A brief note on non-proliferation of nuclear weapons: Need to redefine agenda

The NPT is coming up for renewal in 1995. The focus of debate at this conjecture will undoubtedly be the refusal of some nations to sign the treaty, and ways and means to persuade them to do so this time around.

India is one of the nations which has not acquiesced to the NPT. It is also a nation which has demonstrated its capability to conduct a test nuclear explosion. Its weapons capability is unspecified, but it may be presumed that India is very close to achieving that capability.

Its policy of eschewing nuclear weapons, while retaining capability in all categories – production of weapons grade fissile material, developing short- and long-range systems which can be used for delivery, etc. – has been widely criticized as hypocritical. What we will argue here is that this policy of retaining capability while refraining from full-scale armament development and deployment is the minimal option open to its defence establishment.

There is a great deal of ambiguity in the discussion on nuclear matters in the media. Some of the ambiguity appears to be quite deliberate. To begin with, therefore, it is necessary to introduce some clarity and specificity into the terms of discourse.

Firstly, the term 'nuclear deterrence'. The same term is used to describe the deterrence policies of all the nuclear or potentially nuclear nations, as if the policies of all these nations were identical. In fact, there is an important, and crucial, difference in nuclear deterrence policies which needs to be highlighted.

Let us term as a policy of *non-initiatist nuclear deterrence* a policy of non-use of nuclear weapons except as a response to the first use of *nuclear weapons* by an adversary. This is to be distinguished from *initiatist nuclear deterrence*, a policy which permits the use of nuclear weapons as a response to conventional attack with conventional, non-nuclear weapons. These are two completely conceptually different deterrence postures. Of the nuclear-weapons possessing nations (NWPN), China and the USSR had adopted non-initiatist nuclear deterrence postures, while the USA, Britain and France have consistently refused to commit themselves to a non-initiatist deterrence posture. This difference has understandably been underplayed by a mass media dominated by NWPN media transnationals. However, it is too important a difference to be ignored by those serious about non-proliferation and disarmament.

The second point which needs to be clarified is the term 'use of nuclear weapons'. As was pointed out by Daniel Ellsberg, nuclear weapons can be used in two ways. First, they can be actually detonated over a target as happened at Hiroshima and Nagasaki. The other kind of use is like when a gun is used to point at somebody in order to give a threat. In the second sense, nuclear weapons have been used more than two dozen times after Hiroshima and Nagasaki. The declaration of a 'nuclear alert' by a nuclear power, the moving into a zone of nuclear weapons in a time of crisis – these are all ways in which nuclear weapons have been used in the second sense. 'Non-first-use' sometimes is taken to connote non-use in the first sense. Actually, 'non-use of NW' requires a more strict interpretation in excluding the second kind of use also.

The third point that we must be clear about is that there is no conventional defence against nuclear weapons. Faced with an adversary possessing NW, a nation has essentially three choices: accept the military hegemony of the adversary; develop a deterrent of its own, which is necessarily a nuclear deterrent; accept the nuclear umbrella of another nuclear power. It is argued that as far as India is concerned, its main adversary is Pakistan, and that the security needs of both the countries will be better served if both eschew nuclear weapons. Therefore, it is further argued that, if India is averse to signing the NPT because of its discriminatory provisions, both the countries can enter into a regional agreement to exclude nuclea: weapons. De facto, the end result will be the same – the closing of the nuclear option for both the countries.

India is unlikely to accept such an arrangement, because Pakistan is not its only adversary. Even if China is for the sake of argument excluded (China having given a guarantee of non-first-use), it is evident that the USA cannot be excluded as a potential adversary, as far as India is concerned.

Why? Briefly, because of the defence posture of the USA. The 'initiatist nuclear deterrence' posture of the USA envisages the use of nuclear weapons as a continuation and permissible escalation of a conventional engagement. In fact, recent research in the USA has been directed towards reducing the 'gap' between the conventional explosives and the nuclear weapons of the lowest power, ostensibly in order to enhance the 'credibility of the US nuclear deterrent'. Nuclear weapons have also been used against India by the USA in the second sense. As has been revealed by Richard Nixon in his memoirs, there was a threat of US nuclear intervention during the 1971 India–Pakistan war over Bangladesh. India's 1974 nuclear explosion was presumably a direct outcome of that episode.

Given current equations between the USA and India, Indian government spokesmen are unlikely to explicitly enunciate or highlight the above realities. But no serious analysis can ignore these realities. It is also clear to anyone familiar with the political scenario in South Asia, that there are a number of possible situations in which a military confrontation between the USA and India could occur in future. This could occur over Kashmir, or over sanctions arising out of differences on economic policy/USA investments if present policies are changed, to name just a couple. US defence policy formulations *vis-à-vis* the 'third world', which envisage a nuclear response to a conventional engagement, is yet another reason. In short, the USA has to be included in the list of NWPN potential adversary in any Indian defence assessment.

Since of the three options available to nations facing nuclear adversaries, two are politically unacceptable, the only politically acceptable option is to maintain a minimalist nuclear deterrent of one's own. It should be clear that unless there is a change in the US nuclear deterrence posture, there is no possibility of India

closing its nuclear option. In fact, its present policy of 'nuclear ambiguity' (a more accurate term would be nuclear abstinence) appears to be the minimal nuclear posture consistent with the adversarial scenarios facing Indian defence planners.

No effort at non-proliferation can succeed only on the wishes and good intentions of its proponents Any serious effort must take into consideration political realities, defence needs and public perceptions of these needs. Does this mean that non-proliferation is not possible today? No. It does mean that *non-proliferation will be possible only when the NWPN are all persuaded or pressurized to adopt minimal 'non-initiatist nuclear deterrence postures'*. An important corollary of the above analysis is that the condition precedent for a non-proliferation treaty is a preliminary treaty of a different kind: a 'nuclear non-initiation treaty' (NNIT). In such a treaty, each signatory agrees not to initiate in any way, the use, or the threat of use, of nuclear weapons.

Such a treaty would forbid the use, or a threat of the use of NW against non-nuclear nations. It must also be noted that immediately after such a treaty, all nuclear weapons of first use, including the so-called 'tactical nuclear weapons' would become redundant, and would have to be eliminated. These are precisely the most destabilizing weapons which have so far been excluded from agreements between the USA and USSR/Russia.

It is necessary to mobilize public opinion, especially opinion in the NWPN and potentially nuclear nations in favour of this enabling treaty. International pressure of the peace movement, of scientists, etc., must be directed towards making a NNIT as point number one on the international non-proliferation agenda, including the agenda of this conference/ workshop.

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SCIENTIFIC CORRESPONDENCE

Tea – A strong antioxidant

Tea leaves (*Camellia sinensis*), of the family Ternstroemiaceae, a popular beverage, is in use since centuries. As per ancient belief, it has stimulant and antisoporific action that elevates mood, decreases fatigue, increases the capacity to work and clears the flow of thoughts. In some societies, drinking tea has become a part of life[1]. The morning cup gives a feeling of well-being and increased performance. The people are more or less habituated to the same[2]. Because of dependency and side-effects of excess intake of tea and other xanthine beverages (coffee, cocoa, etc.), its use is discouraged by many people However, this report indicates its strong antioxidant and antilipid peroxidative properties and advocates its optimal use, which varies from individual to individual.

Tea leaves were boiled in water for 1–2 min as routinely prepared in the kitchen and cooled. The filtered extract exhibited concentration-dependent inhibition of lipid peroxidation (measured as thiobarbituric acid reactive products) in rat liver homogenate incubated with either enzymatic (ADP-complexed iron) or non-enzymatic ($FeSO_4$) radical-producing system[3,4] (Table 1) In brief, 5% liver homogenate was incubated with tea liquire for 20 min in 35 mm Petri dishes. Thereafter, lipid peroxidation was induced by adding different agents. After 20 min, 0.1 ml of incubation mixture was taken to estimate MDA by using thiobarbituric acid and absorbance was recorded at 535 nm as reported by us earlier[5,6]. Tea liquire of different concentrations ranging from 0 6 g/100 ml to 5 g/100 ml were prepared and tested. Tea exhibited dose-dependent protection. It also maintained the level of reduced glutathione content, which was measured at 412 nm by using 0.01% DTNB[7], and checked the ongoing lipid peroxidation process (data not shown).

Thus, it appears that besides other reported activities of stimulation[8], tea is a strong inhibitor of lipid peroxidation induced by free radicals. This observation is supported by the previous observations that caffeine is anti-inflammatory and it interferes with the synthesis of prostaglandins[9]. Besides methyl xanthine, there are several compounds such as carotene, nicotinic acid, kaempferol, quercetin, myricetin, flavonols, inositol, polyphenols, chlorogenic acid, etc., which are present in tea and have been found to be antioxidant[10]. On comparison with known antioxidants like parabenzoquinone and vitamin E, tea is found to be significantly active (Table 2). ED_{50} for all the three agents are determined by using the dose–response curves for these agents under

Table 1. Protective effect of tea against induced lipid peroxidation

Dose of tea (mg/ml)	Conc. of liquire (g/100 ml)	TBARS (nm/100 mg protein) mean ± SD	
		$FeSO_4$	ADP–iron
0 00	0.00	474 98 ± 9 60	480 67 ± 9 30
0 05	0 60	438 00 ± 9 96	421 02 ± 9 60
0 13	1 60	372 59 ± 8 98	357 21 ± 7 92
0 27	3 30	250 29 ± 9 66	245 14 ± 8 65
0 41	5 00	193 40 ± 8 86	177 84 ± 5 50

$FeSO_4$ = 4 mM
ADP-complexed iron = 1 6 mM ADP + 62 µM $FeCl_3$