And what about global denuclearization?

It is high time the selective implementation of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) is effectively challenged. The overwhelming majority of nations that participated in the formulation of the 1968 Treaty while doing so had also in mind the goal of total elimination of nuclear weapons from the world. The object of global nuclear disarmament under international control, through negotiations, is explicitly stated in the preamble as well as the operational article VI of NPT.

The obvious injustice contained in the Treaty that countries that had developed nuclear weapons before 1967 alone can have such weapons was tolerated by the non-weapon states on account of the provision that total elimination of nuclear weapons would be pursued as a critical goal of the Treaty, despite not having an assurance that the nuclear Parties would not use these weapons against others. This is the only multilateral treaty developed in the post-colonial period that replicated the anti-democratic veto power of the same five countries in the UN Security Council in the decision making of the Conference of Parties on amendments to the Treaty's text.

The second half of the past decade witnessed some diplomatic initiatives to set the course for implementing Article VI of NPT, despite resistance from some nuclear States. In agreeing to indefinitely extend the Treaty at the 1995 Review Conference, the developing world had hoped to seek the implementation of Article VI for removing the frightening prospect of another Hiroshima or Nagasaki. In a landmark verdict in 1996 the International Court of Justice (ICJ) opined that the threat of use or use of nuclear weapons was illegal and called upon the Parties to NPT to fulfil their obligation for the elimination of nuclear weapons. This entire process and its fallouts, though sidelined by the western corporate-media, have been benefited by an intense campaign by civil society organization.

Following the ICJ verdict, the General Assembly adopted a resolution in 1997 calling for the development of a Nuclear Weapons Convention to eliminate nuclear weapons. Regretting the progress in implementing this 1997 resolution, the General Assembly passed a follow-up resolution in 1999, again by an overwhelming majority, which called upon States to commence negotiations on the Nuclear Weapons Convention in 2000.

This momentum has, however, been lost in the subsequent years. India's own abandonment of its legacy as a long time campaigner of global denuclearization is symptomatic of the metamorphosis of the country's ruling elite.

Selective implementation of the grossly discriminatory NPT stands against the spirit of even this skewed treaty, and has turned the world into a dangerous place. Countries that have stockpiled enough weapons in their arsenal to destroy the world a dozen times cannot lecture down to countries in the developing world on the virtues of abandoning their real or imaginary nuclear programmes, though such programmes in themselves are an unadulterated obscenity in countries plagued by poverty.

The world, however, cannot wait for too long to eliminate these horrendous weapons of mass destruction. A people's movement cutting across national boundaries alone can force the recalcitrant nations to begin negotiations on the Nuclear Weapons Convention. As the essential first step the nuclear-weapon Parties should, as demanded by the Non-Aligned Movement, provide legally binding assurance to the non-weapon Parties that these weapons would not be used against them.

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Origin of hepatitis C virus

Jumping of viruses from one host to another is an explanation for emergence of viruses previously not documented in the new host. Of course, availability and development of advanced sensitive technologies aid in the discovery of the previously undiscovered viruses. Such jumping of viruses from host to host is a consequence of any of the following:

(i) The virus previously did not get a chance to infect the new host – this happens in situations wherein sylvatic animals get in contact with domestic animals or humans – Hantavirus, Filoviruses like Ebola virus, etc. are examples.

(ii) Sometimes a known virus is present in the new host that might serve as a reservoir or as a carrier, but takes time to adapt to the new host. In this process of adaptation, a mutant evolves into a new virus causing an entirely new disease. Once such a virus emerges, it spreads rapidly as the new immunologically naïve host is present in abundant numbers. For this kind of emergence to occur, the known host should also be in constant contact with the new host. Shifting of host range of Canine Parvovirus (CPV) in dogs is one classic example here[1].

Fitting into this explanation of emerging viruses is the hepatitis C virus (HCV), which can be considered as having evolved from the Bovine Viral Diarrhoea Virus (BVDV). Partial scientific evidence for this comes from the studies of Bukh *et al.*[2] and Yanagi *et al.*[3]. In both these studies, the authors were able to amplify the BVDV genome using primers designed for HCV. Furthermore, Yanagi *et al.*[3] state that the foetal bovine sera (FBS) supplied by various manufacturers are contaminated by BVDV. Usage of FBS as a universal supplement in cell culture media of human/animal cell cultures, might have given BVDV an opportunity to infect human cells. Over a period, a novel mutant may have resulted in the evolution of HCV. Instances of accidental exposures are documented in the scientific literature[4]. Additionally, usage of bovine products by humans since time immemorial, gave an opportunity for BVDV to adapt to the new host.

Yet another theory for evolution of viruses states that they might have evolved endogenously in the host animals[5]. This means that fragments of nucleic acids

formed fortuitously may have acquired the capability to self-replicate, get encapsulated with the protein and in certain cases, envelope themselves by budding-off the host cell membrane and infect new cells. Viruses that evolved in this manner have restricted modes of transmission, as observed in HCV. Transmission through the respiratory route perhaps represents the most evolved among viruses, e.g. influenza viruses. Thus, by this explanation, HCV and other viruses that require help for transmission, represent the most primitive of all, while those that do not (as in influenza viruses), the most advanced.

Partial scientific evidence for the latter hypothesis of origin of HCV comes from the findings of Weber *et al.*[6], wherein unexplained sequence similarities between a number of viruses, including HCV, and human ESTs were documented. More recently, molecular mimicry and sequence similarity with the human genome was documented by Yu-wen Hu *et al.*[7], which might also explain the autoimmunity observed in some cases of this viral infection. Perhaps from the pathogen perspective, such autoimmunity, apart from serving as a survival strategy, is also possibly: (i) a step in the process of adapting to the new host (when considered along with the first hypothesis of host jumping) and (ii) a better proof of the fact that the virus is endogenously evolved. Additionally, the possibility of HCV being a bio-warfare agent cannot be ruled out completely.

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Rediscovery of an endemic and endangered plant (*Begonia tessaricarpa* C.B. Clarke) from Arunachal Pradesh, India, after a century

Arunachal Pradesh is considered to be luxuriant in floral diversity and has been recognized as the 25th biodiversity hotspot in the world[1]. During floristic exploration under Flora of Upper Subansiri District, an interesting *Begonia* species (Figure 1) was collected. After a critical examination and comparison with the original description and the type specimen available at the BSI herbarium, CAL, its identity has been confirmed as *Begonia tessaricarpa* C. B. Clarke[2] and the voucher specimen is deposited in the BSI herbarium, ARUN. The plant was first described by C. B. Clarke[3] in 1879 and again in 1890 on the basis of a single specimen collected by Griffith (Kew Distrib. No. 2586). The described holotype was from 'Assam', without giving precise locality. Since then, it has not been reported so far throughout the last century and no specimen is found deposited in the major BSI herbaria, viz. CAL, ASSAM and ARUN. The species is treated under intermediate category in the *Red Data Book*[4] and IUCN 1997 publication of threatened plants[5]. Relocation of the habitat has been a necessary task for the protection of this plant from extinction.

Begonia tessaricarpa C. B. Clarke in Hook, f. *Flora of British India*, **2**, 636. 1879; *J. Linn. Soc.*, **18**, 115.t.2. 1880. Kumar & Bhattacharya in Nair & Sastry (eds), *Red Data Book*, **3**, 85. 1990.

Acaulescent herb, 15–30 cm high, succulent; rootstock tuberous; rhizome creeping, abbreviated. Leaves 7.5–13.5 × 3.7 to 7.8 cm, pubescent on the nerves beneath, base oblique, ovate–cordate, apex acute–acuminate, margin sinuate–denticulate; stipules 0.6–0.8 × 0.3–0.5 cm ovate, pubescent, persistent. Inflorescence biparous cymes; scape 10–13.5 cm. Male flowers: sepals two obovate, glabrous; petals two, much smaller than the petals, lanceolate; stamens numerous, monoadelphous, anthers obovoid, connective slightly produced, obtuse. Female flower: ovary four-celled, pubescent, placentae bifid, styles four, joined half way up and divided and contorted at the apex, stigmas

Figure 1. *Begonia tessaricarpa* in natural habitat.