Science and Technology for Peace and Development

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Dr. Nagai, Ladies and Gentlemen,

I am most happy to see how many have responded to our invitation to this Tokyo Seminar - let me welcome you all to the United Nations University on behalf of my colleagues. It is a great honour and pleasure for us to convene what we believe to be a most important three days of discussion on the grave issue of whether and how modern science and technology can be made to serve the cause of peace more effectively than they do now.

I must open my remarks on a sad note - in paying tribute to the man who was to have chaired our meetings, Aurelio Peccei. He was a man unafraid of big visions who saw with great clarity the myriad of intimate interconnections that weave together the human condition. He showed that in this complex world, with its many competing pressures on the world's communications media, it is still possible for one man to break through the welter and fog of media events and be heard - and make a difference. He was with us at the last Tokyo Seminar in October 1982 and I know he was very much looking forward to attending this one. We will all miss him.

I see our task here essentially as trying to improve understanding of the linkages we need to make between science and technology and the worldwide yearning for peace. We must set about doing so within the context of the present world crisis and the longer-run process of global transformation that is such a distinctive hallmark of our time. I need not analyse the specifics of that crisis for this audience. We are all only too familiar with its elements: the loss of control over the arms race, the global economic disarray, the drift into international chaos, the fragmentation of power - all leading to increased feelings of insecurity and vulnerability. One great paradox of our age is that, though we have never before seen such an accumulation of scientific and technological power, at the same time there has never before been so strong a feeling of powerlessness in the face of on-rushing events. The unprecedented power that humankind has managed to achieve has not been accompanied by a commensurate increase in its understanding, its empathy, or its ability wisely to manage such power.

Interaction between global and regional struggles for influence is illustrated clearly by the historical fact that once a rough nuclear parity between the two superpowers was achieved in the 1960s, the United States

moved to reopen relations with China. And generally it can be said that the various regions of the world assumed new relevance in the calculus of the global balance of power. Shifts in the strategic balances in one, either real or perceived, inevitably lead to corresponding shifts in another region. Mutual interpenetrations of the traditional domains of the powers took place in several parts of the world, for example in Central America, Southern Africa, in all the world's oceans and also here in Asia. No region or sub-region here in Asia can any longer be securely claimed as the exclusive area of interest of one major power. Adjustment to these new facts of geo-politics has been deeply unsettling, adding to the sense of threat and instability.

The Third World now finds that the combination of major power rivalries and increasingly sophisticated weaponry has in many cases disassociated military capability from national industrial capacities. Few of the developing countries have full-fledged arms industries capable of producing highly sophisticated weapons. For most, an arms race means a high import bill and corresponding dependence on the industrial states: in 1979, the value of weapons imported by the developing countries was over $16 billion.

All of this has tremendous consequence for development and the character of society in the Third World countries. One debilitating effect is that national security becomes completely divorced from any development of their industrial capacities. Meiji Japan was able to turn a military build-up into an engine of industrial growth, under the banner of "rich country, strong military" (fukoku kyohei). This would be highly improbable in the Third World today.

I think it is most important that the developing countries begin to explore and examine non-military responses to questions of security. For they need not turn automatically to military hardware in attempting to reduce strife and violence. These are due in many instances to deep-seated grievances and differences which could be dealt with much more viably and permanently through diplomatic, economic or social measures.

This emphasizes the need, however, for the Third World to develop the research capacity to define our own security needs in our own terms, and not only in terms of major powers' interests - and to define how these needs could be in large part met through non-military responses. We also need to develop the ability to discriminate among the kinds of newly available military hardware to judge whether it has any real relevance to our security needs, or on the contrary simply has the effect of ratcheting up local arms races another notch. More broadly, we need a thorough reassessment of the very concept of security; a reassessment that will lead us, I expect, to an explicit recognition of the fact that national security is not just a military matter, but also depends on the growth of an equitable and just civil society.

We must recognize the impact that militarization can have on science and technology, causing a distortion in the allocation of resources for research and development. This tends to narrow the options for solutions to both socio-economic and national security problems. When the military definition of needs becomes the lead factor in R&D, other needs and other possible

solutions are increasingly ignored. Attention is only paid to the latest military hardware when what is really needed is research and thought about developing the social architecture for conflict resolution and the structural change necessary for development.

One very important security area on which I believe research and development in the Third World should be focused is the question of regional co-operation for security and development - based, for example, on confidence-building measures, on regional dispersal of arms-production capabilities, on co-production of arms, and on sharing of information about military planning and strategic assessments. Another source of intra-regional tensions could be tamped down if nuclear power facilities were jointly operated or at least opened to joint oversight.

It is interesting, with respect to Asia, to consider the role that Japan might play in helping to develop regional arrangements for security and development. With its capacity for satellite launching, Japan could, among other things, help greatly in building up a verification ability for any regional peace-keeping effort.

I have further suggested on previous occasions that Japan might play an even wider role in the global quest for peace by making a satellite available to the peace-keeping efforts of the United Nations as a contribution to its planned space-based system of communications and surveillance. This would be an unequivocal statement of Japan's commitment to peace and establish her as an international leader in peace.

Such an act would put Japan into the space age in a peaceful manner at a time when the superpowers are moving into space increasingly in a military manner. The militarization of space has profound implications for the global balance of power. We have already witnessed, in various trouble spots around the world, how satellite surveillance by the superpowers can affect the course of action on the ground. Thus Japan's "Satellite for Peace" might provide some sort of counterbalance, at least in a moral or ethical sense, to the military Big Brothers in the sky.

The task of this seminar is to examine how science and technology might best serve the cause of peace. Let us not be naive in approaching that task. The use of science and technology for military purposes fundamentally affects the shape and texture of society at large. The attempt to control science and make it serve peaceful uses is not just a matter of political will . It must be recognized just how profoundly military technology can alter and distort the development of societies and social institutions.

Certainly history demonstrates this - and suggests fruitful areas for our research. One sees important changes in weapons systems, due to technical discoveries, that changed conditions of warfare and helped bring about far-reaching social and political change.

Consider for example the chain of military developments and counter-developments that led to Europe's global imperialism in the eighteenth

and nineteenth centuries - the legacy of which still impedes the development efforts in much of the Third World. To counter the devastating impact of new and more powerful cannonry, sixteenth century Italian military engineers devised a fortification system which tipped the balance of power to the defence of strong sovereign states and impeded the political consolidation of Europe into a few large empires. This set afoot an arms race among the individual European states, all eagerly pursuing improved weaponry, which subsequently was used, with deadly effect, in subduing and colonizing the peoples in much of what is now the developing world.

Examples like this emphasize the importance of increasing our understanding of how the interests of the military and society at large can become interwoven. This leads inevitably to questions about the sort of global society we are today, with more than 500,000 scientists in the world now engaged in war-related research, 25 million people in the world's armed forces and another 10 million in paramilitary forces.

Also lending urgency to our present study of the interlinkages of war, science and technology is the quantum jump in the world's destructive capacities that has resulted from the new sophistication in weaponry.

In the very understandable emotional response to the destructive potential of nuclear war, one can lose sight of the fact of the lethal capabilities of today's increasingly deadly conventional weapons. Whether nuclear or non-nuclear, it is clear that we have now attained a military technological proficiency where any distinction between victor and vanquished is virtually obliterated.

Another vanished distinction needs to be added here: the distinction of being merely a bystander. This has been made most tellingly clear in the publication last fall of the scientific evidence on the probabilities of a "nuclear winter" following even a limited nuclear exchange. The United Nations University was one of the co-sponsors of the conference at which this new evidence was aired.

We have a paper by Professor Wolfendale presenting greater detail on the "nuclear winter" scenario. I would only like to make the observation that its findings make very clear that the South would also be a victim in such an exchange. It points to the need for new negotiating formulae in settings which provide for the appropriate participation of the non-nuclear states, since they too would be directly and devastatingly affected by a nuclear exchange. The stakes are just too high to allow the fate of the world to be determined by the superpowers alone.

A very much allied concern here is the issue of nuclear proliferation. Our consideration of this question at this seminar is particularly timely because of the impending review of the Non-Proliferation Treaty. The treaty was predicated on the assumption that the nuclear powers would take seriously the matter of arms control and disarmament - in other words, that an attempt to limit vertical proliferation in the nuclear club would accompany the restraint of the treaty signatories in horizontal proliferation. The almost

total lack of progress in this respect has undermined the moral basis of the Non-Proliferation Treaty. It is time for the non-nuclear states to take the initiative in devising new constraints on proliferation. One such initiative would be the establishment of additional nuclear-weapons-free zones. It is worth noting here that Japan was the first country to declare itself a nuclear-weapons-free zone.

However, in assigning the Third World the role of bystander in a nuclear exchange, I by no means wish to ignore the destruction of human life which has occurred there through use of conventional weapons. Since the Second World War, about 150 wars have been fought by such means, and virtually all have been waged in the Third World. Many of these, of course, have involved rival superpower interests, but I believe, speaking as one from the Third World, that we need to keep in mind just how much we have warred among ourselves.

Here we very much need to elucidate the role of military technology in helping spread tendencies for violence in the newly-independent states. In today's world of shifting allegiances and power patterns, the right of a nation to seek military security is, of course, undeniable. The challenge that has, as yet, eluded our grasp is how to achieve security without militarization. The development process itself inevitably produces tensions arising from uneven patterns of growth; we must be able to cope with these tensions in a more peaceful fashion, without the militarization of societies which we are witnessing so frequently in the Third World.

Underlying all of these issues is the much deeper question of how to encourage the scientific endeavour itself while diverting it to serve more fully the cause of peace. Tighter control of research would be one answer, but accepting such a move would inevitably threaten the creative process and in the end, paralyze the scientific endeavour itself.

The other route, which I think has far greater viability, is that of openness. Secrecy, in the long human endeavour to understand itself better, has proved to be counter-productive; intellect and innovation flourish best in the open air. There are very clear linkages and relationships between secrecy, which is a hallmark of military R&D, and the continuing momentum of the arms race. It is essential that we keep scientific research open and transparent to the public view, for two reasons: first, so that the non-scientist, from whatever background, might be able to pose ethical questions about work being done; second, so that adversary nations will not harbour dark fears about the super-weapons that their enemies may be developing under the veil of secrecy, and be tempted to lash out at shadows.

A major challenge that I would pose to the participants in this Tokyo Seminar is how the United Nations University might attempt to link scientific research to the profound and sometime inchoate yearning around the world for relief from nuclear terror and from the chaos and suffering of conventional war and domestic strife and violence. How can we respond to the loud and clear imperative we are hearing from so many voices today: find someway to

live without the constant threat of death, destruction, and violation of the human person, his spirit, and his dignity.

This message is being sent particularly by the young who exist with a constant, gnawing doubt about whether or not they will live out their natural life spans. We are therefore - at the United Nations University and specifically at this seminar - confronted with this dilemma: How to bring the necessary intellectual rigour and pragmatism to our studies of peace in ways that are consonant with the deeply expressed desire for peace heard round the world.

One thing is clear. It is not enough to rely on moral suasion, or even on iron-clad logic for ending the nuclear arms race. Both suasion and logic have been there, and obvious, for several decades - pointing to the fact that a nuclear war would accomplish little except obliteration of all our dreams of a better encampment of the human race in the twenty-first century. But this has not stopped the madness.

What the United Nations University therefore must take up, in its studies of peace, science and technology is the question of how we can bridge this gap between the need for serious and rigorous research and the yearning of the common citizen for peace, development and welfare. The central problem we are examining here is to employ science and technology in ways that do not destroy peace but rather enhance the capacity for social change that is so necessary to remedy endemic poverty and injustice. The survival and welfare of hundreds of millions around hangs on our ability to use science and technology in this peaceful manner. I would like to think that the UNU might here contribute to building an edifice of hope buttressed by reason - a reason inspired and pushed, in turn, by the aspirations of the human community.

In the great cathedrals of medieval Europe, the mounting glories of stained glass and delicately carved stone could not stand alone, but had to be supported by strong buttresses of stone. At first, these were solid lateral walls of rock. But when stonemasons mastered the technology of the pointed arch, the buttress was liberated from its mass and became, itself, a thing of beauty. I think we in our academic endeavour could seek some similar achievement - to solidly support the glorious edifice of human hope and aspiration, with scientific and moral reasoning that has the same instrinsic strength and stability, and even beauty, as the flying buttress. This is a tremendous challenge - but let us make a start.

Thank you very much.

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