more intercontinental nuclear missiles to overwhelm US defences. India will perceive this development as a threat to itself and hence will also increase its own nuclear weaponry. This in turn will lead to Pakistan constructing more nuclear weapons. Thus the deployment of the NMD opens up a dangerous scenario with an open ended and accelerating arms race in Asia.

This is why I do not understand India officially welcoming the NMD. It seems to me that India has abandoned all its previous principled positions for short-term gains from the US. It is proposing itself as the strategic partner for the US in the region. What it hopes to gain is big power respectability, the lifting of sanctions, which were imposed after the 1998 tests (in fact it is believed that the sanctions will be lifted in the next three to six months), and possibly realignment of the US policy on Kashmir towards recognising the line of control as an international border. But what it is doing is giving respectability to a policy, which will lead to a more unstable world where even space will be militarised, as is the US proposal. NMD will not protect India from a Pakistani nuclear attack. India has given up its autonomous position and undermined its national security further. Its size, location and demography give it a distinct character and that is why it was non-aligned for so long. This autonomy was also the reason given for developing nuclear weapons. India's foreign minister Jaswant Singh toured world capitals justifying the Indian nuclear tests on the ground that India had to safeguard its strategic autonomy. Now it has reversed its position and has aligned itself closer to the US. As Praful Bidwai says:

Over the past two years, New Delhi has moved towards 'strategic partnership' with Washington and increasingly accepted America's agenda in security, economy, trade, environment, etc. New Delhi's uncritical endorsement of Bush's missile defence plan marks a new low in India's international vision and diplomacy. It means accepting the fraudulent argument about 'rogue states' such as Iran, Iraq and North Korea, 'threatening' the US.

India has traditionally rejected their categorisation as 'rogues' or 'states of concern'. It has normal diplomatic relations with all these countries and just upgraded its ties with Iran, besides signing a long-term oil agreement with Iraq.

Ironically, India's endorsement of missile defence will end up working against this country's own interests. Renewed competition for missile superiority, collapse of existing restraint regimes, and likely nuclear rearming by the major powers, are bound to damage global security and draw India into serious armed competition with China.

A Sino-Indian nuclear arms race will prove strategically and economically ruinous. India's military spending has doubled over the last five years, the largest increase since Independence (1947)².

I might add here that as I said above a China-India nuclear arms race will inevitably lead to an India-Pakistan arms race with disastrous consequences for Pakistan. This realignment of India is very dangerous. Russia its erstwhile main ally must surely be worried about this new turn in Indian foreign policy but the most important aspect is China's reaction. China is actively engaged in combating the NMD. China now sees India as a threatening US ally. Therefore China will attempt to counteract this by promoting its traditional good relations with Pakistan and will strengthen its military co-operation with Pakistan, including help in developing missiles. The diplomatic manoeuvres in India and Pakistan during the last couple of weeks were symptomatic of the new changed situation. While in New Delhi, the US Deputy Secretary of State, Richard Armitage, was busy convincing India of the virtues of the NMD, over in Islamabad China's Prime Minister, Zhu Rongji, was expressing its country's eternal friendship with Pakistan. Pakistan and China have pledged to deepen their friendship. This will be primarily an anti-American and anti-Indian alliance. Already we are seeing the dangerous fruits of the White House's "star wars".

I will conclude by saying that the situation in the sub-continent is critical. There is a real danger of nuclear war either by accident or because of a local limited war getting out of control. The future is dark and unless there is a change in the international situation and unless there is a satisfactory solution to the Kashmir problem the threat of nuclear annihilation is very present. I also feel that there can be no nuclear free South Asia as long as the United States continues to maintain its nuclear weapons and as long as it does not give up its desire for world domination. We live in dangerous times.

² Praful Bidwai, *Bush's 'Star Wars': India's abject capitulation*, Special to Tehelka.com, May 3, 2001.

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Faheem Hussain was born in India in 1942. Migrated to Pakistan in 1947. First degree in Physics in 1963 from the University of London and then Ph. D. in 1966 in Theoretical Physics from Imperial College, London, working in Prof. Abdus Salam's group. Research associate at the Enrico Fermi Institute, the University of Chicago, from 1966-1968. From 1968 to 1989, professor at the Quaid-i-Azam University, Islamabad. From 1989 to 1990 visiting professor at the Johannes-Gutenberg University, in Mainz, Germany. On leave of absence from Quaid-i-Azam University, for two years from 1977 to 1979, teaching at Garyounis University, Benghazi, Libya. Since 1990 working as a staff scientist at the Abdus Salam International Centre for Theoretical Physics, Trieste. Currently in charge of the Office of External Activities of the Centre. Research interests in Physics have always been in theoretical elementary particle physics. Presently working in superstring theory and the physics of extra dimensions. In the 60's active in the anti-nuclear movement in England and then in the anti Vietnam War movement in the United States. In Pakistan Faheem Hussain participated in the movement for democracy, in particular during the dictatorship of Gen Zia-ul-Haq. He is still an active member of the movement in Pakistan against nuclear weapons, for greater democratisation of the country and for peace between India and Pakistan. He still considers himself a communist. Now also an Italian citizen and takes an active interest in Italian politics.

Faheem Hussain è nato in India nel 1942. Emigrato in Pakistan nel 1947. Laurea di primo livello in Fisica nel 1963 all'Università di Londra e poi Dottorato di Ricerca in Fisica Teorica presso l'Imperial College di Londra, nel gruppo del prof. Abdus Salam. Ricercatore associato all'Istituto Enrico Fermi dell'Università di Chicago, dal 1966 al 1968. Dal 1968 al 1989, professore all'Università Quaid-i-Azam di Islamabad. Dal 1989 al 1990 professore ospite all'Università Johannes Gutenberg di Mainz, in Germania. In congedo dall'Università Quaid-i-Azam, per due anni, dal 1977 al 1979, ha insegnato all'Università Garyounis di Bengasi, in Libia. Dal 1990 lavora al Centro Internazionale di Fisica Teorica Abdus Salam di Trieste. Attualmente è responsabile dell'Ufficio Attività Esterne del Centro. I suoi interessi di ricerca in Fisica sono sempre stati nel campo della Fisica delle Particelle Elementari. Attualmente lavora sulla teoria delle superstringhe e sulla fisica a più dimensioni. Negli anni '60 è stato attivo nel movimento anti-nucleare in Inghilterra e poi nel movimento contro la Guerra del Vietnam negli Stati Uniti. In Pakistan Faheem Hussain ha partecipato al movimento per la democrazia, specialmente durante la dittatura del Gen. Zia-ul-Haq. È membro ancora attivo del movimento pakistano contro le armi nucleari, per una maggior democrazia nel paese e per la pace tra India e Pakistan. Si considera ancora un comunista. Ora è anche cittadino italiano e ha un interesse attivo nella politica italiana.

Riassunto

Esattamente tre anni fa, prima l'India e poi il Pakistan uscirono allo scoperto ed eseguirono alcuni test del loro armamento nucleare. Qual è la situazione ora? L'India è forse più sicura, adesso? Forse adesso il Pakistan è più sicuro? Il livello di sicurezza di uno stato aumenta con il possesso di armi nucleari? Queste sono le questioni che vorrei affrontare nel seminario.