Professor H. Yukawa

Pugwash

1975

Final Program

Aug. 28.

~ Sept. 1.

25th Pugwash Symposium

Notice No.1

1) Secretariat

a) On August 27th and in the evenings from August 28th to September 1st:
Room No.617, Kyoto Hotel

b) In the daytime from August 28th to September 1st:
in the Kyoto International Conference Hall.

2) Registration : August 27th
From 8.30 a.m. to 9.00 p.m. at the lobby on the 1st floor at Kyoto Hotel.
After 9.00 p.m. at Room No. 617, Kyoto Hotel.

3)

a) Breakfast: at Kyoto Hotel,
Main Dining Room (from 7.00 a.m. to 10.00 a.m.)
or
Japanese Restaurant (from 7.00 a.m. to 9.30 a.m.)

b) Lunch : at Kyoto International Conference Hall,
Dining Room (from 0.30 p.m.)

c) Dinner (Table d'hote): at Kyoto Hotel,
Main Dining Room (from 6.00 p.m. to 8.30 p.m.)
or
Japanese Restaurant (from 6.00 p.m. to 9.00 p.m.)

4) The bus for Kyoto International Conference Hall leaves Kyoto Hotel at 8.50 a.m. each morning.

5) Further information will be distributed in the pigeon-holes in the Secretariat at the Kyoto International Conference Hall.

Enclosed

1. Name Plate
2. Tentative Schedule
3. Map of the Kyoto International Conference Hall
4. Notice No.1
5. Invitation to the Reception offered by the Mayor of Kyoto City
~~6. Invitation to the dinner offered by Dr. and Mrs. H.Yukawa~~
7. Paper by K. Janouch
~~8. Paper by Y. Sakamoto~~ 仟
9. Questionnaire
10. Paper pad
11. Ball-point pen
12. Monthly Guide of Kyoto

(1)

Opening Address

August 28, 1975

Hideki Yukawa

I have been ill and in the hospital since May of this year. I have undergone operations twice in June and July. I am still too weak to participate in the discussions of the sessions of the Symposium, because of the aftereffects of the disease and operations. However, I came here since I think it my duty to say a few words of greeting to welcome our friends from abroad, on behalf of Japenese Pugwash group. The present Symposium is rather small in scale with a limited number of participants, but I believe that we may be able to make it very significant. In order to do so, we must first reflect on the spirit of the Russell-Einstein Manifesto of 20 years ago. It was novel because it was called for an international conference to be held by scientists for the survival of mankind. It was novel in denouncing all wars and aiming at the abolition of nuclear weapons, because there was always the possibility for any war to develop into nuclear war which may lead to the destruction of mankind.

In response to the Manifesto, many Pugwash conferences and symposia have been held since 1957. Nevertheless, we find ourselves not in a position to praise our success, but we have rather to grieve over our lack of achievement. This is because we have failed to stop the nuclear arms race. In particular, the two major nuclear powers have been constantly increasing

their nuclear armament both in quality and quantity during the past 20 years. This trend of vertical proliferation continues to this day.

On the other hand, we have to worry about the horizontal proliferation of nuclear weapons to more and more countries. It is true that the Non-proliferation Treaty was signed by many countries and is being ratified by an increasing number of countries. Behind the signing or ratification by many of the non-nuclear-weapon states in spite of the unfairness and disadvantage of the treaty to them, there is the hope and expectation that by so doing they can influence the nuclear weapon states to live up to their obligations regarding nuclear disarmament.

One of the most important factors hampering the way to nuclear disarmament has been the concept of nuclear deterrence. There have been diverse arguments about it, but it is clear that the policy based on the concept of nuclear deterrence suffers constantly from the positive feedback, which means the nuclear armament of the superpowers is directed toward infinity. This is just the opposite of the way to nuclear disarmament, which is in principle directed toward zero. The measures to achieve nuclear disarmament must be exclusively a process of repeated negative feedback.

Another very important problem is the security of non-nuclear-weapon states. The first thing and the very minimum that we can expect at this moment is a pledge by all nuclear weapon states that they will never use or threaten to use nuclear weapons against non-nuclear-weapon states. Such a pledge may also be useful to prevent the horizontal proliferation of nuclear

weapons. I shall not go further into all such problems, since they are going to be discussed in detail during the sessions of the Symposium.

Among the other main themes of the Symposium are the ethics and the social functions of scientists and engineers. But I leave these to the discussions of the forthcoming sessions. Instead, I would like to conclude my talk by expressing my personal vision about the future of mankind. Although it is necessary for the survival of mankind to achieve nuclear disarmament, it is also clear that nuclear disarmament is only a part of what we must achieve. It is a vital part of general and complete disarmament. Even the latter is not the whole of our aim. The final goal is to establish a world system in which the security of all countries is guaranteed without the need for their own armament. In this respect, I share with Russell and Einstein the idea of world federation.

However, irrespective of whether we have such a vision in mind or not, I think we all agree on the necessity of achieving nuclear disarmament. I believe that we all agree that nuclear weapons are our common enemy and the complete abolition of all of them from the earth is the goal at which we are aiming. I sincerely hope that the concrete proposals in the forthcoming sessions will make an effective contribution to achieve nuclear disarmament.

25th Pugwash Symposium
A New Design towards Complete Nuclear Disarmament
(the Social Function of Scientists and Engineers)
Kyoto, Japan, 28 August - 1 September 1975

Preliminary List of Participants

Austria	P. Blau
Canada	W. Epstein
Denmark	O. Maaloe
Egypt	E.E. Galal M. Mahfouz
F.R.G.	D. Senghaas
France	J. Moch
G.D.R.	H. Kröger
India	K. Subramanyam
Japan	H. Yukawa S. Tomonaga Y. Sakamoto I. Ogawa E. Yamada M. Nogami T. Toyoda H. Seki J. Nishikawa T. Watanabe S. Iijima
Netherlands	H.A. Tolhoek
Nigeria	S.E. Okoye ?
Norway	H. Olsen
Sweden	F. Janouch
U.K.	J. Rotblat
U.S.A.	W.C. Davidon R.A. Falk H. York G.W. Rathjens
U.S.S.R.	M.A. Markov V.S. Emelyanov V. Pavlichenko
SIPRI	K. Tsipis ?
W.H.O.	M.M. Kaplan

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Kyoto, Japan. 28 August - 1 September 1965

LIST OF PARTICIPANTS

BLAU, Professor Paul
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EMELYANOV, Professor Vassili Semenovich
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25th Pugwash Symposium
A New Design towards Complete Nuclear Disarmament
(the Social Function of Scientists and Engineers)
Kyoto, Japan, 28 August - 1 September 1975

Programme 1

28th August. Morning.

Opening Session. 9.30. - 10.15.

H. Yukawa: Opening Address.

J. Rotblat:

T. Toyoda:

Morning Session. 10.30. - 12.30.

Chairman: M. Kaplan.

Ref. Papers.

1.	S.Tomonaga	Science and Mankind. Remember Your Humanity and Forget the Rest.
6.	S.Iijima	Science and Scientists Today and Tomorrow.
12.	O.Maaloe	Reflections on Cleverness and Wisdom.
14.	H.Wergeland	Towards a Hippocratic Pledge.
20.	M.Kaplan	Psychological Aspects of Nuclear Weapons and Nuclear War.
28.	V.Pavlichenko	Moral Responsibility of Scientists in Connection with the Development of Weapons of Mass Destruction.

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Programme 2

28th August. Afternoon.

Afternoon Session. 14.00 - 17.00.

Chairman: J. Rotblat

Ref. Papers.

7.	H.A. Tolhoek	Optimizing the Results of the Scientists' Effort in the Struggle for Peace.
11.	N. Baptist	Some Observations on Nuclear Disarmament and a Few Suggestions on the Role of Pugwash.
18.	H. Yukawa	Thoughts on Nuclear Disarmament -- Restructuring the Pugwash Movement.
19.	J. Rotblat	Shall we put an end to the human race, or shall mankind renounce war?
24.	M.A. Markov	On the Problem of the Pugwash Movement.

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Programme 3

29th August. Morning.

Morning Session. 9.30 - 12.30

Chairman: M.A. Markov

Topic 2

Ref. Papers.

3.	T. Watanabe	Economic Aspects of Armament.
8.	I. Ogawa	A Genuine Non-Nuclear Aspect of Nuclear Proliferation Problem.
16.	J. Nishikawa	Nuclear Development and the Third World.
22.	H. Seki	The Metastasis of Nuclear Deterrence; the Crisis of the Global Policy.
25.	V.S. Emelyanov	Effects of Weapons of Mass Destruction on International Relations.

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Programme 4

29th August. Afternoon

Afternoon Session 14.00 - 17.00

Chairman: T. Toyoda

Ref. Papers:

9.	G. W. Rathjens	Partial Nuclear Disarmament
2.	E. Yamada	A Proposal for an Agreement on Non-Use of Nuclear Weapons against Non-Nuclear States
13.	H. Kroger	Some Remarks on Steps towards Nuclear Disarmament
27.	V. S. Emelyanov	First Steps along the Road of Nuclear Disarmament
15.	B. T. Feld	Arms Control or What?

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Programme 5

30th August, Morning.

Morning Session. 9.30. - 12.30.

Chairman: T. Toyoda

Topics 3

Ref. Papers:

10. W. Epstein — A Programme for Nuclear and General Disarmament.

General Discussions.

Afternoon Session. 14.00. - 17.00.

Chairman: H. York

(1) General Criticism of the Theory of Deterrence.

H. York: An outline of the matter.

others:

(2) Discussion of the Relationship of Disarmament Problem to other more Basic and General Problems.

Ref. Papers:

29. R. Falk — An Approach to Total Nuclear Disarmament: A Three Stranded Rope.

General Discussions.

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Programme 6

31st August, Morning.

Morning Session. 9.30. - 12.30.

Chairman: O. Maaløe

Ref. Papers.

4.	H. York	Earlier Attempts at Nuclear Disarmament.
21.	Y. Sakamoto	A Political Design for World Disarmament.
17.	T. Toyoda	Dynamical Aspects of Nuclear Disarmament.
26.	V.S.Emelyanov	Measures Leading to Complete Nuclear Disarmament.
5.	P. Blau	Towards Nuclear Disarmament. Possible Contribution of Small Neutral Nations.
23.	F. Janouch	About Necessary Conditions for Disarmament.
32.	M. Mahfouz	The Role of the UN and its Organizations in Future Models of Disarmament.

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Papers

1. S. Tomonaga (Japan) -- Science and Mankind. Remember your humanity and forget the rest
2. E. Yamada (Japan) -- A Proposal for an Agreement on Non-Use of Nuclear Weapons against Non-Nuclear States.
3. T. Watanabe (Japan) -- Economic Aspects of Armament.
4. H. York (USA) -- Earlier Attempts at Nuclear Disarmament.
5. P. Blau (Austria) -- Towards Nuclear Disarmament. Possible Contribution of Small Neutral Nations
6. S. Iijima (Japan) -- Science and Scientists Today and Tomorrow.
7. H.A. Tolhoek (Netherlands) -- Optimizing the Results of the Scientists' Effort in the Struggle for Peace.
8. I. Ogawa (Japan) -- A Genuine Non-Nuclear Aspect of Nuclear Proliferation Problem.
9. G.W. Rathjens (USA) -- Partial Nuclear Disarmament.
10. W. Epstein (Canada) -- A Programme for Nuclear and General Disarmament.
11. N. Baptist (Sri Lanka) -- Some Observations on Nuclear Disarmament and a Few Suggestions on the Role of Pugwash.
12. O. Maaløe (Denmark) -- Reflections on Cleverness and Wisdom.
13. H. Kroger (GDR) -- Some Remarks on Steps towards Nuclear Disarmament.
14. H.Wergeland (Norway) -- Towards a Hippocratic Pledge.
15. B.T. Feld (USA) -- Arms Control or What?
16. J. Nishikawa (Japan) -- Nuclear Development and the Third World.
17. T. Toyoda (Japan) -- Dynamic Aspects of Nuclear Disarmament.
18 H. Yukawa (Japan) -- Thoughts on Nuclear Disarmament -- Restructuring the Pugwash Movement.
19. J. Rotblat (UK) -- Shall we put an end to the human race, or shall mankind renounce war?
20. M. Kaplan (WHO) -- Psychological Aspects of Nuclear Weapons and Nuclear Warfare.
21. Y. Sakamoto (Japan) -- A Political Design for World Disarmament.
22. H. Seki (Japan) -- The Metastasis of Nuclear Deterrence; the Crisis of the Global Polity.
23. F. Janouch (Sweden) -- About Necessary Conditions for Disarmament.
24. M.A. Markov (USSR) -- On the Problem of the Pugwash Movement.
25. V.S. Emelyanov (USSR) -- Effects of Weapons of Mass Destruction on International Relations.
26. V.S. Emelyanov (USSR) -- Measures Leading to Complete Nuclear Disarmament.
27. V.S. Emelyanov (USSR) -- First Steps along the Road of Nuclear Disarmament.
28. V. Pavlichenko (USSR) -- Moral Responsibility of Scientists in Connection with the Development of Weapons of Mass Destruction.

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Supplementary List of Papers I

29. R. Falk (USA) -- An Approach to Total Nuclear Disarmament: A Three-Stranded Rope.

30. W.C.Davidon (USA) -- We Can Help Stop the Proliferation of Nuclear Weapons.

31. E.E.Galal (Egypt) -- Prerequisites of Disarmament.

32. M. Mahfouz (Egypt) -- The Role of the UN and its Organizations in Future Models of Disarmament.

33. D. Senghaas (FRG) -- Armament Dynamics and Disarmament.

9a. G.W.Rathjens (USA) -- The Conditions Necessary for Complete Nuclear Disarmament and the Implications of their Identification.

SPECIAL PROGRAMME

Owing to a special arrangement by Professor S. Tomonaga, President of the Nishina Memorial Foundation, we are permitted to show the scientific film entitled "Effect of Atomic Bombs on Hiroshima and Nagasaki" to the participants in the Kyoto Symposium. The film was made by Japanese scientists under the supervision of the late Dr. Y. Nishina immediately after the atomic explosions in order to record the reality of atomic bombs. However, it was confiscated by the Occupation Army and classified for many years.

A few years ago the film was returned to the Japanese Government under some restrictions. The film was edited with the English narration by the US Strategic Bombing Survey Group. It consists of two parts. We are obliged to show the whole film, which is about 2 and a half hours long, so we shall show it in the following way:

]st part (Hiroshima) : 5.30 - 6.45 p.m. Friday, August 29th

2nd part (Nagasaki) : 5.20 - 6.35 p.m. Saturday, August 30th.

in Room D, Kyoto International Conference Hall.

A few fragments of the film have been publicized in several forms, for example, "Hiroshima 8.6" by the Mass Communication Center of Columbia University, "Hiroshima" by the Hiroshima Citizens Group. However, the whole film has not yet been shown to the public. Even now only qualified scholars are allowed to see it.

T. Toyoda

Bus Service Time Table

1) From Kyoto Hotel to International Conference Hall:

Lv. Kyoto Hotel at 8:50 a.m. (from August 28th to September 1st every morning)

2) From International Conference Hall to Kyoto Hotel:

August 28th

Lv. Conf. Hall at 5:20 p.m.

August 29th

Lv. Int. Conf. Hall at 5:30 p.m.

and at 7:00 p.m.

August 30th

Lv. Int. Conf. Hall at 5:30 p.m.

and at 6:50 p.m.

Schedules for August 31st and September 1st are still pending.

3) Bus service for participating "Reception" on August 28th.

Lv. Kyoto Hotel at 7:00 p.m. for Miyako Hotel.

American Academy of Arts and Sciences
165 Allandale Street
Jamaica Plain Station, Boston, Massachusetts 02130
Telephone 617 522-2400

August 21, 1975

Professor Toshiyuki Toyoda
c/o Professor Hideki Yukawa
Yukawa Hall
University of Kyoto
Kyoto, Japan

My Dear Toyoda:

I am now back home from the hospital and feeling very much better. However, it is clear that it will be some time before I am able to travel again - - certainly notuntil long after the conclusion of the Kyoto Symposium.

I wish to take this opportunity to send you and your colleagues all my best wishes for the success of the Symposium. The Pugwash Council and Executive Committee look upon the Kyoto Symposium as more than just the major Pugwash effort in the disarmament field during the year 1975. To most of us, it represents the most important Pugwash effort of this past decade to find a way back to the basic issue on which we were founded: the elimination of nuclear armaments, once and for all, from the arsenals of all nations, large and small, industrialized and developing.

That this is an ambitious programme goes without saying. Whether or not it is a utopian programme depends on one's views of the alternatives. For a world teetering on the brink of disaster, utopia may well be the necessary condition for survival.

What is important is that we shall openly and honestly confront the alternatives, and try to find some way, even if only the beginning, out of one dilemma in which we now find ourselves - - a situation in which all paths seem, by one way or another, to be leading toward the same disaster. There must be another route that will avoid it. If the Kyoto Symposium can only point the way to such a new direction, it will already have accomplished a great deal. If, in addition, it can help start the world down the path toward salvation from the nuclear menace, it will have performed a task of historic significance.

All my hopes and best wishes are with you in this vital task.

Sincerely,

B T Feld

Bernard T. Feld
Secretary-General, Pugwash

BTF/db

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G.W. Rathjens (USA)

XXV-9a

THE CONDITIONS NECESSARY FOR COMPLETE NUCLEAR DISARMAMENT AND THE IMPLICATIONS OF THEIR IDENTIFICATION

It is suggested that the following are minimum conditions:

1. Surrender of national sovereignty to a supranational authority with
   - (a) authority for compulsory adjudication of disputes
   - (b) control over a police force having
     - (1) military capabilities substantially stronger than those of any state
     - (2) extensive rights of search.
2. Abolition of secrecy (with very limited exceptions).
3. Totally free movement of people including specifically the unrestricted right of asylum anywhere to those disclosing violations of measures relating to the development, construction, or stockpiling of nuclear weapons.
4. Control (not just inspection) by an international authority of all facilities for
   - (a) separation of uranium isotopes
   - (b) production of fissionable materials (all reactors)
   - (c) separation of fissionable materials from other reactor products.

If we can agree on this or a modified list of conditions, we are led to two questions:

1. Can we describe a programme for bringing them about?
2. If we can not, what can we do to move as far as possible in achieving nuclear disarmament?

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V.S.Emelyanov (USSR)

XXV-25

THE EFFECT OF WEAPONS OF MASS DESTRUCTION ON INTERNATIONAL RELATIONS

The creation of nuclear weapons in the USA in 1945 brought into the arena a new pretender to world supremacy. President Truman announced that in 1945, whether we like it or not, we are obliged to acknowledge the fact that the victory we have gained has placed upon the American people the burden of responsibility for the future leadership of the world. This announcement was made after Hiroshima and Nagasaki had been destroyed by atomic bombs.

The well-known English scientist , M. P. Blackett, defined the significance of using nuclear weapons at that time: "Using the atomic bomb was not so much the final act of the Second World War, as it was the first big operation in the cold diplomatic war against the USSR, which is being waged to this day."[1] In actual fact, the "cold war" did essentially begin after the atomic bombs were dropped on Hiroshima and Nagasaki. Before the Second World War, the Soviet Union did not think about atomic weapons. Work on creating such a weapon began in the wake of Germany and England: this work became particularly intensive after the general, political, aggressive, anti-Soviet, imperialist purpose of creating an atomic weapon became clear. The only way to restrain the new pretenders to world supremacy and cool their ardour was to create an atomic bomb as soon as possible. And this was done.

It should be recalled that the first atomic power station and the first ship driven by atomic power, which was used for peaceful purposes, the ice-breaker "Lenin", were constructed in the Soviet Union. They were built at an extremely difficult time for the country, soon after the bloody and devastating war against Hitler's Germany. The building of atomic power stations in other countries did not begin until a considerable time later.

It should also be borne in mind that the "cold war" began after the atomic bombing of Hiroshima and Nagasaki and pressure was brought to bear on the Soviet Union in various ways. In commerce, a list of goods was drawn up whose sale was prohibited, and in US military and political circles, political and military strategic concepts of the policy of "restraint", followed by the

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[1] Quotation from L. F. Ilichev. The Progress of Science and Technology in International Relations. "Znanie" Publishers, 1958, Series VII, p. 20.

policy of "liberation" and a number of other military and political concepts springing from the possibility of using force in the form of atomic weapons, were being worked out one after the other. The creation of nuclear weapons in the Soviet Union forced people to revise these concepts: and when the power of these weapons grew to such an extent that it became dangerous to make the first atomic strike, because one might receive a shattering blow in reply, it became obvious to all reasonable, thinking people that, when it came to the socialist countries, the policy of operating from a position of force would bring no consolation. Throughout the "cold war", more than two decades, the Soviet Union persistently advocated the need for disarmament and cooperation, proposing that relations with other countries should be based on the possibility of the peaceful coexistence of countries with different social systems.

"Over the last few years the belief in the different, and moreover, in the necessity for peaceful coexistence has become firmly established in the consciousness of both the wide masses of the people and also of the ruling circles in most countries".[1] Over the last few years, considerable success has been achieved in lessening the tension in international relations which was engendered by the "cold war".

Ties between countries have developed considerably and contacts have improved. These include contacts between scientists, although the reflections of the storm that raged still remind us of the years of stormy weather.

The present atmosphere in relations also favours ties and contacts in the field of scientific and technological cooperation. This is a great achievement on the part of progressive society throughout the world.

Our time places before science and scientists many new and complicated tasks. The traditional sources of industrial raw materials are beginning to be exhausted, and more and more frequently one hears of shortages of tin, copper, lead, zinc and a number of other metals. Anxious voices speak of an energy crisis.

Of late, in the press in a number of countries, many articles, brochures and books have appeared in which the possible misfortunes which might befall mankind in connection with the construction of a large number of atomic power stations are drawn up in extraordinarily gloomy tones. The

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[1] L. I. Brezhnev's speech to the electorate. "Pravda", June 14, 1975.

pessimists consider that the reasons for this danger are the following:

Atomic reactors cause pollution of the environment, both radioactive and thermal.

An accident at an atomic power station may lead to fatal pollution of the environs, and the plutonium accumulated in the power station's reactor represents an extra danger. On the one hand, it might be a target for theft, and criminal elements might use it to make nuclear explosives for the purpose of organizing sabotage and extortion. On the other hand, the accumulation of plutonium in countries with atomic power stations will create a nuclear weapon potential in them, which undermines the agreement on the non-proliferation of weapons and will give rise to yet other countries with nuclear weapons.

But can these problems be solved? Of course they can. The experience already gained and the results of scientific research and investigations now being carried out, will allow us to guarantee the safe exploitation of atomic power stations to a sufficient extent.

It should incidentally be recalled that the number of accidents at atomic power stations is considerably lower than in all other ordinary, long established industrial enterprises.

Nevertheless, new technology and modern scientific establishments and industrial enterprises need peace and cooperation, for only in these circumstances can they be expected to produce the best possible results. The fear of everything connected with nuclear processes has become pathological.

"Fear is perhaps one of man's most primitive feelings, which he experiences most frequently right from the very beginning of consciousness..." says Professor J. M. Legay. Wars justified themselves with this fear. It is possible that overcoming the fear of a real or imaginary opponent formed the psychological basis for man's perception of the classical saying: "If you want peace, prepare for war".

The establishment of new relations between people, based not on a feeling of fear or on the military superiority of this or that state but on mutual respect and trust, is without doubt a natural condition for peace and disarmament. One cannot but agree with this. It is not excluded that this fear is being maintained artificially by those circles which are not interested in the use of atomic energy for peaceful purposes, but in designating atomic energy for military purposes. It is said that countries on the territory of which atomic power stations have been built can produce nuclear weapons using plutonium from the reactors. But there is a system of control of nuclear materials worked out by the International Atomic Energy Agency. If this system is

not a sufficient guarantee of the prevention of the diversion of nuclear materials, then the system can be reviewed, although there are no grounds for doubt that the control system of the International Atomic Energy Agency is effective. The April issue of the Bulletin of the Atomic Scientists published a letter signed by ten well-known biologists, physicists, chemists and other scientists to the President of the USA, Mr. Ford. In their letter, they attract the attention of the President to the fact that the full implementation of a programme of building atomic power stations in the USA is bound to produce huge amounts of radioactive materials which will create "special and substantive danger".

As a result of the long-lasting effects of radioactive materials, many generations "of our children and our children's children will be faced with the dangers created by the radioactive waste of our nuclear power stations" [1] This is what the scientists say.

"Because of the massive speeding up in the construction of nuclear plants, there is a tendency to overlook necessary safety reccommendations." [2] There is ".. much accumulated evidence that profit-oriented enterprises place public safety below other priorities." [3]

What can one say about the considerations mentioned? It is possible to create technologically safe conditions at atomic power stations, both for those working there and those living in the surrounding area. To create such conditions in a country so that those to whom the stations belong take people into consideration before all else, and do not just try to make maximum profits is another question and relates to the social conditions existing in that country.

At the beginning of this year yet another question connected with nuclear energy was raised at the meeting of representatives of two associations which assist the UNO: the UN Association of the Soviet Union and the UN Association of the USA. This question was posed by the well-known American journalist R. Kleeman, a member of the editorial board of the newspaper "The New York Times". Explaining what he had in mind and why he advanced the question, R. Kleeman siad that it is common knowlege that the creation of plutonium factories in countries with atomic power stations will contribute to the production of nuclear weapons. It is considerably easier to obtain plutonium from the fuel elements of a station's atomic reactor than to master

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1 The Bulletin of the Atomic Scientists, April 1975. Nuclear Hazards. p.3.
2 Ibid.
3 Ibid.

the technology of separating isotopes from uranium, and the construction of plants to carry out this separation requires tremendous outlays. Therefore, the construction of plutonium plants should not be permitted. In reply to the question that atomic power stations will not be economical unless they use plutonium, and will not be able to withstand the competition from power stations running on organic fuel, and what is more, this will immediately considerably lower the available resources of uranium fuel, Kleeman says that it is a well known fact that as yet no-one anywhere in the world has ever used plutonium in atomic power stations, and calculations made in the USA show that it is not economically justified. He stressed that the construction of plants to recover plutonium is an expensive matter and not economically justified. He reports that there is only one plutonium plant in the USA and it is not proposed that any more should be built. According to Kleeman, all the waste fuel elements from the corresponding atomic power stations are not reprocessed, but are put into store in special storages.

Thus, in the USA there are a number of contradictory points of view with regard to the usage of atomic power in the country's power economy. The second important field in which it was considered possible to use atomic energy until quite recently is the use of nuclear explosions for peaceful purposes.

In September 1958, almost 17 years ago, at the Second International Conference on the peaceful use of atomic energy, convered by the United Nations Organization in Geneva, the international public heard the first ever report on the possibility, importance and expediency of using nuclear explosions for many peaceful purposes where the energy of the explosion might be used successfully. At that time, it was pointed out in particular that this energy can be used in large-scale excavation work where large amounts of soil or rock need to be moved, for instance in the construction of large canals, in laying out ports or in opening up coal and ore deposits near the surface where the removal of the soil or rock covering makes it possible to work the deposit by the opencast method. It was also noted that the output of oil and natural gas could be increased by using nuclear explosions and that it would be advantageous to build large reservoirs in areas where there is a water shortage, and also underground reservoirs for gas.

At the same time, in the speeches on this report, a warning was sounded with regard to the danger of contaminating the environment with the radioactivity which is inevitably formed in the process of nuclear fission. Even the reader of the report, G. W. Johnson, announced that this work requires "clean" nuclear explosives. The day before the report by Johnson, Edward Teller read a paper on the possibility of creating "clean" nuclear explosives.

But it is a well known fact that over the last 17 years the problem of creating "clean" nuclear charges has not been solved. Moreover, at the Pugwash Symposium in Racine (Wisconsin, USA) in 1970, it was suggested that it is hardly likely that a solution guaranteeing that atomic explosions could be carried out without fission fragments would be solved in the next few decades.

Over the last few years, individual studies have been made of the possibilities of using nuclear explosions for the above-mentioned purposes. But all these works on the peaceful uses of nuclear explosions did not acquire the scale which was proclaimed when this question first came to the fore. Work has been done in just three countries: the USA, the USSR and France, and last year one explosion of this type was produced in India. These countries have limited themselves to calculations, investigations and explosions which are in essence experimental and only in certain cases of an experimental and practical nature.

Large projects such as the construction of a second Panama canal and the building of large ports in Alaska and Australia drawn up in the USA have not been carried out. Quite naturally, one wonders what the reason for this situation is.

The reason can be sought in the quite reasonable misgivings about the possible contamination of the environment with radioactivity, which hangs over all these projects like the sword of Damocles. Although the question of the use of nuclear explosions for peaceful purposes has been raised from time to time at a number of international fora, nevertheless work has still not proceeded beyond industrial experiments, although in a number of cases these have been large-scale.

At the Pugwash Conference in Ronneby (Sweden) in September 1967, in the report of the first working group, who examined questions of disarmament and control of armaments, it was noted that: "While there may be a long-term economic advantage in employing nuclear explosives for recovery of oil, construction of tunnels etc., there does not seem to be any significant advantage in using nuclear explosives as compared with other means of realizing the same objectives. Indeed, we believe that the potential advantages of nuclear explosives for peaceful purposes to be sufficiently small so that such programmes should be suspended if they appear to conflict with progress in arms control and disarmament." [1]

At the international conference of the non-nuclear coun tries held

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[1] Proceedings of the 17th Pugwash Conference on Science and World Affairs. Ronneby, Sweden, September 3 - 8, 1967. p. 40.

in Geneva in]968, the question of the use of nuclear explosions was broached in both the reports and the speeches of the participants.

At the Pugwash Symposium in London in]969, which was devoted to "Preventing the Spread of Nuclear Weapons", Professor D. R. Inglis presented the paper "Civil Uses of Nuclear Explosives". In this paper, Inglis stressed that "three general types of non-military uses of nuclear explosives are foreseen: (a) recovery of natural resources; (b) digging; (c) scientific neutron experiments. The first two are in the development stage and have not as yet produced any useful products". [1] (underlined by me - V.E.)

Inglis further writes: "The nuclear cratering experiments have shown that a surprisingly high fraction of the radioactivity is contained beneath the bottom of the crater, being buried by the rock that is ejected almost vertically high into the air and falls back in to the crater. Still, some radioactivity does escape, its amount depending on the design of the nuclear explosive. It appears that much of the nuclear-explosive research carried out with testing in the United States in recent years has been aimed at reduced radioactivity (developing a so-called "clean" explosive) with this application in mind". [2]

At the same Symposium, during the discussion of the report by I. Th. Rosenqvist, "The Comparative Economy of Nuclear and Ordinary Fuel", considerable emphasis was also placed on questions of using nuclear explosions to increase the output of natural gas, oil and the underground production of gas from carbonous shale.

Since the time of the first report on the peaceful uses of nuclear explosions by G. Johnson in]958, a great deal of research and experimental work has been done, although experiments have only been carried out in two out of the five nuclear countries, the USA and the Soviet Union.

In the USA, four national Symposia devoted to this question have been held (in]955,]959,]964 and]970), and a considerable amount of scientific and technological material has been published. Examination of these publications allows one to come to the conclusion that the research work carried out in both countries has produced identical

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1 Pugwash Monograph. Preventing the Spread of Nuclear Weapons. London. Souvenir Press,]969 p. 79.

2 Ibid, p.8].

results and roughly the same idea has been formed of the problem.

Here one cannot help remembering the former director of the Argonne Laboratory, Professor N. Hillberry, who told Soviet scientists visiting the Laboratory in 1959 that "if a question is put correctly, the answer will ne unambiguous irrespective of who it was put by -- American or Russian".

The research and a number of experiments carried out in the USSR and the USA followed the same pattern: they were aimed at testing the possibilities of using nuclear explosions for the extraction of gas and oil, for opening up ore deposits, for the removal of earth in the construction of canals and for similar purposes. In the USA, an extensive general programme of work has been composed, called the Plowshare Programme, which consists of a number of projects.

A programme has also been drawn up in the Soviet Union. Besides calculations and experiments, this programme includes a number of large scale experiments and the realization of experimental industrial projects. The name of this programme is longer than that of the American one, namely "Programme for the Use of Industrial Underground Nuclear Explosions".

When the draft of the agreement on the non-proliferation of nuclear weapons was considered, interest in the peaceful use of nuclear explosions grew considerably. In the agreement, this was reflected in a special clause (clause 5), according to which countries possessing nuclear weapons are obliged to put at the disposal of countries which do not have nuclear weapons the benefits of using nuclear explosions for peaceful purposes.

During excavation work when the earth is ejected the radioactive fall-out is deposited a considerable distance from the site of the explosion and contamination of the soil with radioactivity occurs.

Thus, for example, Y. A. Israel and V. N. Petrov, who have conducted research into the spread of radioactive fall-out during underground nuclear explosions where the soil is ejected, have established that as a result of the eruption of the cavity, a certain amount of radioactive products is given off into the atmosphere. "Part of the radioactive products formed during the explosion rise with the soil and fall back into the crater. The remaining radioactive products spread out in the base surge and the cloud which are formed after the explosion. The radioactive products combined with comparatively small parti cles of earth

are carried by the wind for a considerable distance from the site of the explosion, as a result of which radioactive contamination of the surrounding area occurs."]

Despite the successful experiments carried out in the USA and the USSR on using nuclear explosives to increase the output of gas and to create underground gas reservoirs, and experiments on excavation work, the main problem preventing the wide-scale use of this method has not as yet been solved, since the danger of contaminating the environment with radioactive fall-out has not been completely eliminated.

Therefore, I believe that peaceful atomic explosions should only be used at present in exceptional circumstances when the problem cannot be solved by any other means, and the problem just has to be solved. They should be used primarily in experiments and experimental industrial work and must be under strict scientific and technological control.

Nuclear explosions can only be used on a wide scale for peaceful purposes when really "clean" nuclear charges have been created, without using as the initiator of the processes of nuclear synthesis the fissionable materials that form fission fragments.

] Atomic Exploaions for Peaceful Purposes. "Atomizdat" Publishers, Moscow,]970, p. 87. (In Russian.)

25th Pugwash Symposium
A New Design towards Complete Nuclear Disarmament
(the Social Function of Scientists and Engineers)
Kyoto, Japan, 28 August - 1 September 1975

V.S. Emelyanov XXV-26

MEASURES LEADING TO COMPLETE NUCLEAR DISARMAMENT

It is considerably easier to find a solution to the problem of complete nuclear disarmament within the framework of a solution to the problem of universal and complete disarmament. Armed forces and military equipment form a highly intricate complex and some types of arms correspond to others, and it is expedient to consider them in their entirity . The security of countries hinges on this complex, and the latter determines the military doctrines for ensuring security. This intricate complex of armaments was created having regard to the geographical conditions of countries, their economies and industrial development and their military and political concepts.

The disarmament problem is too complicated for a mutually acceptable solution to be found by limiting consideration to the question of complete disarmament of one kind of military equipment, though it be an extremely powerful one.

The Soviet Union raised the question of complete nuclear disarmament, i.e. destruction of nuclear weapons, immediately after the explosion of the first atomic bombs, at a time when it would have been easy to reach a practical solution, independent of the general question of disarmament.

On January 24, 1946, the United Nations General Assembly decided to set up a Commission "for consideration of the problems arising in connection with the discovery of atomic energy and other questions connected with it". On June 19, 1946, the draft of an international agreement "on the prohibition of the production and application of weapons based on the use of atomic energy, for the purposes of mass destruction" was put forward by the Soviet delegation.

The first article of this draft agreement contained the following statement:

"The High Contracting Parties solemnly declare their unanimous decision to prohibit the production and application of weapons based

on the use of atomic energy, and with this aim in mind, take upon themselves the following obligations:

(a) not to use atomic weapons in any circumstances whatever;

(b) to prohibit the production and storing of weapons based on the use of atomic energy;

(c) to destroy within a period of three months from the day the present agreement comes into force, the entire stock of ready weapons and those in production (underlined by me - V.E.)

But those Soviet proposals were not accepted as US statesmen had quite different intentions. Instead of destruction of nuclear weapons, the USA then proposed a plan to control fissionable materials. All the 14 points of the plan which subsequently became known as the Baruch plan, were devoted primarily to questions of control, but not a single point mentioned how and when the nuclear weapons which only the USA possessed at that time, would be destroyed. The first point in the plan, "General Provisions" says that "an international agency should work out a careful plan of control over the use of atomic energy, through establishment of various forms of ownership, possession, licensing, operation, observation, research and supervision with the aid of competent personnel". Control was also mentioned at the end of the plan; the last point was entitled "International Control". According to this plan, the USA would retain atomic weapons while forbidding all other countries to produce them.

The French publicist M. Ruse, noted that the objective of the Baruch plan was neither a ban on and destruction of atomic weapons, nor restoration of a free flow of scientific information, but establishment of the hegemony of the USA in controlling fission materials and their use in industry, as well as for military purposes".[1] The prominent English scientist P. Blackett stressed that the Baruch plan threatened the security of the USSR, for it "would put the Soviet Union in the position of subordination to the group of nations headed by America. Blackett pointed out that even before a ban on and destruction of atomic weapons the Baruch plan provided for carrying out an "unlimited inspection in the USSR by inspectors of the United Nations Organization, and hence the general staff would

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1. M. Ruse. Robert Oppenheim and the Atom Bomb, Moscow, 1963, p.71.

have the opportunity to draw up quite a complete plan of installations in the USSR, and even develop an extensive network of military and industrial espionage. In the international situation obtaining when America has stocks of atomic bombs and when she advocates the use of them as a normal means of warfare, the Soviet military authorities would be quite right in considering that keeping secret the precise location of military and industrial enterprises in an area and even of new industrial areas is of great importance from the military point of view."[1] The well-known English scientist Bernal, wrote that adoption of the Baruch plan, meant allowing the real control of the United States government not only over atomic energy, but also over offensive and defensive armed forces throughout the world.[2]

When analysing this plan, P. Blackett noted that it was rather "an integral part of the Anglo-American diplomatic offensive known as the cold war than an attempt to reach agreement".[3]

The "cold war" lasted for almost a quarter of a century, and in that period it was, of course, impossible to expect achievements in the field of disarmament, especially in that of essential nuclear disarmament, although throughout its entire existence the Soviet Union has never eased its efforts in the field of disarmament. With the support of progressive public and reasonable politicians and statesmen, as early as 1932 an attempt was made to call a disarmament conference, and it was eventually held. At this conference on February 18, 1932, the Soviet delegation put forward a draft resolution on universal and complete disarmament. Recalling the history of the struggle for disarmament, the General Secretary of the World Federation of Scientific Workers, Professor P. Biquard, says: "It is useful to remember that the failure of the disarmament conference in 1932 was the direct result of the activities of the industrial group interested in warships, military aeroplanes and so forth. An official inquiry revealed the methods of direct and indirect corruption that the group used to sabotage the conference."[4]

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1. P.M.S. Blackett. Military and Political Consequence of Atomic Energy. London, 1948, p. 144.
2. J. Bernal. Science and Society, 1958.
3. P.M.S. Blackett. Military and Political Consequence of Atomic Energy. London, 1948, p.191.
4. P. Biquard. Political and Technical Obstacles to Disarmament. France. Scientific World. 1973. p.4.

In May 1955, the Soviet government put forward a proposal on arms cuts, ban on atomic weapons and elimination of the threat of a new war. The proposal was submitted to the Sub-Committee of the UN Commission on Disarmament.

In the proposals submitted it was suggested that an international agreement should be concluded as regards arms cuts and a ban on atomic weapons. The agreement was to provide for a complete prohibition of the use and production of nuclear weapons as well as all other types of weapons of mass destruction, and for converting the existing stocks of nuclear weapons to use for peaceful purposes.

A cut in the conventional armaments of states, the prohibition of atomic, hydrogen and other types of weapons of mass destruction, and also the conversion of fission materials from nuclear weapons to exclusively peaceful purposes, was to be carried out in two years (in 1956 and 1957). While giving the Soviet Union's proposals their due in their public statements, the western powers at the same time sought ways of avoiding specific discussion of them and then even repudiated their own proposals. A number of significant pieces of evidence testify to the situation which came about in the Sub-Committee of the UN Commission on Disarmament. Thus, for example, the secretary of the British delegation in the Sub-Committee, Hugh Thomas, wrote that when the USSR took an important part in the western programme for disarmament in 1955, "panic" began in the USA.[1] The American militarists did everything in their power to prevent a relaxation of international tension. General A. Grunther announced at the conference of American Mayors in New York, on May 19, 1955, that "it would be unthinkable to ban the atom bomb". He expressed fear that public opinion might force political leaders to prohibit atomic weapons.[2] Grunther, Commander-in-Chief of the NATO forces in Europe, feared the discontinuation of atomic blackmail more than anything else.

The former Aviation Minister T.K. Finletter not only objected to the Soviet proposals, but to the western proposals as well. He announced that the proposals of the western states were "impracticable";

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1. The Political Quarterly, 1960. Jan-March, p.22.
2. "Pravda", 29.5.1955.

"if Russia", he said,"accepts all of the West's proposals, then the United States might find itself compelled to refuse to carry out what they themselves proposed."[1] After seven years of activities in search of ways to achieve disarmament, in March 1962, the Soviet Union presented a draft agreement on general and complete disarmament under strict international control, to the "Eighteen Nation Disarmament Committee".

In the first article of the draft agreement the following commitments are listed for the states taking part in the agreement:

The states participating in the present Agreement solemnly commit themselves:

1. To carry out general and complete disarmament over a period of five years, including:

- the disbandment of all armed forces and the prohibition of their restoration in any form whatsoever;

- ban on, and destruction of, all stocks and termination of production of all types of mass destruction weapons, including atomic, thermonuclear, chemical, biological and radiological weapons;

- destruction and abolition of the production of all means of delivering weapons of mass destruction to their target;

- dismantling of all kinds of foreign military bases, withdrawal and disbandment of all foreign troops stationed in any state;

- abolition of all forms of military service;

- discontinuation of all military instruction and the closing down of all military educational establishments;

- abolition of all military ministries, general staffs and local organs, as well as all other military and para-military establishments and organizations;

- liquidation of all forms of conventional weapons and military equipment, the discontinuation of their production, with the exception of the production of a strictly limited number of agreed types of firearms for police (militia) use after general and complete disarmament has been achieved by states;

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1. Quot. from V.M. Heizman. The USSR and the Problems of Disarmament 1945-1959. Moscow. "Nauka" Publishers, 1970, p.247.

- discontinuation of appropriation of funds for military purposes, both from the state budget and also from contributions by organizations and individuals. It was proposed that general and complete disarmament should be carried out in three consecutive stages so that no state or group of states should gain military supremacy and so that the security of all the states participating in the Agreement should be equally guaranteed.

The Soviet plan envisaged that general and complete disarmament should be completed in four and a half years. The first stage - in 18 months, the second - in 24 months and the third - in 12 months.

On April 18, 1962, the USA submitted for consideration to the "Eighteen Nation Disarmament Committee", its outline of a plan for an agreement on general and complete disarmament in a peaceful world. The plan provided for disarmament being carried out in three stages. At the first stage which was to last three years, armaments were to be cut by 30 per cent, including 30 per cent of the means of delivery of nuclear weapons.

At the second stage, of the same duration, cuts in armaments were to amount to 35 per cent and at the third stage - the remaining 35 per cent. In the American proposals the duration of the third stage was not indicated.

According to the project proposed by the USA, disarmament would not only be drawn out over a long period, but the term in which complete disarmament was to be ultimately achieved was not specified. The term of six years was set only for the first two stages of disarmament. This means that nuclear weapons could be preserved for an unlimited time.

Thus, the Soviet project for general and complete disarmament eliminated without delay the danger of a world holocaust occurring, should a world war break out in which nuclear weapons were used, whereas the American plan for disarmament did not eliminate that danger and consequently condemned all the peoples of the globe to live with the constant fear of a possible nuclear war with all its catastrophic consequences. It became more and more obvious that people's collective wisdom was needed to resolve the problem of general and complete disarmament swiftly.

That is why we scientists not only hold symposia, but also inter-

national conferences to discuss the complicated problems of modern science. For the discussion of questions connected with the peaceful uses of atomic energy, for example, since 1955 four international conferences have been held according to a UN resolution. Surely general and complete disarmament is a no less important and no less complicated issue than the problems posed by modern science. Meanwhile, the scientific conferences mentioned in Geneva have been of considerable benefit to modern science, and have set a landmark in the further development of scientific research.

... Thirteen years have passed since then. Over this period the Soviet Union has not eased its efforts in the struggle to establish peace on Earth and in its quests for ways of achieving general and complete disarmament. During that period the Peace Programme was worked out and approved by the XXIV Congress of the CPSU. This programme has found extensive support among the progressive public throughout the world, for it reflects the aspirations of everyone on our planet. Over the last few years a great deal has been done to clear the path for general and complete disarmament. Nuclear weapon tests in three media have been discontinued and a treaty on the non-proliferation of nuclear weapons has been concluded and signed by more than a hundred states. This progress has also been served by such extremely important agreements as the Soviet-US agreement on the Prevention of a Nuclear War, the treaties and agreements on the limitation of strategic weapon tests, and the limitations on underground nuclear weapons tests. The use and production of bacteriological (biological) weapons have been prohibited. The placing of nuclear weapons on the seabed and ocean floor and the use of space, the moon and other heavenly bodies for military purposes, has been forbidden. The UN General Assembly approved a proposal to conclude an international agreement to prohibit the modification of natural environment and climate for military purposes. The policy of co-existence of countries with different social systems is winning ever greater recognition. The final act unanimously approved and signed at the Conference on Security and Cooperation in Europe is the apotheosis of the new relations in Europe.

All this confirms the need to call a World Conference on General and Complete Disarmament. The conditions which have come about, are favourable for this.

At a world conference on general and complete disarmament

all countries can put forward their considerations with regard to all types of weapons, on an equal footing; they can hear what other countries propose and clear away the obstacles in the way to the further progress of the movement more easily and rapidly. Multi-lateral discussions on the problem of disarmament, the possibility of explaining in detail nebulous questions or those which give rise to doubt or misunderstanding will assist in the achievement of a consensus on the key problems of disarmament and also in noting real ways of establishing the order of priority of the various stages of disarmament.

The United Nations Organization recognizes the importance of convening a world conference on disarmament. Since 1971 all the sessions of the UN General Assembly have advocated that a World Conference on Disarmament should be held. A UN Special Committee created for the organization of the Conference, has been at work for two years now. The time has come to pass from words to deeds, to carry out disarmament in practice. The convening of a World Conference will mean that definite decisions will be taken sooner.

25th Pugwash Symposium
A New Design towards Complete Nuclear Disarmament
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Kyoto, Japan. 28 August - 1 September 1975

V.S. Emelyanov (USSR)

XXV-27

FIRST STEPS ALONG THE ROAD OF NUCLEAR DISARMAMENT

The Soviet people launched its struggle for peace, international security and disarmament when the Soviet state first came into being. One of the first decrees of the new state was the Decree on Peace drafted by V.I. Lenin personally and submitted by him on October 26 (November 8 on the new calendar) 1971 for consideration by the 2nd Congress of Workers', Soldiers' and Peasants' Deputies and unanimously approved by the Congress. Back in 1922 at the first session of the international conference on economic and financial questions in Genoa, the Soviet delegation proposed universal disarmament and disbandment of regular armies.

For several decades the Soviet Union has energetically sought to solve the problem of disarmament, invariably taking the initiative in quests for ways of solving this difficult problem.

The CPSU programme approved at the XXII CPSU Congress states that: "A drastic way of guaranteeing stable peace is universal and complete disarmament under strict international control. Imperialism has foisted upon peoples an unprecedented burden of arms. Socialism sees its duty to mankind in saving it from this senseless waste of national resources.

.... Peoples can and should compel the imperialists to disarm by their active and decisive struggle." [1]

On March 15, 1962 the Soviet government submitted for consideration before the Eighteen Nation Disarmament Committee a draft treaty on universal and complete disarmament under strict international control. For the first time in the post-war years it was not a working document, or a memorandum or an announcement that was being put forward, but the draft of a definite treaty which encompassed the entire process of disarmament from beginning to end. [2]

The draft treaty proposed by the Soviet Union was not accepted and at the same time there emerged a possibility of concluding a

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1. The Materials of the XXII CPSU Congress. Moscow, 1962, p.363
2. Fifty years of the USSR's struggle for disarmament. Collected Documents. "Nauka" Publishers, Moscow, 1967, p.10.

a number of agreements to solve individual disarmament questions. A period of negotiations on disarmament questions began. A number of important draft agreements were worked out during these negotiations, many of which were approved and signed by tens of states.

In March 1973 at the XXIV Congress, General Secretary of the Central Committee of the CPSU, L.I. Brezhnev promulgated the peace programme. The realization of this programme will not only establish peace more firmly and cut down senseless expenditure on armaments, but will bring mankind considerably closer to resolving the main problem in which all the peoples on our planet are interested, that of universal and complete disarmament.

What are the first steps that must be taken on the road to nuclear disarmament? A number of steps in that direction have already been taken, but we must go on, we must not waste any time and we must not look back.

What steps have been taken and what should the next steps be?

First of all, it should be recalled that in 1963 a treaty was concluded, banning nuclear weapons tests in the atmosphere, in space and under water.

Not only did the contamination of environment with radio-active substances begin to cease after this treaty was concluded, but also the further development of nuclear weapons was considerably limited, although this treaty did not ban underground tests. It should be recalled that the Soviet Union has always been in favour of discontinuation of all nuclear weapon tests, including underground ones.

Later on, during the Soviet-American summit meeting in Vladivostok, both sides came to the conclusion that the main policy specified in the 1972-1973 documents must be firmly sustained and realized.[1]

Among the new agreements signed during this meeting a special place is occupied by the treaty on the limitation of underground tests of nuclear weapons, for this treaty is the first step in the discontinuation of the arms race, not only quantitatively, but also qualitatively.

The treaty envisages the complete discontinuation by the USSR and the USA of underground nuclear tests of more than 150 kilotons by 31 March, 1976.

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1. On the Outcome of the Third Soviet-American summit meeting". The newspaper "Pravda", July 6, 1974.

Moreover, each of the sides will limit underground tests of nuclear weapons to a mimimum number.[1]

By the beginning of 1968 the main provisions of the treaty on non-proliferation of nuclear weapons had been worked out; on June 1, 1968 the treaty was ready for signing and it went into force on March 5, 1970, after it had been ratified by 43 countries, including three nuclear powers, the USSR, the USA and Great Britain. This treaty is to prevent a further horizontal proliferation of nuclear weapons.

It would be extremely important for disarmament if all nuclear weapons tests were to be banned completely. This would halt a further development of nuclear weapons and stop work to create weapons of this type. The discontinuation of all testing (without any limitation) will bring about a halt in research and experimental and construction work. Without testing, it will be difficult to judge to what extent the principles underlying new weapon designs can be realized in practice. Moreover, no military organization will risk accepting a weapon that has not been tested.

But where should disarmament begin? Formerly many different views were expressed and many proposals put forward. In the draft treaty on universal and complete disarmament presented to the Eighteen Nation Disarmament Committee by the Soviet delegation in March 1962, the elimination "of all means of nuclear weapons delivery" was proposed, for example. This was intended to bring about the first stage of universal and complete disarmament. If it is impossible to deliver a bomb to its destination, then it will represent a danger primarily for those countries where it is kept. This also takes care of the question of a sudden attack.

The question of the abolition first and foremost of the means of delivery was discussed at the IX Pugwash Conference at Cambridge late in August, 1962. At that time this proposal started off a heated discussion, both at the Committee of 18 states and among members of the Pugwash Movement, particularly of the questions of what could be considered means of nuclear weapons delivery. The question of not being the first to use nuclear weapons is not a new one (although it bears no direct relation to nuclear disarmament and is related rather to the method of conducting military operations).

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1. The Treaty between the Union of Soviet Socialist Republics and the United States of America on the Limitation of Underground Testing of Nuclear Weapons. (Articles 1, points 1 and 2). "Pravda", July 5,1974

This question was twice raised within the framework of the Pugwash Movement, in September 1968 at the XVIII Pugwash Conference in Nice and for the second time at the XXII Conference in Oxford. But this question did not attract much attention, and its discussion was limited to a few remarks by two or three participants. At present, after the signing on June 22, 1973 of the agreement between the Soviet Union and the USA on the prevention of nuclear war, another question has become extremely important, that of getting other countries to sign this agreement so that it becomes universal.

At the same time, it is legitimate to raise the question of the next steps (and not the first steps) to be taken in the field of nuclear disarmament. We believe that besides the above-mentioned complete discontinuation of all nuclear weapon tests, including a complete termination of underground tests, such steps might be as follows:

1. Dismantling of military bases on foreign territory. It is common knowledge that this question is an extraordinarily pointed one and is constantly a subject of controversy.

2. Limitation of strategic arms. Bilateral negotiations in this field are in progress, but the scientists can make their own contribution as well.

3. Cut in military budgets and above all in the appropriations for military research and development projects. As a result of cuts in the expenditure on scientific research for military purposes, it would be possible to allocate considerable sums to working out measures for the protection of the environment and for other tasks which are extremely important both for individual countries and for mankind in general.

4. The prohibition of modification of the natural environment for military and other purposes hostile to mankind. Taking into consideration the rapid progress made by science and technology and the possibility of fatal effects on the weather and other natural phenomena, it is extremely important to conclude an international agreement to prohibit categorically such modifications.

At the XXIX Session of the U.N. General Assembly "the Soviet Government raised the question of the need to eliminate the danger caused by modification of the natural environment and climate for military and other purposes which are incompatible with the interests of guaranteeing international security and welfare and health of people", and presented the draft of an appropriate agreement. This extremely important international agreement should be approved at the earliest date.

5. Discontinuation of all research into the development of new types of weapons of mass destruction.

We must put a halt to all research into new means of mass extermination and of annihilation of the culture of mankind.

25th Pugwash Symposium
A New Design towards Complete Nuclear Disarmament
(the Social Function of Scientists and Engineers)
Kyoto, Japan. 28 August - 1 September 1975

V. Pavlichenko (USSR)

XXV-28

MORAL RESPONSIBILITY OF SCIENTISTS IN CONNECTION WITH THE DEVELOPMENT OF WEAPONS OF MASS DESTRUCTION

Many fields of modern science and technology are directly or indirectly connected with the development of weapons of mass destruction.

The analysis of the development of scientific research conducted both in the past and present provides numerous examples of this connection. This refers mostly to such sciences as physics, chemistry and biology, but this does not mean that other sciences are not involved in the production of weapons of mass destruction.

The military industrial complexes that were formed in a number of countries invest enormous sums in military research, and make use of all the opportunities offered by modern science and technology to develop new types of weapons.

In 1974 the sum total of spendings on arms throughout the globe was 250,000 million dollars.

In 1973 some 400,000 scientists and engineers were directly engaged in military research and "every fifth scientist worked for military purposes", the French professor Legay disclosed at the International Symposium held in Moscow in July 1975. "Modern types of weapons can be produced only under the supervision of highly skilled engineers at factories equipped with the latest industrial control-and-measuring instruments. The production of modern weapons requires various, extremely high quality materials. This naturally involves tremendous expenditure, both at the factories where the weapons are produced and at the factories supplying materials for them. This in turn requires tremendous outlays and large numbers of qualified personnel.

Scientific research for military purposes swallows up huge sums, and scientists are diverted from activities of benefit to society, using their knowledge to improve weapons and to find new ways of creating various types of weapons of mass destruction.

The English scientist Robin Clarke writes that the outlays on research in the military field are at least 12 times greater than

those for civic purposes. Thus, for example, in Britain where the most intensive military and industrial research in the world was conducted between 1946 and 1965, 62.2 dollars were spent on military research for every 100 dollars worth of military equipment purchased. Whereas in civic industry similar expenditure on research was only 4.9 dollars for every 100 dollars worth of goods produced. R. Clarke claims that in the USA the corresponding outlays were 54 dollars for research in the military field, and 7.5 in the civic. In France the figures were 51 and 1.9 dollars, respectively.[1]

Despite the claims of apologists of the arms race, science in general does not develop more rapidly as a result of this, but is held back. Huge sums are diverted into military research . This stimulates the arms race, and makes the development of scientific research one-sided, suppressing a great deal of highly important research which is of no military significance. " Research into the application of atomic energy for peaceful purposes has been impeded by research into the development of nuclear weapons", Professor Legay notes in his report at the above-mentioned International Symposium in Moscow. Fruitful progress of science is unthinkable without the development of scientific contacts and ties. This is plain truth. The possibility of using some of the results of scientific work for military purposes means that they become "secret" and the publication of such work is prohibited, a fact that is pointed out by many authors in books[2] and by scientists in their speeches at scientific forums.

In these publications there is much evidence of the pernicious effect of "secrecy" on scientific research for scientists carrying out research which might be of interest in the production of arms and of the fact that this leads to growing suspicion. Professor Legay drew attention to this fact at the Moscow International Symposium.

Quite naturally, "secrecy", supervision of the work of scientists by controlling bodies do not facilitate creative activity, and the narrow framework of a programme directed at using the results obtained purely for military purposes, intensifies the negative influence.

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1. Robin Clarke. The Science of War and Peace. London. Jonathan Cape, 1971, p.193.
2. E.g. Cf. the books: J.J. Liberman, "The Scorpion and the Tarantula". Houghton Miffin Company, 1970; Robin Clarke, "The Science of War and Peace. London. Jonathan Cape, 1971; Noel Pharr Davis New York. Simon and Schuster, 1968.

The fact that scientists are drawn to military subjects means that many peaceful fields of science which await fresh scientific and engineering ideas, cannot be further developed and improved. Therefore reference to the fact that atomic science and technology was only developed because it was used for military purposes, and also that missile technology stimulated the development of computers in radio engineering and electronics, cannot serve as a proof. Only the particular wartime conditions, the danger that fascist Germany would create nuclear weapons and the fear that atomic weapons would be produced, compelled leading scientists to mobilize their forces and abilities to solve this task.

The well-known physicist Eric Burhop, the President of the World Federation of Scientific Workers, says: "During the war I worked on the Manhattan project. Like many of my colleagues I considered it my duty to do everything in my power to prevent the victory of fascism with its antiscientific ideas of irrationalism and its mystic concepts of the propagation of force and racial supremacy. Many of us were stunned by the nature of the weapon we had created.

Immediately after the Second World War I joined the campaign to ban nuclear weapons, for disarmament, and tried in every way possible to make a contribution to this struggle." [1]

A number of scientists who participated in the creation of the first A-bomb, later took part in the struggle for a ban on nuclear weapons. Leo Szilard stressed that by 1943 it became obvious to the scientists that the atom bomb was not destined for the goals for which they, the scientists, had intended it.

In this particular case the scientists had been deceived by those who were in charge of the project to create atomic weapons and who, playing on the lofty moral feelings of the scientists, plotted the ignoble plan of checking the progress of civilization. But, unfortunately, there are other examples illustrating that people of science knew what inhumane ends the contemplated projects served, but neverthless they not only assisted in the realization of these projects but all too often were the initiators of their development and implementation. It is no accident that the new concept of the

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1. Eric Burhop: Scientists - for/in favour of disarmament. "New Times", July 6, 1975, p.17.

military industrial-scientific complex came into being, and articles about the inadmissible activities of such scientists appeared in the press.

"Science, mankind's greatest treasure-house, is increasingly becoming a fright to people", and ordinary people are beginning to grumble that scientists are responsible for all disasters.

Is this really so?

No ! But one cannot help agreeing with E. Burhop when he says: "The work of scientists has played a very important role in the development of the most frightul modern weapons. Therefore, scientists bear special responsibility. But it is society that decides what weapons must be manufactured and how much money should be spent on armaments. Everyone should share the responsibility, and it is no good shunning this responsibility and blaming the scientists for everything".[1]

It is no accident that the question of ending the arms race and eliminating the threat of nuclear war is linked with that of the possible influence of scientists in solving these problems and of their contribution to the solution thereof. The arms race underway in the world is being conducted in horizontal and vertical directions, i.e. on the one hand, there is the quantitative race, the stock-piling of atomic weapons of tested military types, and on the other hand, the qualitative race, the working out of new means of warfare. Although scientists cannot essentially influence the first process, the second process cannot go ahead without their participation.

At the World Congress on univsersal disarmament and peace, M.V. Keldysh, President of the USSR Academy of Sciences, expressing the thoughts and aspirations of Soviet scientists, stressed that today the scientist has no right to shut himself up in that sphere in which he works and renounce social work as something alien to and incompatible with science...

... Scientists cannot and do not have the right to become the slaves of aggressive forces. Scientists should be well aware not only of what is required of them, but they should realize for whom and for what the results of their research are needed. And we can see that these questions are bothering scientists throughout the world more and more frequently."

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1. Ibid.

One cannot help recalling the conference in Japan in May 1962, held on the initiative of three well-known scientists, the physicists and Nobel Prize Winners, Hideki Yukawa and Shinito Tomonaga, and Shoichi Sakata. Outstanding Japanese scientists, physcists, lawyers and economists took part in this conference.

They announced at that time that at the present stage in the development of society, the question of preservation of peace on Earth demands that mankind concentrate all its intellectual might on reaching an agreement on universal and complete disarmament.

"Reaching an agreement to create a world without weapons", said the Japanese scientists, "is a great historical duty of mankind. Man's intellect should now be used to achieve this goal."

Soviet scientists share the ideas and considerations of these Japanese scientists.

Hence, fresh problems relating to the fundamentals of human morals and conscience arise. For what purposes are weapons created, whom and what do they serve - a real scientist, i.e. man endowed with intellect, capable of thinking and coming to conclusions and whose actions are not thoughtless, cannot get away from these questions in his activities, so the question of responsibility for his actions arises.

All aspects of the responsibility of scientists have been discussed many times and from many angles.

Leading scientists were forced to participate in the creation of the atom bomb because of the danger that Hitler's Germany would succeed in creating it first. The scientists' motive was their awareness of the impending danger to mankind and the desire to avert it.

What are the reasons now for the further development of nuclear arms and their stockpiling? "Stable peace cannot be achieved, if all countries produce and accumulate all the high-yield and expensive weapons in ever increasing quantities. Peace cannot exist when a social status and political system that they do not desire is forced upon them," Professor Legay justly stated at the International Seminar in Moscow in July 1975, and one cannot but agree with this.

"In our eyes, peace is the greatest blessing towards which people should strive, if they wish to make their lives worthwhile", said L.I. Brezhnev in his speech on American television in June 1973. "We believe in commonsense and trust that the peoples of the United

States of America and other states share this belief. If this belief were to be lost, if it were to be replaced by blind hope in force alone, in the power of nuclear or some other weapons, then a sad fate would await civilization and even mankind itself." [1]

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1. L.I. Brezhnev. On the Foreign Policy of the CPSU and the Soviet State. Speeches and Articles. "Politicheskaya Literatura" Publishers, Moscow, 1973, p. 532.

25th Pugwash Symposium
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XXV-29

An Approach to Total Nuclear Disarament: A Three-Stranded Rope

It is no secret that many obstacles block the path that leads to total nuclear disarmament. Indeed, among 'experts' there exists a virtual consensus at this time that these obstacles are insurmountable and, hence, that no plausible way exists to reach the desired destination. Instead these experts propose concentrating upon other less grandiose destinations that can be approached by other paths. Among those experts deeply concerned about the dangers of present arms policies are many who advocate taking a path that leads toward "meaningful arms control," by which is meant a cheaper, safer military setup, but one that continues to leave in being nuclear capabilities of some consequence under the exclusive control of national governments, although preferably as few as possible. Sometimes, the final destination envisioned for the arms control path is described more ambitiously by reference to goals of "minimum deterrence" or "partial nuclear disarmament." The path that leads to such goals is also, we are properly warned, filled with obstacles that most experts regard as almost equally insurmountable, but unlike the advocacy of total disarmament, these lesser goals have the great advantage of being reconcilable with traditional conceptions of "national security." Their advocacy can be cast in terms of

relative "safety," of "costs," of "levels of damage," and of "stability." Despite this feature of arms control advocacy it is crucial to notice that arms control advocates have consistently lost the principal debates over the past thirty years about the requirements of "national security" in the nuclear age, and not, it is scarcely necessary to add, because its proponents have had the weaker case. These debates have been lost most obviously because of the array of entrenched and powerful bureaucratic and economic interests that favor a dynamic approach to "security" that accepts as gospel both "worst case analysis" and the conviction that since technological momentum is irreversible, it is best to rely for stability upon the free play of competitive forces.

But arms control advocates have lost these national security debates, also, for far more fundamental reasons, often for reasons about which they appear unaware because they take for granted the logic and framework of the state system as it has evolved over the past several centuries. Within this logic maximum force capabilities are almost always beneficial for the most powerful states in the system, not so much to assure their security as to maintain their dominance in a geopolitical sense. That is, until we grasp the imperial underpinnings of the foreign policy of the nuclear superpowers in particular and of Great Powers in general, it will be impossible to appreciate how difficult it is to devise a therapy to treat what one distinguished survivor of Hiroshima, Professor Ichiri Moritaki, has aptly called "the nuclear disease."

My argument is structural rather than ideological. The

imperial dimension of world politics engenders definite consequences that make any substantial weakening of military power by dominant states very unlikely to occur, and makes it almost implausible as a policy objective. The governments of these dominant states seek to preserve their options above all else. Of course, even superpowers would rather achieve their objectives without war, and would like to avoid using or threatening nuclear weapons, especially against one another. The United States tried in two Asian wars to rely on its non-nuclear capabilities, achieving a costly stalemate in the Korean War and receiving a punishing defeat in the Vietnam War. There are many indications that American policy-makers are responding to this experience by wheeling the nuclear cannon into place (rather than by cutting back on geopolitical commitments) both to reach their objectives without fighting in yet another Asian land war and to demonstrate for the first time since Hiroshima that an American willingness to use nuclear weapons is a decisive weapon in military conflict. It is at least notable that the present American Secretary of State, Henry Kissinger, initially achieved public prominence back in the late 1950's by proposing greater American willingness to employ nuclear weapons in limited war situations, a prominence that provided a model for film-maker Stanley Kubrick for the character Dr. Strangelove ~~in~~ in the movie bearing the same name. It would be amusing, if it were not so ominous, that despite these impeccable nuclear credentials, Mr. Kissinger has emerged as a virtual nuclear

coward compared to the Secretary of Defense, James Schlesinger. It is Mr. Schlesinger who has let it be known that the United States regards the nuclear option as fully available to it even against a non-nuclear opponent, as in the context of a new war on the Korean Peninsula. Such nuclear bravado is certainly something that augurs badly for the future, but it typically expresses statist logic which has consistently manifested a Machiavellian spirit of ruthless amorality for the sake of national gain and proudly defended this approach to national policy as 'realism." And since it is quite plausible to believe that North Korea will be inhibited by the propsect of an American nuclear response or quickly defeated if it is not, then it is hardly surprising that Pentagon planners in the aftermath of Vietnam should hit upon the nuclear option as a quick-fix for America's sagging geopolitical position. It would be a mistake to think that only the United States poses a nuclear threat. The openness of American society makes the threat better known than that issuing from other nuclear capitals. Soviet behavior is hardly reassuring. For instance, recent studies show that the latest Soviet naval vessels seem designed to facilitate nuclear first strikes, rather than to stress survivability features needed to sustain an image of retaliatory capacity.

But it is not only the superpower end of the spectrum that will be reluctant to diminsih its nuclear option in a statist world. It will also be any weak state that feels seriously threatened and yet possesses the means to achieve some nuclear

capability. Is it really implausible for an Israeli stateman to believe that the nuclear option, however desparate its invocation might eventually prove, is the thin line that may yet separate "security" from "annihilation"? Or for that matter the beleaguered minority leaders of South Africa? The prevalence of war is an inevitable incident of the state system with its absolutist claims to control people within fixed territorial boundaries. Such absolutism does not, as a matter of principle, shrink from destructive consequences, and as historical evidence supports, not even from nuclear consequences. In this regard, it is crucial to distinguish "prudence," even "moderation," as bureaucratic goals of what Richard Barnet has called "the security managers" of the nuclear age from the retention of discretion to use nuclear weapons where necessary to sustain what a given, and often unrepresentative governmental elite, perceives to be a vital interest. The possibility that such an occasion of perception might in the future arise for a government reinforces the inertia already present in the state system, the inertia expressed in a refusal to consider total disarmament seriously despite the burdens and dangers of the war system.

And yet for all its plausibility on the level of statist logic, it is madness on the level of biosocial destiny. The psychohistorian, Robert Jay Lifton, who has constructively studied the deeper meanings of the nuclear experience for more than two decades, writes of "a peculiar madness lurking

beneath the logic of international negotiations concerning who may make, test, and perhaps use how many nuclear bombs." This peculiar madness is nothing new. It long antedates Hiroshima, but its full extent was disguised earlier by centuries of statist propaganda that included the glorification of war. Governments, especially of the powerful states, have shown almost no capacity or inclination to rally their peoples around the risks of peace and a genuine peace system. That India, the society in which non-violence has had its greatest modern triumph, should join the nuclear club is not nearly so much a sign that India has succumbed to temptation, as that it has conformed to the structure of statism. Looking at the world from the perspective of an Indian statesman, I can find no compelling reason for India to forego the nuclear option. In this regard, non-proliferation is either a phantasy or, as the Chinese sometimes contend, a superpower plot. It is probably by now better perceived as a phantasy, the decisive threshold perhaps being the failure of either the United States or the Soviet Union, despite evident contemplation in the early 1960's, ~~of~~ to launch an air strike to destroy China's nuclear facilities in Sinkiang.

Having identified this peculiar madness associated with statism, it is now necessary to return to political terrain. Despite their madness, it will be principal nuclear governments ~~that~~ who will determine what "security" is to mean for the world in the decades ahead. Of course, lesser governments, even non-governmental actors, may engage in behavior that produces a

crisis or catastrophe that reshapes the prevailing climate. But the most realistic forecast is that despite a variety of pressures on the state system leading to the steady erosion of national sovereignty for most states, there will be no structural change in the status of war in world affairs.

Under these circumstances the main question is whether there are some ways to deal with this peculiar madness that are better than others. Without taking the psychiatric metaphor too literally, I think it is clarifying to admit that we have no hope of devising a cure without achieving "a medical breakthrough," but that there are various ways to reinforce the prudence of the patient while searching for the breakthrough. It is within this dual framework that I believe creative efforts should be concentrated. In my view it is helpful to distinguish sharply among three interrelated and mutually reinforcing approaches to nuclear issues:

(1) Arms control;

(2) Total disarmament;

(3) Drastic global reform

Let me, briefly, indicate the role of each line of advocacy and then conclude with some comments about their mutual reinforcement.

(1) Arms Control. It remains correct that there exists some debate within the structure of the state system that has important consequences for the severity and character of the nuclear danger. To note that the statist structure virtually precludes "sanity" on the nuclear question is quite consistent

with attempting to arrest the "disease" or control the patient. At various points in recent international history leaders in key countries have been receptive to arms control initiatives that will promote the cause of world peace, reduce the economic burden of armaments, place some ceilings and limits upon technological initiative of a militarist sort (e.g. outer space, seabed, Antartica). Domestic changes in key countries may carry these possibilites further in the future, especially if public opinion becomes focussed on arms policy issues.

Some arms control measures seem sensible within the prevailing logic and may give more time to those of us who believe that the only real basis of hope rests in creating a new logic that dramatically changes the terms of debate. Various no first use measures and nuclear free zones move in this direction. What I believe is detrimental is to suppose the sufficiency of arms control approaches. It may truly be the only way to talk to those in power, but it is not the only way to talk, nor is it a convincing way to talk, given the character of the nuclear danger and the very modest contribution of arms control measures to its reduction despite a long testing period.

At the same time, arms control advocacy remains <u>necessary,</u> to combat the worst tendencies of nuclear statesmanship, to build support for moderate positions, to sustain prudence, and to make segments of public opinion feel that it is not futile to strive for a peaceful and just world system.

(2) <u>Total Disarmament</u>. Pressure for total disarmament,

especially when it comes from militarily weak countries and from non-governmental circles, puts forward a basic human demand for a peaceful world. It mounts a challenge against the war system which remains the chief bulwark of geopolitics. The case for total disarmament also rests upon an implicit confidence in the potential cooperative capacities of individuals and groups, and hence challenges one tenet of statist logic--the inherent selfish and aggressive quality of human nature.

In the aftermath of catastrophe, even national leaders purport an interest in disarmament, but mainly, it seems, to pacify the cravings of people for enduring peace. Governmental advocacy of disarmament in this century has been rightly perceived, I think, as mainly an exercise in public relations or propaganda. No government has yet put forward a disarmament proposal that its adversary ought to accept, nor has it prepared its own public opinion for such a reformulation of "security," nor has it initiated the sort of studies needed to make disarmament commitments credible. As far as I know, the US Arms Control and Disarmament Agency, despite a fairly large research budget, has devoted very little attention to disarmament, and almost none of it to favorable interpretations. Its only major study of disarmament was carried out on a contract basis by a group of extreme statists who arrived at the expected (and not unpersusasive) conclusion that, given the world of states, of statist logic, of self-seeking human beings, it would be contrary to America's national interests to encourage a serious process of disarmament.

My point is that genuine advocates of disarmament exist,

but cannot be recruited from statist ranks. These advocates accept a different set of priorities, identify human needs and well-being in non-territorial terms, and regard the dangers of war and the cost of the war system as outweighing by far the contributions made by national military establishments to the cause of "security." Such advocacy proceeds from a different logic, a logic we might label as humanist to distinguish it from the prevailing statist logicl. Even if this humanist logic is feeble within the realms of bureaucratic power its position draws on other sources of strength, including the fundamental biosocial will to survive. By putting forward claims for disarmament on an authentic and serious basis there is exposed this clash of logics and it makes more difficult the effort of governments to confuse people by appropriating the rhetoric of the humanistlogic to obscure the contrary practise of statism. We live at a time when such confusion is widespread, provoked in part by the globalist implications of modern economic and ecological concerns which leads even statesmen to takeroutine note of the imminence of the transition from a state system to a more centrally guided global system. But such globalist rhetoric is deceptive and may convince large segments of public opinion that governments continue even in a post-statal phase of history to be capable of meeting the challenges confronting human society.

But the advocacy of disarmament as a distinct goal, although necessary, is also not sufficient. It undervalues the links between violence and change in human experience, and, therefore, seems to endorse a grossly inequitable status quo

with respect to economic, social, and political well-being. Back in 1867 the great anarchist thinker, Bakunin, understood that "the people everywhere. led by their admirable good sense as well as by their instinct, have realized that the first condition of their real emancipation or, if I may be permitted to use the term, their humanization, was, above all, a radical reform of their economic condition. The question of daily bread is for them the principal question, and rightly so.." /p. 1147 In contemporary terms, issues of poverty and repression must be resolved coincident with the quest for total disarmament. Just as the state system is wedded to militarism so it is also structurally related to poverty, repression, exploitation. It is not possible to sustain the affluence of the few (whether measured individually or collectively) except by the poverty of the many and it is not possible to obtain over time the acquiescence of the weak except by the impositions of the strong. The "limits to growth" critique of industrial society has at least served notice that liberal commitments to spreading the wealth around by increasing the total economic pie so that in due course the world as a whole would be affluent is an ecological phantasy, the acceptance of which may be more dangerous to human well-being than even the nuclear menace. Hence, it seems necessary to dilute the attractively simple focus of disarmament advocacy by a wider program for global reform.

(3) Global Reform. The case for global reform follows closely from a structural indictment of statism. It also can draw some support from interpretations of the present historical period as one of transition from the state system to some yet undetermined post-statal form of political

organization. Because this future is undetermined it is also an arena of struggle among contending social forces, not all of them progressive in the cardinal sense used here--that is, of being congenial with the postulates of humanistic logic. There are, of course, varying programs for global reform proceeding from a variety of normative positions. I have found that the values endorsed by the World Order Models Project offers the most adequate expression of what a humanist logic entails for salient social problems of world society. This Project has developed a series of distinct models of global reform from a variety of cultural, ideological, and regional outlooks including Japan, USSR, USA, Latin America, Africa, India, and Europe. But each group accepts a common normative framework, established by four values: peace, economic well-being, social and political justice, and ecological balance. These values correlate with the main social problems of war and militarism, poverty and inequality, repression, and environmental decay and resource depletion.

An adequate movement for global reform requires three elements: (1) a critique of the present system; (2) a vision of a desirable alternative future system; (3) a transition strategy by which to transform the future vision into an active political possibility.

By what I have argued earlier, the bias of the transition strategy I advocate is populist and anti-bureaucratic, seeking to arouse and orient public consciousness and to mobilize transnational pressures around a program of reform committed to the realization of the four world order values described above.

In my view, only a movement of this kind of depth and breadth has any realistic prospect of devising a cure for the nuclear disease. Even such a vision is no guarantee. It is not, in any sense a utopian quest for the best of all possible worlds, but represents a search for the most attainable world system expressive of the basic claims of a humanist logic. This system would be evolved in the course of its becoming; it cannot be blueprinted in advance without denying the creative role of active historical forces and without degenerating into a mere appeal to heads of states (or ruling groups), an appeal which, for structural reasons, is bound to fall on deaf ears. What I do envisage is an organizational movement that simultaneously builds outward from the state and downward within or beneath the state; a dialectic, if you will, between centralizing and decentralizing energies, between universalism and localism. In political terms it can be expressed as a move toward political confederation (an enhanced United Nations) and international functionalism (specialized agencies entrusted with the functional needs of an interdependent world) on a global level and communal and libertarian socialism on a national level.

Of course, it is easy to be skeptical and discount any propsect of breaking out of the present bind. I was struck by a passage at the close of a short essay by the Japanese writer Kobe Abé that captures my mood:

> ..to recover the world from the state I believe we have no choice but to try creeping through those secret passages. Of course, one cannot at once speak of hopes. But as Lu Hsün, the great Chinese novelist, once said, if hope is no more than a delusion, despair is equally a delusion. /NYT, June 11, 1975, p. 43/

I believe that we are faced by a desparate situation, but not a hopeless one. The best way to shift from statist logic to humanistic logic, without passing through an awful period of trauma, from which we may never recover, is to adopt an intensely difficult position on matters of thought and action--to avail ourselves of every resource for prudence afforded by the state system while acknowledging and committing ourselves to supercede that logic. It is on this basis that it is important to pursue the goals of arms control, disarmament, and global reform as parts of an integrated program of political therapy, rather than attempt to choose which alternative strategy offers the best short-term and long-term prospects.

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(the Social Function of Scientists and Engineers)
Kyoto, Japan, 28 August - 1 September 1975

Wm. C. Davidon (USA)

XXV-30

WE CAN HELP STOP THE PROLIFERATION OF NUCLEAR WEAPONS

In all but three of the ninety-six countries which have ratified the Treaty on the Non-Proliferation of Nuclear Weapons, each present and future nuclear reactor and isotope separation plant is covered by international safeguards to insure that all fissionable material is used only for civilian purposes. However in the U.K., U.S. and U.S.S.R. as well as in many countries which have not yet ratified this treaty, reactors and separation plants are either currently producing bomb materials or have the potential to do so.

Everyone's security would be increased by an internationally supervised cutoff of all further production and stockpiling of weapon grade plutonium and highly enriched uranium. While such a cutoff has been discussed in disarmament negotiations, it appears to be receiving less attention now than at some past times. In view of the enormous stockpiles of nuclear explosives which now exist - with an energy yield thousands of times the total of all bombs and shells used in all wars of human history - such a cutoff would not by itself significantly reduce the threat of nuclear war. It would still, however, be of considerable value. It would encourage more countries to ratify the Non-Proliferation Treaty by reducing its unequal treatment of states with and without nuclear weapons. It would strengthen the existing international safeguard program by extending it to include the nuclear weapon states. It would discourage the deployment of new weapon systems and strategies that require large additional amounts of nuclear explosives.

If we are to make real progress in time to prevent nuclear catastrophe, it is not enough for us just to urge governments to negotiate treaties bringing all nuclear reactors and separation plants under the international safeguard programs that now apply only to some. We can join with others in opposing any further construction, operation or export of reactors or separation plants not covered by international safeguards insuring that no fissionable material can be used for nuclear weapons. Some specific actions we can take, depending on

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our positions, local situation and national policies, include:

* Refrain from working at any nuclear facility capable of making bomb materials unless international safeguards against such use are in effect.

* Oppose the export of nuclear reactors or isotope separation facilities to countries which have not ratified the Non-Proliferation Treaty.

* Explain to others how weapon grade plutonium and uranium differ from other forms produced and used in nuclear reactors, and how safeguards can insure against diversion of fissionable material to weapon use.

* Provide scientific and technical support to citizens' organizations which oppose the construction and operation of nuclear reactors not covered by international safeguards.

* Help alert the public to the dangers from existing stockpiles of nuclear explosives - more than half of which are probably in the U.S. - and to the need for stopping further production of them.

* Encourage our colleagues and scientific organizations to join with us in actions such as these, and to support others who act along these lines.

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Kyoto, Japan, 28 August - 1 September 1975

D. Senghaas (FRG)

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ARMAMENT DYNAMICS AND DISARMAMENT

1. Armament and Disarmament Problems of Our Time

The public discussion on armament and disarmament is concentrated - very similar to the scientific one in peace research - on the relations between the two superpowers, the U.S.A. and the Soviet Union, as well as on the problems of Central Europe.[1] The SALT talks on the limitation of nuclear strategic armaments, the MBFR talks on measures to control conventional armaments in Central Europe as well as the disarmament discussions held for years in Geneva have been essentially confined to the classical inter-state armament and disarmament problems of highly industrialized societies. Considerations on armament and disarmament, however, have to cope with all essential dimensions of the present problems of militarism.[2] With respect to their actual scope they can only be listed here abbreviatively. They are expressed in the following phenomena of national and international politics:

1. in an uninterrupted quantitative and qualitative nuclear strategic armament policy;
2. in an uninterrupted quantitative and qualitative conventional armament policy;
3. in a high innovation of the so-called counter-insurgency warfare (against national liberation movements, uprisings etc.).

These types of armament policy are based on intensive military technological research expanding to all regions (oceans, space, jungle etc.);[3]

4. in considerable rates of growth in international arms trade and transfer;
5. in a more intensive production of war material in the countries of the Third World, especially in the so-called sub-centres;
6. in manifest belligerent conflicts (such as between the Arab states and Israel);

7. in colonial wars (such as in the Portuguese colonial rule in Africa);
8. in quasi-colonial wars (such as in South-East Asia and in other places of the Third World);
9. in military coup d'états (such as in Chile);
10. in the militarization of internal societal conflicts, for instance, in the use of counter-insurgency strategies against civilians by elite power groups.

This brief outline of some dimensions of the present problems of militarism already shows clearly that the fixation on the great powers and Central Europe as well as the fixation on inter-state dimensions of the armament and disarmament problems would mean an important restriction of the analysis. The highly industrialized countries of the North and some sub-centers in the Third World (such as South-Africa) are, of course, the dynamic poles from which decisive militarization effects are spreading to their own areas, the respective regional surroundings, and to the world in general. While considering the state and development dynamics of the present international society it becomes , however, clear that political, military and socio-economic phenomena which do not necessarily fit into the usual picture of military and especially symmetric inter-state confrontations, have to be taken into account in an analysis of the present armament and disarmament problems.

In order to arrive at an adequate understanding of this situation, the armament and disarmament problems have to be seen in connection with violence structures; that means that the actual role of armaments as well as the potential role of disarmament strategies have to be determined within the context of direct and structural violence

patterns. Analyses of the present armament and disarmament problems have to express clearly that armaments of all kinds are instruments of violence having a vital function in the preservation or alteration of the status quo between states (which is full of competitive conflict potentials) as well as in the preservation of patterns of structural violence (of exploitative and unjust dominance systems). The latter observation conclusively leads to the thesis that military machineries have to be considered in connection with and within the framework of a spectrum of so-called public order functions which also embraces the police and para-military organizations. The use of military instruments in internal social disputes being first tested in external belligerent conflicts, (as in the case of the highly differentiated instrumentary of counter-insurgency) emphasizes paradigmatically the not clearly defined transitions between the organizations maintaining internal law and order, such as the police, on the one hand and the army on the other, as well as the lack of a succint transition between their concrete functions.

The obstinacy with which armaments are continuing to develop in highly industrialized nations in spite of the really obvious détente between East and West also requires new considerations on the role and function of armaments and on possible disarmament measures. It becomes more and more important to be aware of the symbiotic interlocking between armament developments on the one hand and societal processes and international structures on the other hand, but also of the at least partially observable relative autonomy of armament processes within the past few years.

An analysis of the present armament and disarmament problems, therefore, has to

1. grasp adequately the complex character of the present armament problems;

2. establish analytically the relation between this armament-complexity and the structures of peacelessness;
3. develop strategies of peace corresponding to the real dimensions and differentiations of armaments and peacelessness.

2. On the Complexity of Peacelessness and Armaments

In a different place we developed systematically the thesis that present-day international society is formed by the following conflict formations[4]:

1. the inter-capitalist conflict formation
2. the West-East conflict formation
3. the North-South conflict formation
4. the internal socialist conflict formation
5. the internal conflict formation in the Third World
6. the internal societal formations of structural violence

Being of macropolitical, macroideological, macroeconomic, and macro-military nature, these conflict formations structure decisively the present international society; they are constituted by more or less pronounced competitive and/or antagonistic incompatibilities of interest;and they have in themselves a whole series of more or less virulent conflict potentials. These again manifest themselves in concrete conflict manifestations - as demonstrated in Diagram 1.

As much as the structures of the above-mentioned conflict formations differ from each other, as much is the role of armaments different in them.

While some decades ago violent belligerent conflicts were quite common in the framework of imperialist conflicts (including two world wars)[5], this inter-capitalist conflict formation "sublimated" - not least because of the East-West contradictions - within the sphere of armament activities to such an extent that today belligerent conflicts between these Western capitalist metropolitan countries have nearly become unimaginable while their armament activities regarding their own region have changed into a competition on lucrative armament business affairs. In the place of hot belligerent conflicts, we observe a growing struggle for the sale of armament material[6]; to the extent to which a national armament production becomes impossible for most of the metropolitan countries - except the U.S.A. - because of the enormous increase in the costs of military research, development, testing, and production[7], stronger integrative processes for joint research and development as well as forms of transnational production of armament goods can be observed[8]; this may, nevertheless, not necessarily lead ever to complete super-nationally organized synchronization of the respective activities, since the competitive terms within the inter-capitalist conflict formation cannot be eliminated by ultra-imperialist organizational structures (to use an old term). The talk about "trade wars" which lately has again become popular and the problems arising from the reform of the world monetary system dominated by the leading capitalist countries, however, indicate more than only competitive, i.e. antagonistic contradictions of interests.

The West-East conflict formation represents a fully militarized conflict, in the final instance, however, an antagonism over different conceptions of social order. For two decades it has been attempted to check the existing political, ideological and socio-economic contradictions of interests by means of an extraordinary

Diagram 1: On the Concept of Conflict Levels (with selected examples)

Conflict formation	Inter-capitalist	West - East	North - South	Inter-socialist	Inter-Third World	Formation of structural violence within society
Conflict potentials	e.g. "trade war"	e.g. assuring the territorial status quo in Europe	energy transfer South - North	aspiration to leadership in the international socialist movement	sub-imperialist expansion policies	problems with foreign labour
Conflict manifestation	restrictive trade policy	Berlin crises	oil boycott	troup concentrations border conflicts	liberation movements	"wild" strikes

armament program within the framework of an international policy of deterrence. The combination of a deep political enmity and a policy of military stabilization built on the premises of deterrence led to a military contingency planning regarding all imaginable political cases and the military and technological weapon potentials corresponding to them.[9] For instance, in connection with the development of the Cold war an extreme differentiation of strategic doctrines and concrete destruction potentials took place. This development resulted in a quantitative and qualitative arms race without any visible end both on the nuclear strategic level and on the level of conventional warfare. The presently existing overkill capabilities can give us an indication of the unprecedented waste of investment in this type of security policy. The militarization of space and oceans, the efforts to put science at the service of the so-called national security imperatives, the increased activities of secret services, psychological warfare etc.: all these are - next to the already mentioned phenomena - an expression of the dimensions and scope of the militarization produced by this West-East conflict formation.

As this conflict formation has "spill-over effects" all over the world, it cannot be geographically restricted to the industrialized nations of the North. The massive and growing armament transfers from East and West to the South of the globe as well as the growing armament business between the capitalist industrial countries of the West and the peripheral countries of the Third World (armament trade, armament production under metropolitan licences etc.) indicate how closely interlocked the West-East conflict formation is with the North-South conflict formation just in the field of armament. This

is related to the fact that the contradictory armament activities induced by the Northern metropolitan states in the countries of the Third World are both to stabilize the there existing exploitative status quo (in the case of the activities of Western metropoles) and to contribute to its elimination (in the case of Eastern metropoles). These contradictory activities, which result in arming and counter-arming, must necessarily lead to local arms races, if the political commitment of the capitalist and socialist societies is as seriously and of the same size (as e.g. in the Middle East), while ordinary armament transfer outside competitive political constellations is to serve the stabilization of the existing local and regional status quo as can lately be observed especially in the massive political, economic and military promotion of the role played by the so-called sub-imperialist centers (such as Brazil, Iran etc.)[10].

While open military activities in the traditional spheres of West-East conflict formations, i.e. between the two superpowers - the U.S.A. and the U.S.S.R. - and within Europe would be suicidal, forcing the armament policy to adopt the character of an "arms race" of a special kind[11], armament activities are performed in the context of the North-South conflict formation (to be used really in case of serious threats to the stability of the international and internal status quo), respectively to assist in undermining this status quo energetically. Weapons, therefore, at present have functions in the North-South conflict formation which in other connections, as for instance in the East-West conflict formation, are today rejected on all sides. In the latter one, mutual deterrence at the level of a "military balance" seems to be the widely accepted basic maxim of the security policy[12];

open, armed military activity is considered to be irrational and counter-productive without, however, leading to a reduction of the ritualized armament activities at the level of overkill capabilities. In the first one, the North-South conflict formation, arms and the military machinery are still understood to be politically valid war fighting capabilities and used to reach political aims.

Regarding the internal socialist conflict formation two facts should be recorded: 1. the attempt at a division of labour in the execution of the security policy within the framework of the military alliance of the Warsaw Pact countries; 2. the growing militarization of the deep structural conflict between the Soviet Union and China which, as was mentioned elsewhere, shows very many features which were also decisive in shaping the increasingly militarized conflict between East and West after 1945. Apart from occasional open and violent clashes between the Soviet Union and China, so-called border incidents, there is a danger that the military conflict potential might develop a momentum of its own in this conflict formation and that an arms race might escalate with finally carrying similar features as the "arms race" between East and West: a security policy resulting more and more from autodynamically developing armament complexes and their rationales. That would mean that the traditional deterrent system within the framework of the West-East conflict formation would be supplemented by a further main deterrence axis, the one between the Soviet Union and China, within the inter-socialist conflict formation; and both main axes would have to be considered in a certain interlinkage, since in both conflict formations the use of violent military means for the achievement of political aims is causing potentially prohibitive costs and since belligerent force can no longer be regarded as a means of politics, although armament and military

machineries are - in their deterrent function on the basis of the predominant security strategies - still considered to be instruments of conventional interest policy.

The conflict formations in the Third World represent - apart from a few border cases, such as Southern Africa - less independent political patterns than patterns induced by conflict structures at higher levels. In many a way they are nothing but locally sedimented results and remnants of colonialism, imperialism and neocolonialism. This is especially true in cases of internal conflicts or in civil wars within societies of the Third World. One observation regarding the armament problems in this region, however, has to be expressed: the growing attempts to build up their own armament production establishments, already existing in some countries of the Third World which earlier were labelled as sub-imperialist centers. Activities of this kind are correlated to a new form of the international division of labour; i.e. a certain part of the present armament production plants which so far have been part of the armament business between the Western capitals and the countries of the Third World will, in selected cases, most probably become gradually transferred to a few sub-centers of the Southern hemisphere such as Brazil, Iran etc., on the basis of licence and technological transfer agreements, while the actual research and development work for the production of new equipment will still remain concentrated in the metropolitan countries. This type of military and technological division of labour also corresponds to the development of new forms of an international division of labour between the metropolitan and the periphery countries in the production of goods for civil consumption where we can see to a growing extent that the production of goods with high labour costs

and a low processing level is shifted from the metropoles to privileged sub-centers in the periphery. For that reason the outdated export structure (raw materials, agricultural goods) is gradually supplemented by an export of goods with a low processing level.[14]

The production of their own arms (armoured cars, small arms, partially aircraft construction etc.) on the basis of technological dependence can actually be chosen as indicator for the status as well as for the developing level of the periphery countries. These are the countries which according to the usual statistics on gross national product are most "developed" in the Third World; those receiving most capital investments from the capitalist countries; those showing high rates of growth; those ready to implement "law and order" in the region and, therefore, to perform the service of privileged bridgeheads between the metropoles and the peripheries; these are simultaneously also the countries in which the process of pauperization and marginalization has progressed most, in which (structural) unemployment is chronical and in which the political and social conflict potential is gradually growing sharper because of the increasing discrepancy between a few privileged poles of growth and an otherwise relatively stagnating or absolutely pauperizing society. From this context a stronger militarization in the double sense of sub-imperialism emerges: counter-insurgency within societies and within regions.[15] To put it briefly, these are the sub-centers in which structural violence can only be preserved by a stronger open application of direct means of violence (police and arms, torture etc.)[16].

No short description of the complexity of the present armament activities and their connection with the structures of peacelessness in international society can reproduce the complexity of the real state of affairs. Nevertheless, it seems important to us that such analyses should at least take the following dimensions into consideration:

1. the armament activity in the Western world promoting profitable capital realization there and in those parts of the international society which are controlled by Western metropolitan countries;
2. the, as we might already call it, classical arms race between East and West which gave rise to an unprecedented military-industrial-administrative-scientific complex forming the production basis of effective software and hardware weapon systems[17];
3. the increasing co-production of armament goods based on a division of labour within the groups of West-European and East-European states;
4. the creation of a new deterrent axis between the Soviet Union and China and the probable development of a quantitative and qualitative arms race between the two socialist great powers which in its structural development might become very similar to the East-West arms race;
5. the development of an independent military great power – China – and its possible readiness to play a more active political and military role on the continents of the South (so far that was not the case);
6. armament business and armament transfers performed by the Western capitalist metropolitan countries to safeguard their interests and ruling positions as well as the interests of their agents (bridgeheads) in the periphery countries of the South;

7. the readiness of socialist states to transfer armaments to the countries of the Third World as a contribution to strengthening already performed social changes towards anti-capitalist and pro-socialist social orders - or as contribution supporting socio-political changes (such as liberation movements);
8. the obviously growing production of armament goods in a few sub-centers of the Third World itself, contributing, apart from other at present interesting phenomena (like new forms of international division of labour), to a political and military differentiation in the Third World and in this connection to the creation of regional powers which are to maintain order in the periphery countries;
9. equipping to an ever increasing extent everywhere, in the metropoles and in the peripheries, the military, paramilitary and police forces with weapons which might be used against their own population to enforce discipline: wherever structural violence patterns are in danger of breaking up, the use of direct violence and, therefore, of counter-insurgency is considered to be of foremost importance for the preservation of the status quo.

3. Characteristics of Armaments

After this brief survey of some spheres of armament activities in present-day international society, it remains important to indicate three general features characterizing armaments in all these connections:

1. Armaments are multifunctional entities. This multifunctional nature essentially results from a combination and cumulation of declared (i.e. military or dominance assuring) and denied functions (i.e. repressive-disciplinary, integrating socializing function etc.)[18]. What is declared to be the function of armaments in individual cases and which functions of the presently pursued armament policies are denied can only be examined in concrete individual cases[19]. Some of the repressive and disciplinary functions of military machineries would at present be clearly denied in most highly industrialized countries, while, for instance, in many societies of the Third World they are advertized openly as the actual function of the military (see the various theses on the modernizing effect of the army in the Third World[20]). Generally we might state that in spite of the most varied visible distribution patterns of these functions, the transitions from declared to denied functions are markedly blurred. And just this fact is the decisive point for our argumentation in this context. In all cases in which today armament activities of any kind whatsoever are observed we can also observe an interlacing and overlapping of concrete functional relations of armament activities and military machineries, whether they are admitted or denied. This fact transforms armaments into a much more unassailable object than is usually assumed (see Diagram 2).

If we divide heuristically armament functions into declared and denied as well as horizontal (orientated towards competitive inter-state conflict situations) and vertical ones (preserving dominance patterns), combined functional types will result which in reality do not exclude one another but co-exist, i.e. that

DIAGRAM2: The Causes and Interdependence of the Functions of Armament

(Hypothetical Assumptions)

	military:	political:	socio-economic
Functions of Armament Policy	inter alia: defense security deterrence offensive action	inter alia: maintenance and extension of influence, control coordination	inter alia: promotion of production and sales industrialization and technical innovation maximization of profits
which are dependent upon:	assessment of the strategic situation perception of the enemy actual perception of conflict and of threat	actual interests in power and expansion the chances for influence of single interested groups	over-all economic prerequisites for safeguarding stability, for regulating the economy lobbies
and their manifestation in:	size, organization and structure of the military apparatus position of the military apparatus in decision-making processes orientation of security policy (traditions of conflict, attitudes towards conflict)	organization of the political system and of the political process (the socio-economic system as a restrictive condition) ideologies (self-image and perceptions of the environment) behavioral norms and expectations (political culture)	economic system (process of allocating capital) socio-economic order (safeguarding the existing chances for control and spheres of interest)

they often mutually condition each other and especially mutually strengthen each other. They transform armaments into a social fact integrated in many ways into social structures, in spite of the propagation of "purely" military tasks (see Diagram 3).

Diagram 3: On the Co-existence of Multiple Functions of Armaments

	Functions: horizontal	Functions: vertical
declared	e.g. deterrance and defence between East and West	functions related to internal security in case of revolutionary movements
denied	redistribution process caused by armament expenditures with respect to resource allocations	socialization and disciplining effects

2. This multifunctional nature of armaments is also closely connected with the second observation made during the past years regarding the analysis of armament phenomena: its redundant causation[21]. This state of affairs has to be devoted special attention because phenomena created by redundant causation need not necessarily change substantively by particular interferences limiting individual dimensions of their reproduction dynamics; on the contrary, in redundantly caused social complexes we might much more often expect unlimited reproduction in spite of particular interferences. Elsewhere we were, for instance, able

to show that in spite of all the attempts to arms control made during the last 10 years, the international arms race has been developing especially in those dimensions which are to be reduced on the basis of international arms control agreements[22]. The politico-psychological détente, i.e. the decrease in the active enemy-image propaganda, obviously has so far not brought about a reduction in armament activities, especially between capitalist and socialist countries. The highly developed ability of armament complexes to a <u>self-sustained growth</u> and, if necessary, to perform vigorous <u>compensatory activities in cases of marginal arms control limitations</u> requires special analytical attention, especially if we try to draft concrete political considerations aiming at an <u>effective</u> arms control and disarmament.

3. Closely connected with multifunctionality and redundant causation is a phenomenon called <u>configurative causality of armaments</u>[23]. That also relates to a state of affairs in the armament sphere which in a different topical context was called <u>circular causality with cumulative effects</u>.[24] If specific causes lead to specific effects which in their turn again become factors causing new events, if synchronic as well as diachronic analyses can prove that multiple, in detail quite contradictory causal factors co-exist and that this fact means that the simple causality relations in the sense of definite one-dimensional relation patterns between independent intervening and dependent variables methodologically break down in front of this actual reality of armament complexes of a given scope and size, we are facing a reality

in front of which the normal scientific textbook-methodology and the thoughts on causality described in it have to be put ad acta because they tend to be analytically not applicable.

Multifunctionality, redundant causation and configurative causality are naturally very closely connected. The more multifunctional a social unit of the size of an armament complex is, the more probably will it be redundantly caused, and the easier will it be to observe configurative causality. In this way, the facts behind multifunctionality, redundant causation and configurative causality mutually strengthen each other, and for that reason we do not speak arbitrarily but in a very materially motivated way of armament dynamics as the analytically adequate concept on the reproduction and growth of armament activities that may be observed at present. Apart from that, such a concept also finds its material motivation in the fact that armament complexes of contemporary size and scope are in highly industrialized countries (within the framework of the West-East conflict formation) only in the final instance determined by this antagonistic conflict formation, the direction and intensity of their further growth, however, are relatively contingent with respect to the antagonistic incompatibility of political interests within that conflict formation; and, therefore, this entity shows traces of autodynamic growth patterns. We cannot report on the degree of such a contingency or autodynamics in the context of this paper; it was studied elsewhere[25].

4. Conclusions Drawn from the Above Considerations

We would like to formulate in this place three general practical conclusions:

1. With a view to the given dimensions of armament dynamics, disarmament can today only be adequately understood as the reduction of the multiple functions of armaments. That means that every disarmament concept concentrating only on the manifest military and in addition purely inter-state functions of armament, necessarily can neither suit theoretically nor practically the purpose. Talking about the reduction of multiple functions, such a demand has to be related to the declared and the denied, the horizontal and the vertical functions of armaments. Translated into practical strategies of action that means that a disarmament strategy must mean both the mastering of inter-state and inter-social antagonistic and/or conflicting incompatibilities of interest and the reduction of dominance patterns between societies and within individual societies in as much as these are the causes for exploitation and social injustices and thereby for a military and police machinery to secure the existing status quo. If the functions of armaments were clearly separated, i.e. if in reality especially horizontal and vertical functions could be divided from each other, a disarmament program would at least be thinkable which would refer separately to the one or the other dimension. As the functions of armaments, however, are interlocked in an almost symbiotic way, it is, of course, possible to act on the one or the other dimension with special emphasis on practical programs; of lasting success, however, can a disarmament policy only be, if both, the horizontal and the vertical, dimensions are coped with in an emancipatory mode.

2. This is connected with the fact that a disarmament concept with an orientation towards destructive hardware alone, i.e. police and army equipment, will not succeed. Of central importance is the fact that a disarmament strategy concentrating on the destructive potential alone will only succeed if at the same time the outdated political, military and socio-economic context from which armament activities emerge is changed in its very structure[26]. That means factually that a disarmament concept adapted to present realities must not only combine the so-called direct and round-about strategies ((i.e. strategies concerning the armament potentials themselves and those that are directed towards a change of the context in which they emerge)); it must, beyond that, (just because it has to stabilize with the aid of round-about strategies the positive results of a disarmament of hardware achieved on the direct path)) be synchronized with other emancipatory political aims and movements. A disarmament strategy in the sense of a single-purpose strategy could, under the given circumstances, actually be supported reasonably only if the aim was the destruction of overkill capabilities.

The decisive question for every disarmament concept and disarmament practice would then be: what spin-off effect a disarmament strategy in the narrower sense (eliminating only hardware) actually has, and what reactions a disarmament strategy in the wider sense ((eradication of the context producing armaments) has with respect to the reduction of the destruction potentials. In other words, what changes have to take place in the narrower sphere of armament activities to enable the respective spin-off

effects of the larger social context to contribute to the success of larger emancipation movement within society? And which changes in a larger context would be apt to have accelerating positive repercussions on cutting down armament activities?

3. Each answer to this question which in many respects now still has to remain hypothetical will necessarily meet with a practical dilemma. Arms control and disarmament policy strategies today are socio-politically neutralized instruments of policy, and, therefore, deliberately planned in an incrementalistic way. That means that the objects to which they are directed are deliberately isolated from larger issues for principal-political and negotiational-tactical reasons, and in this isolated state they are then discussed in negotiations lasting a very long time. In the strict sense of the word this is a technocratic manner to deal with arms control and disarmament problems in practical politics and necessarily leads to separating such a practice from all forms of more broadly defined socio-political conflicts on armaments and disarmament[27]. In this limitation lies necessarily the core of the continuous failure of effective arms control and disarmament steps in view of the autonomous further development of armament machineries and the already now visible decisive and determinant characteristics of armament dynamics.

The three above mentioned prospective conclusions drawn from the earlier considerations lead to further practical problems which are to be discussed in the next chapter.

5. Coupling and Decoupling Problem Areas

An important aspect of such practical considerations on an effective arms control and disarmament strategy lies in the question: to what extent are the partial aims of particular disarmament steps to be linked to a comprehensive strategy, or to what extent are such partial disarmament aims and their translation into factual politics to remain consciously separated.

In principal it could be argued that the practical experiences made so far with arms control and disarmament policies are in favour of linking or coupling them, because actual restrictive measures in one field always led to compensating activities in others; this has to be stated as the empirical sum total of the arms control measures implemented so far.[28] If within the framework of a comprehensive disarmament strategy an attempt was made to interlock or couple certain partial disarmament aims, under optimum conditions such compensatory activities by the existing military machineries would be deprived of their basis. Apart from that it would be guaranteed that after overcoming a certain practical resistance, which has to be expected at the beginning against an effective arms control and disarmament policy, with the aid of an overall strategy synchronizing such separated aims a certain take-off could be made towards further disarmament measures. In this way a sort of chain-reaction could be introduced easier than if every partial aim of a disarmament strategy would have to be followed up separately with a new start.

Extensive disarmament strategies with the aim of interlocking partial aims would have to be conceived simultaneously in at least three spheres:

1. the socio-political sphere guaranteeing at least that an arms control and disarmament strategy would not remain outside far-reaching emancipatory socio-political aims, i.e. isolated as a technocratic strategy;

2. within the sphere of the military machinery itself. Here it would be important to prevent the ever menacing substitution of labour-intensive investments by highly capital-intensive investments. It would mainly have to be prevented that quantitative restrictions be over-compensated by qualitative innovations;

3. in the geographic-regional sphere regarding the different, earlier listed places of armament activities. Attention would, for instance, have to be paid to prevent the armament restrictions in the conventional range in Central Europe being compensated by an intensification of armament business and arms transfers between the metropolitan countries of the North and the peripheral ones of the South.

The following systematic illustrations are to explain further the above described considerations:

1) It has to be prevented that compensatory and substituting activities take place between the nuclear-strategic, the tactical-nuclear, the conventional, the counter-insurgency, the armament business and arms transfer levels. A reduction in conventional armament here in Central Europe (e.g. in the number of men) without

simultaneous pledge referring to concrete armament restrictions in the tactical-nuclear branch of the same region contributes only very little to reducing the destruction potential in Central Europe altogether, as there exists the danger that men will be replaced by better equipment. Just as little would it serve disarmament if there was a change from armament activities for one's own use to an enlarged armament business and to more extended arms transfers between the metropolitan and the peripheral countries. Keeping all the levels and arenas of armament activities discussed and mentioned in this paper in mind in the course of arms control and disarmament negotiations, - i.e. if the negotiations on partial questions take place with a knowledge and consideration of the broader context -, then at least at the beginning there would be a stop to the quasi-instinctive search for compensatory activities imminent in the military machineries in case of restrictive interferences.

2) Of special importance should,in this connection, be an attempt to come to an agreement not only on the restriction in the number of men but also in the investments spent on military machineries. Should a real limitation in the number of military personnel come true, it would not really help much without an actual restriction in military research and development as well as military procurements, as the argument is quite valid that a military machinery with a reduced number of personnel but higher capital-intensity has a greater destructive power than an outdated labour-intensive one. An arms control and disarmament agreement relating only to the number of men could then easily become a lever for an accelerated rationalization of the existing military institutions which are presently handicapped by many organizational problems.[29]

3) It is also important to prevent that arms control and disarmament agreements in certain partial fields are depreciated by a change in the political framework in which the remaining military machineries will operate. There is, for instance, a quite realistic danger that following an agreement on arms control in the Central European region, the two military alliances would rather be tempted to intensify military integration in their own camp instead of starting on new, so far to a certain extent unknown paths of all-European security systems[30]. The effects of such politically motivated processes are showing up during the last few months in a different context, i.e. the attempted rearrangement between the U.S. and their European NATO partners. As a reaction to the announced partially military dissociation of the U.S. from Europe, the demand that the role and function of the so-called Euro-group be increased, that an independent nuclear-strategic component be accepted in the West-European defence policy (within the framework of the European Community) and that a joint cooperation in the field of military technology and weapons production be pursued, was voiced more and more frequently in the West-European area. The opportunity that such a beginning military disengagement of the U.S. from Europe could open up for alternative forms of an <u>all-European</u> security policy, does not even enter conscious political thinking because these compensatory demands are again presented in a sort of instinctive manner by the security machineries.

4) Last but not least it would have to be prevented that arms control measures in inter-state and inter-society areas will be compensated by an expansion of the police and para-military organizations within the societies (substitution of horizontal activities by vertical ones). This point should be especially emphasized in this connection because an effective arms control and disarmament policy conceived as an emancipatory social policy necessarily has to lead to internal social conflicts unknown as long as traditional security policies are pursued since these traditional policies had a particular disciplining impact on public opinion.

Apart from the reasons already given here in support of a so-called coupling strategy, we naturally also have to discuss those reasons speaking against such a strategy.

Especially we have to take the following into account:

1. If an attempt is made to overcome a so far technocratically performed arms control and disarmament policy by a comprehensive emancipatory socio-political strategy, it may be forecast that the intensity of the resistance against arms control and disarmament will grow relatively quickly. This entails the danger that the armaments which for years, perhaps even decades, could develop without fundamental criticism and without particular problems, will continue to grow unchecked.

2. Comprehensively conceived socio-politcal strategies rarely have positive effects outside successful revolutionary movements. Usually political deliberation and decision-making processes proceed step by step and so slowly and incrementally that any attempt of linking several levels

and issues of disarmament aims and disarmament steps will cause an overburdening of the respective organizations responsible for drafting such a political strategy.

3. The interlacing of politico-geographical and regional spheres (as, for instance, arms control in Central Europe and arms control in a certain region of the Third World) could lead to a multiplication of the existing problems, not only because the connection of such politically and regionally distant areas means a complication of the problems facing us, but also because each region has its specific special problems which practically and politically can only be solved in its own context (i.e. the Berlin problem in Central Europe as against the Palestine problem in the Middle East).

There is no magic formula that could indicate the paths between the reasons for and against a comprehensive coupling strategy for arms control and disarmament policies. Nevertheless, a plausible directive should say that we should try to achieve links which on the one hand would exclude compensatory activities of the military and on the other hand would add enough dynamics to arms control and disarmament strategies from general socio-political movements so that this further input will not be counter-productive but rather lead towards a growth-supporting impact on real arms control and disarmament steps. It is difficult to draft general directives not relating to concrete issues such as the MBFR problems or others.[31] Decisive for the

evaluation of these practical problems are efficiency criteria within concrete contexts, and not abstract postulates. Therefore, a reflexion on such practical problems always consists of a combination of strategic and actual tactical considerations.

6. Unilateral Measures and Gradualistic Prospects

Part and parcel of the premises and practice of the international arms control and disarmament policy of the last ten years is a bi- and/or multilateralism indisputably accepted in East and West, in neutral states and by the representatives of the Third World which excludes unilateral steps in arms control and disarmament in concept and in practice right from the start as senseless and counter-productive.This phenomenon is closely connected with the fact that today arms control and disarmament diplomacy form part of the arcanum sphere of the nation-state and are not the result of intra-societal conflicts. All the more has peace research the task of critically examining this usual practice, as the failure of the efforts made so far to reach concrete arms control and disarmament measures could with some probability be integrated in its premises.

It is not difficult to prove (and an attempt to show it was made elsewhere) that the arms control and disarmament diplomacy developed up to date was massively overrun by the armament machineries of East and West, no matter what the concrete results of arms control agreements concluded individually during the last ten years might have been.[32] On the basis of the knowledge of the presently decisive determinants of armament dynamics as well as

the knowledge of the hardly successful arms control and disarmament negotiations of the last ten years, we could hypothetically argue that also in the near future this combination of mightily advanced military technology (and its actual social and political implications) on the one hand and the powerless arms control and disarmament policies on the other will continue to determine the real political development - unless the premises of this policy themselves are changed.

The escalatory impulses for further military-technological research and for military development programs as well as for the actual acquisition of new weapon systems can only be thwarted and broken up if the arms control and disarmament diplomacy can be built on a fairly extensive realm of manoeuvre <u>within</u> societies making for a larger flexibility for serious diplomatic activities with respect to <u>effective</u> arms control and disarmament measures. Such a potential realm of manoeuvre is systematically obstructed in the present practice because the usual premises for international arms control and disarmament negotiations still state that we might only from a position of power policy expect concessions from the potential adversary. As long as this premise is accepted by all participants as the fundamental rationale of negotiations - no matter whether it is expressed explicitly or implicitly - an escalation of armament activities does not only take place before the negotiations but also during them. This makes the potential results of such a diplomacy already outdated at the very moment at which the participants of such negotiations might just have arrived at some results, because the actual arms developments simply surpass such possible results[33].

An alternative action perspective would consist in getting out deliberately of the - as we might call it - desired vicious circle by the combination of two political activities: on the one hand by a consciously planned attempt to change the inter-state and inter-society contexts from which the armament activities resulted in the past[34]. In this connection the theoretical and empirical results of peace research on the conditionally peace promoting influences of deeper forms of co-operation between differing social orders and states become relevant. Here we quite consciously used the formulation "conditionally peace promoting", because a deepening of interactions between societies and states, just as on other levels of human existence, does not automatically lead to a better mutual understanding, to balancing antagonistic and/or competitive interest positions; a positive result of such deeper interactions can only be attained if they have specific qualitative features (such as symmetry, promotion of social justice etc.).

On the other hand it would be necessary to create some genuine flexibility for international diplomacy in the respective national and societal framework by forms of unilaterally induced self-limitations and self-control of one's own or allied armament activities which would offer this diplomacy a real chance for effective arms control and disarmament measures, liberating it of the Don Quichote-like tasks it had to perform up to this date.

The combination of these two action premises: change in the inter-state and inter-society context which so far produced rather further armament activities than arms control and disarmament measures on the one hand, and the readiness for self-limitation

and self-control in the respective national sphere and within the existing military alliances documented by unilateral measures could, on the other hand, if quite pragmatically pursued, create the prerequisites for a better prospect of effective short and long term arms control and disarmament steps. While at present we can observe, for various reasons, a change of the outdated political context into the direction of a normalization of the relations between the two great powers and in Central Europe, there is a danger that such a change may - at least at the moment - contribute still more to a consolidation of the outdated security policy than its critical reappraisal. The military machineries and armaments complexes seem less problematic today than they really are. This combination of a policy of détente and co-operation on the one side and a security and armament policy carried out according to the old premises on the other side, does not only fail to increase the chances of effective arms control and disarmament measures here and now, but also in the long run endangers the processes of normalization of relations between East and West[36]. Peace in Europe cannot be assured for a long time on the basis of a peaceful co-existence of détente and an ongoing arms race.

In this peaceful co-existence of détente and arms race it becomes quite evident how considerable the socio-political deficits of international policy at present in the capitalist as well as in the socialist metropolitan countries are. It is quite possible that today it is only conceivable to arrive at arrangements between East and West on the basis of such deficits, as only a technocratic arms control and disarmament diplomacy isolated from more comprehensive socio-political aims leads to those common results of a symbolic or cosmetic arms control policy which is not really detrimental to the further growth of armament machineries and does not really provoke in the public any critical questions on the legitimacy of the traditional security policy.

If that was so, it would become obvious that arms control and disarmament policy such as they have been performed during the last years and probably will continue to be pursued in the period to come, represent only a part of the armament dynamics, in its comprehensive definition as stated in the chapter above.

7. Conclusions

Even if that would be so, we could not be sure that such an arms control and disarmament policy which would be isolated from socio-political issues, could be pursued for a long period. The real conflict potentials in international society are too great and the growing problems in the nations themselves are too virulent in the industrial countries as well as in the Third World to keep from mankind's consciousness the basic alternatives of an armament-bound waste of resources at the level of overkill capabilities and the social use of alternative socio-political activities for the satisfaction of elementary needs of individuals and entire societies.

The social costs of armaments and their concrete functions (such as the stabilization of irrational dominance patterns) cannot be reduced to financial and budgetary items alone. Armament activities are at present so embracing that not only military machineries direct their whole attention to the systematic well-devised as well as planned further development of their existence. An effective armament policy implies today the synchronization of political leadership, military machinery, armament industry and technological know-how. That means that not only the attention of the state organization but also especially the imagination of science is diverted, as never before, in a systematic way to the further development of the devastation potentials.

The discrepancy between the perfection of the destructive potential and the lack of satisfying the elementary needs of millions of people in some parts of industrial society as well as especially in the Third World does not decrease; on the contrary, it increases constantly. This discrepancy may only be preserved, as is seriously considered in many places, by military means, i.e. by counter-insurgency.

The evaluation of structural violence patterns would be fatally mistaken if it was presumed that also in future such structures could be curbed by military means. Such a forecast, however, is something a bureaucratic policy easily accepts; it is frightfully ignorant of the world and social reality and carries the germ of self-destruction in itself[37]. As such a destruction would not mean the beginning of a new, happier and safer era of humanity but the terrible end of many achievements attained in the heavy struggle waged by man all through his history, armament and disarmament problems must - in face of the massive piling up of further violence potentials - become much more than ever in the past the most important object of scientific work and political discussions. Today that is certainly not the case.

NOTES

1 See paradigmatically the literature collected by me on disarmament problems in the bilbliography edited by Gerta Scharffenorth and Wolfgang Huber (ed.): Neue Bibliographie zur Friedensforschung, Stuttgart and Munich 1973, Chapter VI, 4. As an exception compare Gerhard Brandt: "RÜstung und AbrÜstung", in E. Krippendorff (ed.): Probleme internationaler Beziehungen, Frankfurt 1973, pp. 137-158. In that article the historical dimensions of the problems treated in this paper are also developed. Compare also Johan Galtung: "Two Approaches to Disarmament. The Legalist and the Structuralist", in Journal of Peace Research No. 2, 1967, pp. 161-195.

2 See Dieter Senghaas: RÜstung und Militarismus, Frankfurt 1972, Chapter I.

3 Dieter Senghaas: Aufrüstung durch Rüstungskontrolle. Ueber den symbolischen Gebrauch von Politik, Stuttgart 1972, Chapter I.

4 Dieter Senghaas: "Konfliktformationen in der gegenwärtigen internationalen Gesellschaft", in Wilfried von Bredow (ed.): Zum Charakter internationaler Konflikte. Studien aus West- und Osteuropa, Köln 1973, pp. 10-55 (in English published in the Journal of Peace Research, No. 3, 1973).

5 See George W. F. Hallgarten: Das Wettrüsten, Frankfurt 1967.

6 See Ulrich Albrecht: Politik und Waffengeschäfte, Munich 1972.

7 See Ulrich Albrecht: "Die Struktur von RÜstungsausgaben", in Leviathan. Zeitschrift für Sozialwissenschaft, Vol. 1, 1973, No. 1, pp. 43-70 (in English published in the Journal or Peace Research, No. 3, 1973).

8 See Mary Kaldor: "European Defense Industries. National and International Implications", Institute for the Study of International Organizations, University of Sussex, Monograph, No. 8, 1972 as well as Ulrich Albrecht: "Collaborative Production of Armaments: Towards a Transnational MIC in West Europe?" in German in Leviathan, No. 1, 1974 .

9 See Dieter Senghaas: Abschreckung und Frieden. Studien zur Kritik organisierter Friedlosigkeit, Frankfurt 1972 (2nd ed.).

10 On armament transfer form the metropolitan countries to the peripheral ones as well as armament activities in the peripheral countries, see the so far unpublished manuscripts by Ulrich Albrecht, Peter Lock and Dieter Ernst elaborated within the "Rüstungstransfer-Projekt" of the VDW, Hamburg 1972-74. See their report in Bulletin of Peace Proposals, Vol. 1974, No. 2.

11 I have explained in various places that this is not an arms race in the strict sense of reciprocal escalation. See Dieter Senghaas: Rüstung und Militarismus, op.cit., note No. 2, chapter 2 and my treatise "Rüstungsdynamik als restriktive Bedingungen in Versuchen einer Überwindung des Ost-West-Konfliktes", in Dieter Senghaas: Gewalt - Konflikt - Frieden. Essays zur Friedensforschung, Hamburg 1974, pp. 37-54.

12 How questionable this maxim is, was demonstrated lately in Carola Bielfeldt, Gert Krell and Stephan Tiedtke: "Aufrüstung durch Rüstungsvergleiche. Europäische Sicherheit: Ein Rechenkunststück?", in Frieden in Europa? Zur Koexistenz von Rüstung und Entspannung, Reinbek bei Hamburg 1973, pp. 8-47.

13 See my treatise "Konfliktformationen in der gegenwärtigen internationalen Gesellschaft", op.cit., note 4, pp. 40-43.

14 See Dieter Senghaas (ed.): Peripherer Kapitalismus. Analysen über Abhängigkeit und Unterentwicklung, Frankfurt 1974.

15 See Dieter Senghaas: "Friedensforschung und Dritte Welt", in Gewalt - Konflikt - Frieden, op.cit., note 11, pp. 84-110.

16 On the dialectics of direct and structural violence see Johan Galtung: "A Structural Theory of Imperialism", in Journal of Peace Research, Vol. 8, 1971, pp. 81-118, as well as the basic article by the same author "Violence, Peace and Peace Research", in Journal of Peace Research, Vol. 6, 1969, pp. 167-191.

17 See as a case study Dieter Senghaas: Rüstung und Militarismus, op.cit., note 2, chapter III.

18 On the multifunctional character of armament see Carola Bielfeldt and Dieter Senghaas: "Kann die BRD abrüsten?", in Leviathan, Vol. 1, 1973, No. 3, pp. 290-309, especially p. 306. An early analytical formulation can be found in Gerhard Brandt: "Divergierende Funktionen militärischer Rüstung", in E. Krippendroff (ed.): Friedensforschung, Köln 1968, pp. 260-274.

19 Dito, for the example of the FR of Germany.

20 Referring to a critical appraisal see Bassam Tibi: Militär und Sozialismus in der Dritten Welt, Frankfurt 1973, chapter I.

21 See for this and the next notes Dieter Senghaas: Aufrüstung durch Rüstungskontrolle, op.cit., note 3, p. 81.

22 Dito

23 Dito

24 As stated by Gunnar Myrdal on the causes of underdevelopment.

25 See the article quoted in note 11. See also Johan Galtung and Dieter Senghaas (ed.): Kann Europa abrüsten? Friedenspolitische Optionen für die 70er Jahre, Munich 1973, especially p. 9 and p. 92 as well as Raimo Väyrynen: "Two Approaches to European Security: Cooperation and Arms Control (unpublished ms.).

26 See on this question the inspiring study by Walter Möller and Fritz Vilmar: Sozialistische Friedenspolitik für Europa. Kein Frieden ohne Gesellschaftsreform in West und Ost, Reinbek bei Hamburg 1972, as well as Fritz Vilmar: Rüstung und Abrüstung im Spätkapitalismus, Reinbek bei Hamburg 1973 (6th ed.).

27 The analysis of the technocratic dilemma of deterrence policy and traditional arms control policy in Dieter Senghaas: Abschreckung und Frieden, op.cit., note 9, p. 224.

28 See Dieter Senghaas, Volker Rittberger und Burkhard Luber: "MBFR: Aufrüstung durch Rüstungskontrolle?", in Frieden in Europa?, op.cit., note 12, especially p. 59.

29 Dito, p. 77.

30 See the forecast by Johan Galtung on the further development of the EEC in Johan Galtung: The European Community. A Superpower in the Making, Oslo 1972.

31 In the contribution quoted in note 28 this was expressed in a very initial sense.

32 See the contribution quoted in note 28 and Dieter Senghaas: Aufrüstung durch Rüstungskontrolle, op.cit., note 3, passim.

33 This thesis can be verified very widely by the example of the SALT I agreement. See the book quoted in note 3.

34 See Johan Glatung and Dieter Senghaas (ed.): Kann Europa abrüsten?, op.cit., note 25, especially p. 9 and p. 92.

35 Ernst-Otto Czempiel's arguments take a similar direction in Schwerpunkte und Ziele der Friedensforschung, Munich and Mainz 1972, p. 81, and now again Charles Osgood: "GRIT for MBFR in Europe. A Proposal for Unfreezing Force Level Postures in Europe" (unpublished ms.).

36 See Renée Arons and Egbert Jahn: "Vom Kalten Krieg zur Entspannung", in Frieden in Europa?, op.cit., note 12, especially p. 121.

37 Dieter Senghaas: Aggressivität und kollektive Gewalt, Stuttgart 1972 (2nd edition), p. 58.

ERRATA - 1 (August 29, 1975)

XXV-16 J. Nishikawa

1. p.7, on 12th line:

"inflation" should read "proliferation".

2. p.7, on 21st line:

"IAEA" should read "IEA".

Opening Address

August 28, 1975

Hideki Yukawa

I have been ill and in the hospital since May of this year. I have undergone operations twice in June and July. I am still too weak to participate in the discussions of the sessions of the Symposium, because of the aftereffects of the disease and operations. However, I came here since I think it my duty to say a few words of greeting to welcome our friends from abroad, on behalf of Japenese Pugwash group. The present Symposium is rather small in scale with a limited number of participants, but I believe that we may be able to make it very significant. In order to do so, we must first reflect on the spirit of the Russell-Einstein Manifesto of 20 years ago. It was novel because it was called for an international conference to be held by scientists for the survival of mankind. It was novel in denouncing all wars and aiming at the abolition of nuclear weapons, because there was always the possibility for any war to develop into nuclear war which may lead to the destruction of mankind.

In response to the Manifesto, many Pugwash conferences and symposia have been held since 1957. Nevertheless, we find ourselves not in a position to praise our success, but we have rather to grieve over our lack of achievement. This is because we have failed to stop the nuclear arms race. In particular, the two major nuclear powers have been constantly increasing

their nuclear armament both in quality and quantity during the past 20 years. This trend of vertical proliferation continues to this day.

On the other hand, we have to worry about the horizontal proliferation of nuclear weapons to more and more countries. It is true that the Non-proliferation Treaty was signed by many countries and is being ratified by an increasing number of countries. Behind the signing or ratification by many of the non-nuclear-weapon states in spite of the unfairness and disadvantage of the treaty to them, there is the hope and expectation that by so doing they can influence the nuclear weapon states to live up to their obligations regarding nuclear disarmament.

One of the most important factors hampering the way to nuclear disarmament has been the concept of nuclear deterrence. There have been diverse arguments about it, but it is clear that the policy based on the concept of nuclear deterrence suffers constantly from the positive feedback, which means the nuclear armament of the superpowers is directed toward infinity. This is just the opposite of the way to nuclear disarmament, which is in principle directed toward zero. The measures to achieve nuclear disarmament must be exclusively a process of repeated negative feedback.

Another very important problem is the security of non-nuclear-weapon states. The first thing and the very minimum that we can expect at this moment is a pledge by all nuclear weapon states that they will never use or threaten to use nuclear weapons against non-nuclear-weapon states. Such a pledge may also be useful to prevent the horizontal proliferation of nuclear

weapons. I shall not go further into all such problems, since they are going to be discussed in detail during the sessions of the Symposium.

Among the other main themes of the Symposium are the ethics and the social functions of scientists and engineers. But I leave these to the discussions of the forthcoming sessions. Instead, I would like to conclude my talk by expressing my personal vision about the future of mankind. Although it is necessary for the survival of mankind to achieve nuclear disarmament, it is also clear that nuclear disarmament is only a part of what we must achieve. It is a vital part of general and complete disarmament. Even the latter is not the whole of our aim. The final goal is to establish a world system in which the security of all countries is guaranteed without the need for their own armament. In this respect, I share with Russell and Einstein the idea of world federation.

However, irrespective of whether we have such a vision in mind or not, I think we all agree on the necessity of achieving nuclear disarmament. I believe that we all agree that nuclear weapons are our common enemy and the complete abolition of all of them from the earth is the goal at which we are aiming. I sincerely hope that the concrete proposals in the forthcoming sessions will make an effective contribution to achieve nuclear disarmament.

25th Pugwash Symposium
A New Design towards Complete Nuclear Disarmament
(the Social Function of Scientists and Engineers)
Kyoto, JAPAN, 28 August - 1 September 1975

H. Yukawa (Japan)

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THOUGHTS ON NUCLEAR DISARMAMENT
- RESTRUCTURING THE PUGWASH MOVEMENT -

The 25th Pugwash Symposium is opening. Though it is small in scale with a limited number of participants, we may be able to make this conference very significant. In order to achieve this we must first reflect on the fundamental spirit of the Russell-Einstein Manifesto of 20 years ago. It was novel first because it called for an international conference to be held by scientists "for the survival of mankind". Scientists had issued appeals before that time, but these were for a part of, rather than for all of, mankind. The second point, which is inseparably related to this difference between the previous appeals and the Manifesto, is that while the former were against certain wars from certain points of view, the latter denounced and aimed at the abolition of all wars because there was the possibility for any war to develop into nuclear war, and thus lead to the destruction of mankind. The problem here is that the advent of nuclear weapons is forcing us to reconsider our basic outlook on the future of mankind. Of course if we go into detailed discussions on the definition of a war, there can be various opinions concerning it; likewise, there can be objections to

*Toshiyuki Toyoda is responsible for this English version, because the author could not check it due to his illness.

the details of the expressions of the Russell-Einstein Manifesto. However, there could be no objections to the abolition of warfare as a basic goal and to the necessity of abolishing nuclear weapons, which can lead mankind into destruction.

In response to the Manifesto, the Pugwash conferences and symposia have been held many times since 1957. The fact that, as years pass, the number of participants to the conference is increasing would have pleased us in another time, but we find ourselves in no position to praise ourselves when we look back on the 20 years of the Pugwash Movement. We are, rather, inclined to grieve over our lack of efficacy. This is because we have not only failed to stop nuclear arms races but the two major nuclear powers — the United States and the Soviet Union — have been continually reinforcing their nuclear armament both in quality and quantity for the past 20 years.

In the meantime, the resolution for general and complete disarmament, which was proposed by all the UN member nations (82 nations), was adopted by unanimous support in the 14th General Assembly of the United Nations in 1959. In 1961, the United States and the Soviet Union took the initiative, following the line set by this resolution, by announcing the Joint Statement of Agreed Principles for Disarmament Negotiations whereby they requested the cooperation of other nations regarding multilateral disarmament. Similarly, the main

topic at the Pugwash Conference was the question of disarmament, almost every year around this time. In every case the ultimate goal was general and complete disarmament, and it was clear to everyone that the first step to be taken for its achievement had to be nuclear disarmament. However, in reality, nuclear armament has been reinforced both in quality and quantity instead of being reduced, and this trend continues to this day.

We welcomed the conclusion of the Partial Test-Ban Treaty in 1963 as the first step toward nuclear disarmament. However, contrary to our expectation, underground nuclear weapon tests have been continued, thereby serving to reinforce the power of nuclear weapons. The Treaty on the Non-Proliferation of Nuclear Weapons, which was signed by many countries in 1970, is being ratified by an increasing number of countries. Though we are fully aware that it is inevitably an unfair treaty, we, Dr. Tomonaga and I, especially, have been repeatedly urging the Japanese Government to an early ratification since it is meaningful for the prevention of so-called "horizontal proliferation" of nuclear weapons. Among the various arguments raised concerning the ratification of this non-proliferation treaty in Japan, one of the strongest arguments against the ratification is that the security of a non-nuclear weapon state like Japan is not ensured. Another is that not enough effort has been made by the nuclear weapon states, particularly the United States

and the Soviet Union, for nuclear disarmament. These will be the major topics of discussion at this symposium. Anyhow,

so-called "vertical proliferation" is undoubtedly more important than horizontal proliferation. Behind the signing or ratification by many of the non-nuclear weapon states of this unfair and disadvantageous treaty, is the judgement that by so doing they can lay a great obligation on the nuclear weapon states regarding nuclear disarmament.

The situation where nuclear armament continues to be reinforced while the necessity for nuclear disarmament is recognized as a guideline, shows that there are fundamental mistakes in our approach. One of the most typical mistakes is the concept of nuclear deterrence. The concept is that no nuclear war will occur if the nuclear armament of the two superpowers, the United States and the Soviet Union, are kept in an equilibrium in the sense that nuclear state A's initial nuclear attack on nuclear state B can be countered by B's second strike, which can give A the same degree of damage as B has received from A, and vice versa. The idea is that this kind of equilibrium of nuclear armament will deter either state from attacking the other. It seems at first conceivable that if both states take this view their nuclear armament will arrive at a static state at some point. Even if such a state should appear to have been achieved for a certain period, such a state would be extremely unstable. The two states that do not know each other com-

pletely and that cannot predict each other's future state with 100 percent certainty, will each try to advance its own armament above the level expected to be achieved by the other state. Therefore, both will constantly receive a positive feedback, which means that the nuclear armament of both states is directed toward infinity. This is the complete opposite of nuclear disarmament, which is in principle directed toward zero. Therefore, if one admits nuclear disarmament is necessary, one should first of all abandon the concept of nuclear deterrence. The measures to achieve nuclear disarmament must be nothing else but a process of repeated negative feedback.

Furthermore, the pursuit of equilibrium involving positive feedback on the part of the nuclear superpowers will justify the retention or the reinforcement of nuclear armament on the part of other states. While the nuclear superpowers insist that they are compelled to reinforce their own security, what justification do they have for stopping the lesser nuclear weapon states or non-nuclear weapon states from insisting for greater rights on the reinforcement of their own nuclear armament ?

A fallacy that prevails today is related to the point mentioned above. It is the concept of "security under the nuclear umbrella", which is the idea that the security of a non-nuclear weapon state is ensured by its being under the nuclear umbrella of a certain nuclear superpower. This

concept is basically wrong, since the real security of non-nuclear weapon states can never be attained under the policy of nuclear deterrence, which will never serve to retain a stable equilibrium of nuclear armament, free from positive feedback. The only thing that we can expect here is the pledge of the nuclear weapon states that they will never make a nuclear attack on non-nuclear weapon states. It may be also useful to prevent the horizontal proliferation of nuclear weapons. I shall not go further into this question since it will be discussed at the Symposium.

Not only statesmen of many countries, but also quite a few of the scientists participating even in Pugwash, have not freed themselves from the concept of nuclear deterrence or that of the nuclear umbrella, despite the essentially self-contradictory properties that these undoubtedly contain. This seems, essentially, to be due to their basic viewpoint regarding nuclear weapons, which is to regard the nuclear weapon relatively as one of the many necessary evils in human society. In the long history of mankind, weapons or the development of weapons have been closely related to technological development. There have been among scientists and technologists quite a few who have held the view that weapons, as well as being by-products of technology, have served for the development of the latter, and thus that they have been indirectly serving the achievement of greater social welfare. Such a view has been reinforced by the tra-

ditional attitude that some wars can be justified as wars for the sake of justice. The advent of nuclear weapons has, at a stroke, made this kind of view out of date. Such partial and relative value judgements as are involved in deciding which wars/the interests of the state and which are are in

wars for justice have been surpassed by the necessity of recognizing nuclear weapons as the absolute evil, since are the potential destroyers of the entire human race. The Russell-Einstein Manifesto was issued on the basis of this very recognition that nuclear weapons are an absolute evil and that nuclear wars should never be brought about. At the early Pugwash conferences, this recognition seemed to be shared by the majority of the attendants. However, the situation has changed with time. As technical discussions from so-called realistic points of view have become more and more detailed on the one hand, less and less value has been attached to the basic recognition, conscious or unconscious, concerning nuclear weapons and wars.

In this connection, there has been considerable influence from the traditional attitudes toward science and technology in general. Especially in the field of pure sciences, it has been considered desirable for their development not to involve any judgement other than that between truth and falsehood. Similarly, in the field of applied sciences, scientists and technologists have been solely concerned with whether achieving a certain matter for a certain purpose is

technologically possible or not; it has come to be generally viewed that scientists and technologists need not judge the value of the purpose itself. In short, in the development of modern sciences, the general tendency has been to try to separate science and morality as much as possible, but of course scientists and technologists have not always been able to ignore morality. Especially in the case of medicine they have been following some kind of moral code or other ever since the time of Hippocrates. However, the wider the gap that separates a science from the studies directly related to human life such as medicine has been, the more distant has been the relationship between that science and morality. For example it has been usually considered that in the pure physical sciences a true-or-false judgement is ultimately the only criterion since the objects of physical studies are inanimate, and that also in applied fields the researchers need not evaluate the purpose of research themselves.

We physicists know from our experience that the above attitude has been fundamentally attacked by the advent of nuclear weapons. Since then scientists in other fields have learned from many actual examples that even when their researches do not deal with human beings they should not put aside the judgement between right and wrong with respect to the purposes of their researches, or that even when the purpose is justified, they should not neglect the consid-

eration of harmful by-products and the danger that might arise with the undertaking. It is especially the case with biology. It is now known that human beings and other living things share many common properties, both physically and functionally on a molecular level. Therefore, as is the case with medicine, biologists can no longer ignore the moral questions involved, even when they immediately deal with non-human life. Particularly in the field of genetic engineering, the problems raised by the researchers themselves are still more serious than in the case of atomic physics, with respect to the methods employed. Although the study is called "engineering", it cannot be separated from the main-stream of biology that seeks detailed knowledge about the fundamental mechanism of heredity, common to human beings and other life

It is natural, therefore, that an agreement has not been easily reached among the researchers regarding the extent to which a restriction should be imposed on such studies. It is a question that is most directly related to the essence of modern science. It is also difficult to evaluate the purposes of many studies in applied biology. In chemistry and mathematics, there are many problems that await a priori judgement on the relative weight between the positive value attached to goals and the negative effects that accompany their achievement. To take an example from mathematics, one of the problems is the way computors are to be used. No one can deny that

at the present stage of scientific development, unlike the 19th or early 20th centuries, the instances where we once again need to consider moral questions have suddenly increased. It means that the age of academia in the old sense of the word is over. For some problems, it is hard to get a consensus. In the case of the question of nuclear weapons, which presented itself comparatively early and in a dramatic way, the judgement from a moral point of view is easiest. No sane scientists will dare to protest openly to the judgement that nuclear weapons are an absolute evil.

The Pugwash Conferences, as you all know, were started for the definite purpose of abolishing nuclear weapons. The purpose should not have changed in these 20 years. Even though it seems that the purpose has disappeared from the surface in the meantime, I wish to believe that the purpose has always been recognized in the hearts of the people who participate in this conference. I believe that it is only when the purpose is confirmed once again at this Synposium, which has as its main themes nuclear desarmament and morals in science, that executive measures will truly have realistic meanings for nuclear disarmament.

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F. Janouch (Sweden)

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THE NECESSARY CONDITIONS FOR DISARMAMENT

If the Pugwash movement is to have even a small chance to succeed, it must determine and analyse in the most sober and complex way and without any prepossessions all the difficult problems, connected with disarmaments.

A retrospective glance on the history of attempts or failures to achieve the ban of nuclear weapons and the General and complete disarmament (GCD) lead us to rather pessimistic conclusions. Although it is obvious that the nuclear disarmament and a strict international control over plutonium and enriched uranium (and as a further step, GCD) represents the only real alternative of mankind for survival and continuation of civilization, it is not clear whether these goals are realistic and achievable in the present situation and if yes, what are the necessary and sufficient conditions.

There have been given many arguments supporting and underlining the meaning and necessity of nuclear disarmament and GCD. In my opinion two arguments have not yet been sufficiently accentuated.

The production of modern weapons and the continued arm races, which result in rapidly growing amounts of armaments and permanent replacements of obsolescent weapons systems, are extremely energy and raw-materials consuming. Since we obviously have to revise the widespread opinion about the affluence and abundance of the future society (such statement could be found not only in many science fiction books, but also in any textbook of marxismus-leninismus), the continuation of arm races, even in the optimal case of no global military conflict, will deepen the universal energy and raw materials crisis and will considerably speed up the arrival of a new crisis situation, consequences of which could be more dangerous and destructive than the global war conflict.

The arms races, however, even novadays are indirectly causing the death of tens if not hundreds of millions of people, who are starving to death or must die because of the insufficient medical care. (In the seventies estimates indicate 10-20 millions of people dying due to femine per year.) Is it not clear, that if only 1/3 or 1/2 of the means, globally spent on arm races and building up the most sophisticated war systems were to be spent for increasing the agriculture production or improving the medical care, these hundreds of millions would not have to die prematurely? Had someone tried to compare this number of

indirect victims of the cold war of so called detente with the number of victims of the last World War (60 millions victims)? Would this parallel and argument not be extremely useful in our campaign against nuclear weapons and arms races.

When analysing the history of failures to achieve even partial nuclear and conventional disarmament one is inevitably forced to the conclusion, that the common reason for all these failures lies in the political plane. To be more explicit: it is caused by the lack of democracy, human rights and freedoms and information in the various parts of the world.

The condition sine qua non for any disarmament agreement is complete information. The parties or participants of disarmaments negotiations or agreements must have full, clear and correct information not only concerning their respective military strength, armaments and war industry capacities, but also concerning the real plans and intentions of each of the contracting parties. The information, or more correctly, the free access to information concerning the real situation and intentions is the main condition for any successful disarmament talks or agreements. The existing information satellites, on line with computers and sophisticated programs, could give a sufficiently correct and reliable information about the existing armaments. They are, however, almost powerless for any objective determination of subjective intentions and plans of particular states or groups of states.

The free access to information is impossible without ensuring the free flow of information in all directions - along verticals and horizontals (up to down and down to up, from in to out and from out to in). Such free flow of information could not be ensured effectively without respecting the basic democratic norms and fundamental human rights and freedoms. I am of the opinion, that only in a pluralistic democratic society (no matter whether of capitalistic or, until now hypothetically, of socialist type) the free and undisturbed dissemination, reception and access to information could be guaranteed. Only in such a society one can ensure, that the information will not be made secret, will not be falsified, will not be lost in large quantities.

We are returning here to the old conception of Open World of Niels Bohr, where "real cooperation between nations on problems of common concern presupposes free access to information and unhampered opportunity for exchange of ideas must be granted everywhere ... full mutual openness, only, can effectively promote confidence and guarantee common security ..."

The Open World or "the opening of our world" is therefore the first necessary condition for any nuclear and conventional disarmament. The Open World, how-

ever, could not be created without the opening of all its constituent parts - and this is impossible without democratization, without respecting human rights and freedoms, without desecretization of every single society. In my opinion the centre of gravity lies here in socialist countries - without their deep and thorough changes and transformations all the proposals, talks and agreements are and will remain dangerous illusion - only.

Now to the second necessary condition for any real and effective nuclear weapons ban or disarmament.

Any of such agreements will only be meaningful provided, that at least a minimal political stability exists on our planet. All agreements have to be accepted, approved and ratified by the governments or political representatives of nations or states. Without the political stability or at least a political continuity of opinions of political representations any ban or agreement would stand on sandy foundations: a radical political change in only one of the contracting parties could provoke a chain reaction and the treaties, negotiated during many years could decay as a house of cards.

I consider it therefore correct to build in the factor of political instability of our present world in our discussions, in our proposals. Allow me to make a few comments concerning this problem. At present three main and different types of political instability can clearly be seen. Let us try to estimate their weight or relevance with respect to the disarmament problems.

I. The political instability of developing countries, which is connected with their rapid political growth, with the lack of experience and traditions, with their heavy economic problems, with the heritage of colonialism. These states are simply in statu nascendi, in the state of political formation. From the point of view we are here discussing, this instability seems to be the least tragic. Most of these states do not possess a sufficient industrial and military industry potential and one could have optimistic hopes, that simultaneously with the growth of their industrial power their political maturity and stability will also be growing. This, rather optimistic point of view, may, however, not be generally valid. The big power interference and arms supplies to conflict regions like e.g. Middle East certainly have a very negative influence on the respective political stability.

II. The classical western democracies are nowadays also facing a certain crisis situation and consequent political instability. The frequent changes of governments and almost permanent governmental crisis in many industrial western countries,

frequent elections , the splitting of the society in two almost equal parts (and nearly 50-50 elections results), the minority governments, the long-run economic difficulties, watergatelike affairs, the waves of terrorism - these all are symptoms of the political instabilities in the West. I do not dare and want here to analyze the reasons for them - they are certainly connected with social problems as well as with the fact, that the classical parlamentary system and some of its basic principles and doctrines cease to be valid in front of huge technical progress and profound changes (even revolution) in the information and communication systems. Because of a large industrial potential of these states the mentioned instability and lack of unity in this part of the world may seriously threaten the disarmament efforts.

III. The so-called socialist world and its various parts are also subjected to a considerable instability. In these states some of the basic social problems have been solved (but in no case all of them or even a majority of them) and some degree of social stability has been achieved. The important political issues, however, such as the state sovereignity and the right of nations for self-determination, democratization of the society, human freedoms and rights are far from being solved. These problems are multiplied by information problems. In most socialist countries a very strange, I would say suspicious attitude towards the free dissemination of information exist. The security restrictions exist in all fields and are of large dimensions. Secret (or classified) are not only the military information. Classified are also the plans of economic development, the plans of import and export, the internal political talks and negotiation, the balance of payments, the geological resources and discoveries, discoveries and experimental investigations. the maps, the wages in certain branches (I am quoting here verbally only a small part of the corresponding Czechoslovak governmental decree 149/1971). Every single scientific paper, no matter from what field, must undergo clearing before publication.

The consequences of this attitude to information are obvious. They create and support the general mistrust among the nations. But moreover, from the cybernetics we know that feedbacks are very essential for the stability of any closed system. Without a free, undisturbed flow of information the feedbacks cease to work. Further, absence of feedbacks leads to the accumulation of problems and contradictions and consequent instability of the system.

This particular chain - the lack of democracy, the violation of human rights and freedoms, the obstacles in the free dissemination of information - the absence of feedbacks and the consequent instability of the system is the main problem in socialist countries. The events in Hungary (1956), Poland (1956, 1970), GDR (1953), Czechoslovakia (1968), Tbilissi, Rostov, Taganrog

represent very clear examples of such kinds of instability.

I am of the opinion, that this closeness of socialist countries (in contradictions with the Bohr's openness) and the associated instability are very relevant for the creation of the proper atmosphere for disarmament agreements.

One should be not so naive as to think, that it is within the reach or even the main goal of the Pugwash movement to improve or remove at once all these obstacles of political character, which prevent or make the new designs of disarmament very difficult. At the same time it would be dangerous and even irresponsible to neglect these problems and build up our schemes and proposals on sandy foundations.

Much has been said in recent years about the crisis of mankind, about the holocast which our civilization is facing. Much has also been said about the ways out of this crisis. Alexander Solschenitsyn find the solution in the moral renaissance of mankind. It is certainly correct that without a moral attitude it would be difficult even to approach the mentioned problems. But I remain too materialistic to believe, that the moral purgation only could bring the superpowers to change their politics, to respect the independence of the small nations, which happen to be in THEIR spheres of influence, to abolish the spheres of influence, to stop the arms supply to the conflict regions, to self-deny the profits from arms production and sales.

Though the moral, ethical and humanistic principles must form the basis for all of our activities, the scientists main contribution must lie in the sober analysis, in proposing realistic solutions and alternatives. Our voices have, or should have, a considerable weight in public affairs, since our overtechnicized world is based on the results of science and engineering and since the main problems of mankind and civilization (energy and raw material crisis, famine, pollution, environment) could not be solved without science, scientists and engineers. The majority of scientists are simultaneously well experienced lectors and pedagogues - it should be within the reach of their capacities to make our fears and proposals understandable - and influence public opinion, to establish communication channels between scientists, politicians and the public, to disseminate and teach these simple but important truths not only in schools and universities but also in the mass-media etc.

A considerable moral strength and somewhere even a great civil courage is required to speak out these truths and call the things by their own names. The public responsibility and civil courage are not alien to the scientist - the names of Einstein, Bohr, Russell or Sakharov are well known not only among us.

Since Man made his first step into space there is much more to unite mankind than to divide it. We cease being members of individual races, nations, continents or classes - we are becoming much more members or even citizens of one inhabited planet, which is under a very acute threat to become soon uninhabitable. It is our scientist duty to undertake everything possible to make prevail in actions of governments and politicians all-human motives over political, national or class interests. I believe, that the present state of science and technology not only admits but even categorically requires such an attitude.

25th Pugwash Symposium
A New Design towards Complete Nuclear Disarmament
(The Social Function of Scientists and Engineers)
Kyoto, Japan, 28 August - September 1975

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A POLITICAL DESIGN FOR WORLD DISARMAMENT

Introduction

Thirty years after Hiroshima and Nagasaki, despite the tortuous but unmistakable progress of "détente" in the arena of international politics, nuclear arms race goes on unabated and the world's military expenditure continues its upward spiral. According to the recent statement of Congressman Simon, the United States alone possesses today a stockpile of nuclear warheads with the explosive force of more than 610,000 Hiroshima-type atom bombs.[1] The nuclear stockpile of the Soviet Union is probably of a similar scale. This state of affairs already is sheer insanity but, what is worse, the race to develop nuclear weapons is still continuing. Why is this so?

One reason lies in the development of military technology, which has triggered the vertical nuclear arms race and horizontal nuclear proliferation. The statement of the U.S. Secretary of Defense Schlesinger in January 1974 clearly exemplifies the vertical nuclear arms race. He said that the United States was shifting from the "counter-city strategy" of the past twenty years to a "counter-force strategy" directed to Soviet military installations. What lies behind this shift is the fact that, both for the United States and for the Soviet Union, technological development has produced a higher degree of accuracy of the missile delivery systems.[2] It goes without saying that mutual adoption of "counter-force strategy" increases the incentive for a preemptive first strike and accordingly increases the fear of preemptive attack by the other side, thus creating an extremely dangerous situation.

As for horizontal nuclear proliferation, it is also a product of technological development in the sense that, first, it reflects the spread of nuclear technology and, second, a country that comes late to the field of nuclear development can acquire a more efficient technology for developing its nuclear capability than the pioneer countries.

Thus the endless arms race appears to be the inevitable product of the progress of military technology. In fact it is said that, in the process of developing new technology, the United States, for instance, having developed a new weapon, often proceeds to develop counter-weapons independent of the actual development of counter-weapons by the Soviet Union. Here is a manifestation of the self-perpetuating chain reaction of military technological development.

Has the progress of military technology, then, of necessity produced today's arms race? Obviously it has not. It is by humans, organizations and society that technology is developed and employed; technology does not develop by itself.

It is true that improved accuracy of missile delivery systems may bring about a shift to counter-force strategy; on the other hand, precisely because of the danger that the improved accuracy may create an extremely unstable military balance of power, it can equally lead to a redirection of policy from continuing arms race to disarmament. Which direction to take is a matter of political choice, not a matter dictated by technology. The same can be said about nuclear proliferation. Political choice, not technology, determines whether the United States and the Soviet Union, in view of the technological feasibility of nuclear proliferation, would attempt to solidify their nuclear superiority and virtual monopoly or would take the initiative for a global nuclear disarmament.

The issue of arms race must, therefore, be considered in its political context. What political conditions provide the basis for today's arms race? What political conditions are obstructing disarmament? What are the political conditions that can promote and materialize disarmament? By formulating the problem in the context of political choice we would be able to identify the implications of the disarmament question for individual humans as political actors. Let us then make analytical observations of the political context of the disarmament problem.

Patterns of "Military Growth"

Disarmament is not only an end that ought to be attained; it must also be a goal that can be attained. This does not mean that it is attainable

without changing the existing international system. It means that disarmament, while calling for a transformation of the existing international political system, presupposes that kind of transformation of which the origins and causes are inherent in the present international political system. Accordingly, before inquiring into the feasibility of disarmament in this sense, we will examine the relevant trends that are observable at the present time.

Let us review the current trends of armament by using the concept of "military growth". "Military growth", as I use the term, can be measured by two indicators — the size of a country's military expenditure and its rate of increase (or reduction). Using these as criteria of classification, we can divide countries of the world into four categories.

The first type, which we will call the "First World", is characterized by huge military expenditure but a low rate of its growth. In 1972, only the United States and the Soviet Union had military expenditures exceeding — in fact far exceeding — $50 billion, the two accounting for two-thirds of the total military expenditure in the world. On the other hand, the average annual rate of growth of the military expenditure for the decade between 1962 and 1972 was less than 1% for the United States and 3% for the Soviet Union.

China is next only to the two superpowers in terms of total expenditure that is estimated to be approximately 9.5 billion dollars in 1972; on the other hand, in terms of its high average annual rate of growth of approximately 9%, China resembles the "Third World" described below.

The second type, or the "Second World", is characterized by a medium size of military spending and a low rate of its growth. Chief examples are the United Kingdom, France and West Germany, whose military expenditure was a little over $5 billion, respectively, while the average annual growth rate of each was approximately 1%.

The third type, or the "Third World", is characterized by a relatively low level of military expenditure but a high rate of its growth. This group includes Saudi Arabia, Iran, Egypt, Pakistan, India, Nigeria, Brazil and the majority of other newly emerging nations. Also falling into this category are most East European countries and some countries of the Western camp such as Japan and Australia. Israel also manifests these features.

Of these, the rate of growth for the newly emerging nations (and Israel) is particularly high. For Saudi Arabia, Iran, Egypt and Israel, for instance, the average annual growth rate for the decade ending in 1972 was approximately 20%. Needless to say, the growth rate of military spending of oil-producing countries has risen even more sharply since 1973.

Lastly, the "Fourth World", as the term is used here, includes those countries where both the present level of military expenditure and its rate of growth are low, as illustrated by Afganistan, Nepal, Burma and Haiti.[3)]

This division of the world into four categories in terms of "military growth" corresponds to a considerable degree with the common typology of four worlds based on the measurement of the level of economic development and the degree of self-sufficiency in key natural resources. There are some interesting deviations from the typology defined in economic terms: for example, China is next only to the superpowers in one respect and is of the type similar to the "Third World" in another respect; Japan is close to emerging nations as far as "military growth" is concerned. We would, however, not eleborate on these points in this paper.

Here, we would stress the following two points. First, the military expenditures of the United States and the USSR, comprised in the "First World", are so enormous as to account for two-thirds of the world's total military expenditure. Even though China stands next, she trails far behind, the United States and the USSR each spending seven or six times as much as China. Consequently, even though the growth rate of the military expenditure for those two superpowers is low, no change should be anticipated for the time being in the pattern of disarmament efforts focused on the United States and the Soviet Union.

Secondly, the four types defined in terms of "military growth" roughly correspond to four patterns of external behavior of today's nations. The behavior of the United States and the USSR, principals of the "First World", is heavily colored by the so-called "big-power hegemonism". "Big-power hegemonism" does not mean only that they are big powers but also refers to their policy of maintaining a dominant position vis-à-vis other nations, as testified by the existence of "spheres of influence". In contrast, the external behavior of the "Second World" nations is characterized

by "internationalism". This does not mean that countries of this type are especially motivated by the spirit of international cooperation. It is "internationalism" in the sense that they have basically accepted the reality that, in order to pursue their self-interest under present-day conditions, they are obliged not to act individually but to institutionalize a system of equal and horizontal division of labor in collaboration with selected foreign countries and, to that extent, to accomodate themselves to virtual limitations on their national sovereignty. The membership of France, West Germany, the United Kingdom and others in the European Community is a case in point.

Generally speaking, the primary characteristic of the external behavior of the "Third World" nations is "nationalism". Although Japan and some East European countries may constitute slight exceptions, nationalism is undoubtedly the dominant feature of this world. There has also been in this world some institutionalization of regional or international cooperation among developing countries. But even this tends to be in the nature of international concerted action for the sake of establishing national sovereignty, as exemplified by their joint effort to legitimate "permanent sovereignty over natural resources" through United Nations resolutions. Lastly, the "Fourth World" is often characterized by virtual "isolation" or isolationist "neutralism" as a matter of deliberate policy.

In light of the type of international behavior, our primary concern has to be focused again on the military power of the United States and the USSR of the "First World" associated with their "spheres of influence". This is not to neglect the problems of the "Second World" or especially of the "Third World" that is in flux. But unless the problem of "big-power hegimonism" of the "First World" is first taken up, it will be difficult to proceed to the problems of the other three "Worlds".

How, then, is it possible to achieve the reduction of the military capabilities of the United States and the Soviet Union? To answer this question we have to identify the conditions that generate and promote arms race of superpowers.

Political Structure of Arms Race under Détente

The arms race between the United States and the Soviet Union has continued uninterrupted for nearly three decades since the late 1940s. Even though arms race as a military phenomenon has been constantly underway, its political context has undergone a significant alteration.

The most important motivating factor of the arms race up to the early 1960s, which we will call "cold war arms race", was the mutual distrust and fear between the United States and the USSR. The system of distrust and fear that is inherent in inter-nation politics was coupled with ideological conflict to produce the situation called the "cold war". This gave rise to the vicious circle of arms race that can be aptly conceptualized by applying such analytical frameworks as the "Prisoner's dilemma" and the "Richardson model." In other words, it was a vicious circle of actions and reactions which, under conditions of the shortage or absence of crucial information concerning the intention and capabilities of the adversary, were taken by assuming the worst of possible cases.

Of course arms race was not caused solely by the distrust and fear between the United States and the Soviet Union; in fact, other factors have been pointed out as well. For instance, President Eisenhower gave in 1961, the famous warning against the "military-industrial complex". Similarly, the Soviet Union advanced the classical thesis that attributed the structural foundation of arms race to the capitalist system itself. Nevertheless, in the West of that time, the military-industrial complex was given only secondary importance. On the Russian side, the publication in 1972 of a United Nations report, "The Economic and Social Consequences of Disarmament", that, as a joint work of experts from both East and West, presented the official view that disarmament and the capitalist system were compatible and indicated that the classical Marxist-Leninist interpretation of arms race was no longer given primary importance by the Soviet Union.

Thus, the dominant factor of cold war arms race was, and was perceived to be, the political and psychological distrust between the

United States and the Soviet Union. Consequently, the strategy for moving from the cold war to détente focused on efforts to increase and improve political communications. The Cuban missile crisis of 1962 with its subsequent process of easing a tense military confrontation was a dramatic starting point for such communication. This was followed by a series of summit talks and by the Kissingerian cloak-and-dagger diplomacy, leading to the promotion of "détente".

Notwithstanding that, arms race is not over. On the contrary, the arms race between the United States and USSR, particularly on the level of nuclear weapon systems, has assumed the character of an even sharper qualitative contest. In other words, in place of cold war arms race a new type of arms race under conditions of political detente, what might be called "détente arms race", has emerged. But why, if political distrust between powers is the primary cause of arms race, does détente not lead to its end? What indeed are the causes of détente arms race?

Three interpretations have been put forward with regard to this point. The first is the view that, even under "détente", there still remain distrust and conflict between the United States and the Soviet Union. This view holds that essentially the cold war has not come to an end. In fact there is still a strong distrust of the Soviet Union on the part of conservatives in the United States, and the same is probably true of the distrust of the United States among conservatives in the Soviet Union. Further, a view that curiouly coincides with this is held by China, which maintains that the US-USSR "détente" is a sham, that "a terrible struggle for world hegemony is underway between the two superpowers," and that there is a great danger of war between the United States and the Soviet Union.[4] In any event, many people still hold the view, if not as extreme as this, that distrust and conflict between the two superpowers remain unresolved and the relaxation of political tension that has been achieved to date is not of sufficient degree to bring about the end of arms race.

The second interpretation, in contrast, maintains that the arms race by the United States and the USSR is a means to establish and perpetuate the hegemony of the two superpowers and has its foundation in their common interest. France was an early exponent of this viewpoint.

For instance, Premier Debré of the De Gaulle administration justified France's nuclear development in 1959 on the grounds that France must "avoid being crushed by agreements between the two very big powers". It is well-known that De Gaulle himself did not make secret of his opposition to the "hegemonic tendencies" common to the United States and the Soviet Union.[5] This view seems to differ from that of China in its emphasis on the element of agreement or collusion between the hegemonic policies of the two superpowers.

If one holds the view that the United States and the USSR seek their condominium over the world, the fact that the US-USSR détente and the arms race between them are simultaneously proceeding is not in the least surprising, because their military power can be considered being directed not so much to each other as to their own allies and third countries.

The third interpretation takes the view that the primary cause of the arms race by the United States and the Soviet Union does not lie in inter-nation relations but stems from internal political structure, particularly the military-industrial-bureaucratic complex. In this view it is equally not surprising to see that arms race is continuing in spite of the relaxation of political tension between these powers.

As mentioned above, an awareness of the role played by the military-industrial complex is not new; however, two significant developments have taken place in today's intellectual context of the discourse. First, against the background of continuing arms race under conditions of détente, a view has gained prominence that attributes, unlike in the cold war period, primary importance to the domestic political structure. As reflected in such concepts as "bureaucratic politics" (G. Allison and M. Halperin) and "bureaucratic revolution" (R. Barnet), the approach that emphasizes bureaucratic systems as an independent variable in the context of foreign policy making has recently gained wide currency in the United States.

Secondly, in contrast to the cold war period, the view has become increasingly common which points out the correlation between arms race and domestic structure not only regarding the United States or a capitalist system but also with respect to the Soviet Union. Under socialism, although the "industrial" sector obviously plays a different political role from

that in a capitalist society, it can hardly be denied that there are problems created by the system of military-bureaucracy. For instance, as early as 1960, Khrushchev at a luncheon with American visitors to the Soviet Union was reported to have made critical comments on the resistance by the military to the policy of détente. It has also been pointed out that the military openly objected to the partial Nuclear Test Ban Treaty of 1963 and the Strategic Arms Limitations Talk since 1969.[6)]

These are the three interpretations regarding détente arms race. To sum up, the first interpretation concedes the contradiction between political détente and arms race and goes on to explain arms race by pointing to still persistent political tension. The second interpretation is based on the view that détente and arms race are mutually compatible and even complementary. From this standpoint, in order for the United States and the Soviet Union to justify to the rest of the world the enormous military power they deem necessary to consolidate their hegemonic position, it is to their advantage that, to the extent conformable to this purpose, conflicts persist — or appear to persist — between the two. The third interpretation takes the view that détente and arms race are unrelated, as it were, and that even with a relaxation of tension between states, domestic factors can still lead to arms race. This view also holds that the military-bureaucratic systems in the United States and the Soviet Union share a common interest in the sense that they both have vested interests in the arms race.

Which of the three interpretations is valid? Probably such a question is in itself not pertinent. It is more accurate to say that each of the three contains an element of truth, and that is why détente arms race has its unique complexity in comparison with cold war arms race.

The problem then is to explore how this détente arms race with its threefold character can be transformed into disarmament , and to identify the conditions of such/a transformation and the motive force for disarmament. dynamics.

Counter-Trends towards Disarmament

A key to the transformation of détente arms race into disarmament dynamics can be found precisely in the counter-trends inherent in each of the three aspects of détente arms race referred to above. That is to say, today's arms race is a composite of three factors — the trend toward continuing tension among powers, the trend toward maintenance of superpower dominance, and the trend toward preservation of internal vested interests in arms race. What is extremely important is the fact that each of these trends generates within itself a counter-trend in favor of disarmament.

First of all arms race that is intended to pursue "security" in the context of international conflict is briging about, due to increased accuracy of the missile delivery systems and various other reasons, extremely insecure and unstable conditions. In order to attain and maintain their own security, therefore, the United States and the Soviet Union must seek a change of course away from arms race. This is the first counter-trend inherent in the current trends.

Second, if the two superpowers agree to solidify their hegemony and to take concerted actions, this fact itself erodes the unity within the two camps and inevitably promotes a counter-trend toward global multi-polarization and decentralization of international political power, extending to the developing areas as well. Third, the growth of a huge bureaucratic system at home has fostered a sense of political alienation in society and created the counter-trend toward erosion of authority and belief-systems supporting the polity. For instance, the decline of military values and sysmbols in the West is a case in point, as is reflected in the lowering morale and discipline among soldiers of NATO forces or in the shift of many countries from conscription to the voluntary enlistment.

With regard to the contradictions and dynamism inherent in détente arms race, particular attention should be paid to the following points. First, although the contradiction between arms race and security is nothing new, it has become even more difficult to justify arms race by the logic of external "security" because of détente where, in contrast

to the cold war era when distrust and fear between the two superpowers were the primary cause of arms race, their relative weight has been reduced to being only one among several factors. In other words, the superpowers are forced to concede that under the circumstances arms race is too costly a means in proportion to the benefit that may derive from achieving "security".

Next, the second and third trends — namely, the maintenance of super-power dominance and the preservation of vested interests of the bureaucratic complex in arms race — involve in common the attempt to maintain a giant system of control. One is the trend toward the maintenance of a giant international system and the other a giant domestic system, both constituting systems of political dominance. That is precisely why there have developed international resistance against dominance by the superpowers and domestic resistance against control by the military-industrial-bureacratic complex.

These contradictions and challenges inherent in détente arms race are quite serious, so serious that the parties to arms race themselves have begun to deal with the dilemmas. Hence the "arms control" approach. This approach is characterized by attempts to minimize the contradictions and disruptions within the existing system without altering its fundamental structure. Herein lies its limitation.

For example, in order to respond to the first challenge — the contradiction between arms race and security — internatioanl arrangements have been concluded to keep to the minimum the danger of war by accident or miscalculation and of environmental pollution attendant upon weapons development. It is true that these steps have made some achievements. But obviously whenthe counter-city strategy is being replaced by counter-force strategy, the efficacy of the earlier measures to prevent accidents and miscalcualtions is bound to diminish. As regards the most crucial point — namely, the development and production of weapons — the arms control device hardly serves as effective restraint. For instance, the Vladivostok summit talk of November 1974 was hailed by the parties as a "breakthrough" in the history of SALT negotiations. But, as is well-known, it not only places the upper limit of the number of strategic weapons at a level higher than the existing stockpiles but also contains the danger of promoting the development of MIRV and intensifying qualitative arms race.

These deficiencies might even be counted as advantages from the standpoint of the second consideration — the maintenance of superpower dominance. The arms-control-type response to the international challenge to superpower dominance has not gone beyond attempts to keep the decentralization of international power to no more than a "pentagonal structure" and to freeze it as a "structure of peace". This approach, however, has already been challenged by oil-producing countries. As regards the third issue — the challenge to the military-industrial-bureaucratic complex — the arms control approach has been slow to react. This is probably a natural consequence of the fact that this approach is essentially a form of technocratic social control. We must conclude that after all Singer's remark more than a decade ago, that "both deterrence and arms control would seem to be essentially stop-gap measures", is even more valid today.[7]

In contrast to "arms control", the "disarmament" approach faces the issue more squarely and endeavors to solve the problem at its root. Further, the goals and rationale of the disarmament approach are also related to the three trends and counter-trends mentioned above. That is to say, disarmament is better suited than either détente arms race or arms control (1) in overcoming the danger of arms race to achieve international peace and security, (2) in transforming the structure of big-power dominance to establish international democracy and well-being, and (3) in altering the giant bureaucratic system to ensure democratic participation and well-being on the domestic level.

Inception of Nuclear Disarmament

What then are the steps to take for going beyond détente arms race and arms control in the direction of disarmament? As stated earlier, a design for this process must stem from the existing contradictions and counter-trends as the point of departure.

Thus the first stage for redirecting arms race toward disarmament can properly be envisaged from the perspective of the superpowers pursuing their own security. The dilemma that arms race and weapons development today threaten the security of the superpowers is best exemplified by the fact that both the United States and the USSR possess more than sufficient nuclear arms for "over-kill". This refers not only to the quantitative excess that enables each to destroy the other more

than ten times. The existence of excessive nuclear weapons in itself gives rise to a shift from counter-city to counter-force strategy, which is more aggressive and requires a greater number of warheads and missiles. At the same time the adoption of counter-force strategy makes it easier to rationalize post factum the possession of surplus weapons already manufactured. In this sense, the quantitative excess of arms leads to a qualitative change in strategy. It is therefore not surprising that some of the policy-makers in the big powers have suggested that first of all the excessive weapons be eliminated. Former science advisor to the President of the United States, Herbert York, for one, has made the following proposal.

In his view, cities in the Soviet Union that can be regarded by the United States as significant targets for nuclear attack number at most one hundred. If we suppose for the moment that the number is 200, and further that there are also 200 similar targets for attack in China, the total comes to 400. Even if we assume that each of these targets is double-targeted to allow for possible missile failure, the total number does not exceed 800. On the other hand, even subtracting a certain percentage of nuclear warheads that are not available for launch at all times, the United States still possesses no fewer than 5,300 nuclear warheads ready for instant launching. Thus the difference of 4,500 constitutes the excess, which must have been targeted on military installations.[8)]

The number 800 in York's proposal constitutes the level of "minimum deterrence", but it is not necessary to attach positive significance to this specific figure. What should be stressed here are the following three points. The first relates to the fact that the number of excess weapons that can be abolished is extremely large. Therefore, if even the proponents of "deterrence" strategy can agree to such a large-scale reduction, and if in fact the United States and the USSR destroyed such a large number of excess weapons, that in itself would be a beginning of considerable significance. At the same time, if those who subscribe to the doctrine of nuclear deterrence agreed to this large-scale reduction, it would amount to an admission of how imprecise the concept of "deterrence" is and how "deterrence" strategy itself has contributed to the production of over-kill capabilities.

Second, what is most important here is not the figure 800 nor "minimum deterrence" as such, but the very process of abolishing a large quantity of nuclear weapons and the pattern of behavior involved in the process. If, for example, the United States, which has nuclear superiority, unilaterally eliminates several hundred of its most modern missiles, and calls on the Soviet Union to reciprocate for a similar reduction, thus eliciting positive reaction from the Soviet Union, she will succeed in starting a cycle of disarmament dynamics as well as a process of political "confidence-building". This will mitigate the distrust between powers that is one of the causes of détente arms race. And, what is more important, if this process of confidence-building continues and generates a momentum, political conditions can be created which permits a continued arms reduction not only to the "minimum deterrence" level of 800 but way beyond. Furthermore, since the act of unilaterally eliminating most modern missiles means in fact a declaration to end the contest for weapons development, it will be possible, along with arms reduction, to accede to a total nuclear test ban agreement.

Third, what has always constituted an obstacle to arms reduction is the issue of inspection and verification. However, in the case of nuclear weapon delivery systems, and large missiles in particular, it is not difficult to dismantle and eliminate them openly and with advance notice, allowing inspection and verification by reconnaissance satellites of the other side. Further, it is quite conceivable to use this dismantling operation for the purpose of/political demonstration of good will and peace- oriented policy of the disarming nations. It is true that a unilateral inspection of nuclear warheads such as MIRV is probably not technically feasible, but the choice available to the superpowers is either not to undertake missile reduction on that ground, or to undertake it despite the problem of MIRV and thereby to improve the political climate which in turn will further reduce the priority of verification.

What is noteworthy in this connection is the fact that disarmament under détente has the advantage of being not so dependent on inspection and verification as disarmament in the cold war situation. This is an outcome of the relative decline in weight of the factor of distrust between powers and, to that extent, there is also less danger of being

caught in the dilemma: "Inspection first, or disarmament first?" While the need for international inspection thus relatively diminishes, there is under détente a greater opportunity for domestic inspection. In other words, the third counter-trend described above — namely, increasing resistance to giant military-bureaucratic systems — is far more likely to gather strength under détente than during the cold war, and domestic inspection in the form of people's surveillance of arms reduction will become more effective. Here is a link between disarmament and democratic control.

Two Paths to World Decentralization of Power

Thus, the initiation of nuclear disarmament will meet the first requirement of ensuring the security of the United States and the Soviet Union. Similarly, the third requirement, that of securing democracy and well-being at home — both or at least one of them — is a demand that can and should be accommodated by the two superpowers. Consequently, the greatest remaining possible obstacle to nuclear arms reduction will be the expected resistance of the two superpowers to a voluntary relinquishment of the military superiority that they enjoy vis-a-vis other countries. Viewed from this perspective alone, it would seem unrealistic to expect the United States and the Soviet Union to undertake nuclear disarmament. But what other alternatives do the two superpowers have?

One alternative is to proceed with détente arms race. However, if arms race continues while political conflict and distrust between the United States and the Soviet Union persist, their own security is bound to be jeopardized. If on the other hand, arms race continues while politicl relaxation progresses between the United States and the Soviet Union, military dissociation of the allies from the two superpowers and proliferation of military power including nuclear arms are likely to ensue, inevitably undermining the dominant position of the superpowers. Another alternative that will permit the United States and the Soviet Union to escape this dilemma would be to maintain their dominance through a joint US-USSR arms development. The kind of joint enterprise already undertaken in the area of space exploration might be applied to the military field to establish a global "condominium" by the United States and the Soviet Union. However, a difficulty also arises here, because a US-USSR condominium is likely to

generate common resistance by other nations and encourage their nuclear development including nuclear arms proliferation.

In short, the policy of perpetuating the dominance of the superpowers contains a fundamental dilemma. The only remaining alternative, then, is clear. It is for the United States and the Soviet Union to recognize the fact that, in the long run, an international system dominated by superpowers cannot be beneficial even to themselves. On top of that, it is in their interest to seize the initiative for disarmament of their own accord, and thus to opt for the establishment of a global system of disarmament before it is too late.

Two important points should be stressed in this connection. First, we must not fail to recognize that, in the course of history from the present to the future, there will be a mounting demand for dispersion of power as an almost irreversible current. This is reflected in the trend toward multipolarization on the international level and decentralization on the domestic level -- namely, the growing demand in both international and domestic spheres for a greater extent of participation in the decision-making process. This does not always mean that units of political and economic life are becoming smaller. There are also moves for larger units, such as the European Community. The crux of the matter, however, is not the size of the unit but its structure. It is noteworthy that the European Community, while proceeding with economic integration, has not yet clearly formulated the image of the end state of political integration. This is in part due to the fact that it is no easy task to envisage a new structure for a larger unit that will meet the demand for decentralization and participation as against a giant centralized system.

The problem, however, lies in the fact that the demand for and trend toward decentralization can lead to two diametrically opposite directions. On the one hand, there is a possibility that the demand for political decentralization may lead to military proliferation, accelerating the proliferation of nuclear arms. Obviously, this would be an extremely insecure and dangerous world. There is, however, another possibility -- namely, political decentralization will be achieved without being accompanied by military proliferation. This would be a world in which a more equal and democratic international relations have been established. In such a

world it would be possible to maintain the minimum level of peace and order with a moderate-scale United Nations police force. Which of these two models will be realized depends on whether political decentralization can be successfully separated from military proliferation, and this, in the final analysis, depends on whether global disarmament can be materialized. Consequently, if the United States and the Soviet Union are to choose the second model, it is obvious that they must begin by taking the initiative for disarmament.

Second, if the United States and the Soviet Union have accomplished large-scale nuclear arms reduction, we must proceed to the next stage by placing on the agenda for disarmament reduction of nuclear arms by China, France and the United Kingdom. Judging from the posture of China and France to date, this may appear to be a terribly difficult task. Particularly, the conflict between China and the Soviet Union is bitter and entangled. If the Soviet Union were to choose voluntarily to reduce its nuclear arms and to cut down its own position as a superpower, however, it will serve as a powerful evidence of its rejection of "hegemonism" and undoubtedly contribute to the relaxation of tension between the USSR and China. The creation of such a political climate will in turn facilitate China's participation in nuclear disarmament at the next stage.

The "Three Worlds" and Disarmament

It follows from the above analysis that the second stage of disarmament following the large-scale reduction of nuclear arms by the United States and the Soviet Union would have to meet the following conditions. First, it must be a global disarmament involving not only the "First World", but the "Second" and "Third Worlds" as well. Second, it must be a general disarmament including both nuclear and conventional weapons. Third, parallel to the progress of disarmament, an international peace-keeping machinary to maintin the minimum level of world order must be established. This must be a peace-keeping machinary compatible with political decentralization, and it is neither necessary nor desiable to make it anything more than a reinforced United Nations police force and the stand-by forces earmarked for the use

of the United Nations, both consisting of contingents from medium-sized and smaller countries. Proponents of world federalism often advance a blueprint for unified peace-keeping force more powerful than the armed forces of any member states. However, such an overwhelmingly powerful machinary has the danger of itself generating conflicts over the issue of who should control it.

It is not necessary to argue in detail the measures, steps and arrangements that are conducive to the fulfillment of these three conditions. For one thing, various possibilities with respect to the details of the second stage will open up precisely in the course of progress to the first stage, and it is rather futile to try specifically to predetermine what the second stage should be like. Here, we would do no more than suggest some basic ideas regarding the first condition. The first condition is being singled out because, as global disarmament involves three "Worlds" with their different structures and standpoints, each of the three "Worlds" can be expected to take its own unique approach to disarmament.

Accordingly, in the second stage of disarmament, the "First World" (including France and the United Kingdom for that matter) must see to it that, while their own disarmament program is under way, they also cease arms export to other countries. This is one of the essential conditions for separating political multipolarization from military proliferation. Until now, the emerging nations have been opposed to the idea of banning arms export, chiefly because it was considered to lead to the perpetuation of the gap between the North and the South in the form of monopoly of modern weapons by the highly industrialized countries. If, however, industrialized countries themselves that have the capacity to export weapons take steps toward disarmament, this objection will eventually lose its grounds. Today, arms race and arms export by industrialized countries, particularly the "First World", are going hand-in-hand; what is needed is precisely the opposite -- to let disarmament and the ban on arms export proceed hand-in-hand. The ban on arms export may create certain temporary problems regarding emplyment and balance of payment; however, the "First World" must recognize that this is a matter of long-term security of its own as well as of others.

As for the "Second World" consisting of highly industrialized countries which are allies of the United States (including Japan for that matter), they are historically endowed with the conditions favorable for creating, as they curtail armament, advanced welfare states surpassing the United States and the Soviet Union. That is to say, they are capable of building a model society on the basis of a more progressive disarmament programs than others, giving an impact to the "First" and the "Third Worlds" by serving as an example, and thus encouraging disarmament by these two Worlds. It goes without saying that it is not an easy task to create a model society today where not merely a high level of consumption but also material and cultural conditions for a self-fulfillment of humans are to be realized. But it is a challenge worth accepting. In other words, the "Second World" nations should not be content with symmetric disarmament, responding in kind to arms reduction by other countries; they should proceed with disarmament at a faster pace than the superpowers, and promote global disarmament through the asymmetric response in the form of building a model society.

Such a policy may appear at times to the superpowers as a "free ride". In fact, Japan has been a case in point. Had disarmament been an impossible goal, there might be some justification for Americans in criticizing as a "free ride" Japan's policy of spending relatively little on armament. But, inasmuch as disarmament is possible, postwar Japan, whose military expenditure has not exceeded 1% of GNP in the last two years, can be considered a society that acted in anticipation of world disarmament. The low military expenditure of postwar Japan has not only contributed to her economic growth, but, coupled with the decline in value of military symbols in the wake of Japan's defeat in 1945, no doubt made significant contribution to the transplantation to the Japanese soil of democratic values on the political, cultural and educational levels. In this sense, the "free ride" itself can serve as a model.

Next, from the standpoint of the "Third World", and the developing countries in particular, the existing global system of military power serves above all as a pillar of the system of control by the North over

the South. One of the important differences between cold war arms race and détente arms race is the following: the former, while containing in reality the element of North's dominance over South, was primarily conceived in terms of East-West conflict; in the case of détente arms race, however, the fact that it performs the function of being the mechanism of political control both on the international and domestic levels has unmistakably come to the surface. Many developing countries consist of the structure of dual control -- namely, the international control of the South by the North and the domestic control of the masses by élites within countries of the South -- and the world weapon system as a whole serves to sustain this dual structure of control. For the Third World, therefore, disarmament is not only a question of peace among the big powers, but should mean above all a precondition for liberation of oppressed peoples.

Nevertheless, arms are frequently purchased from the North by the South with the view to attaining liberation and independence from the North. However, such action has generally resulted in promoting the North's arms race, increasing the South's technological dependence on the North, and exacerbating armed disputes among the countries of the South. This by no means is the road to liberation and independence from the North. The proper course for the emerging nations should be precisely the opposite.

The first thing what the developing countries must do in order to attain autonomy is to solve conflicts and disputes among themselves through their own efforts by taking recourse to non-military, peaceful means. Armed conflicts between countries of the South only increase their dependence on military supplies from the North as well as the danger of military intervention by the North. A surer way to liberation and autonomy of the emerging nations is to achieve non-military resolutions of their conflicts, to neutralize thereby the weapons of the North, and furthermore to promote disarmament by the North through a boycott of the weapons of the North. It is through such reduction of military

dependence that the South can increase their ability to gain more effectively concessions and cooperation of the North for bridging the economic gap between the North and South. And this, in turn, will promote disarmament by the North and the transfer to the South of well-being disarmament in the North will yield.

The second step that the Third World countries must take to attain autonomy is to achieve the liberation of the masses at home and to eliminate oppression by the privileged military régimes. Obviously not all military régimes in developing countries are to be repudiated. However, the more a military régime is removed from the people, the greater its degree of dependence on the military assistance or purchase of arms from the North. Therefore, it is through establishment of political authority rooted in the people that the developing countries can acquire freedom from military dependence on the North and, through it, contribute to promoting disarmament in the North.

Basic Model of Disarmament

These are the points we must take into account in regard to the actions the three "Worlds" should take at the second stage of disarmament. Needless to say, global disarmament must continue to go forward to stillfurther stages. It would not be necessary here, however, to draw up a scenario for the ensuing stages, because what has been stated already points to the motive force and basic model for the process of disarmament. To sum it up, it consists of a cycle in which big military powers which possess relative superiority take the first initiative for disarmament; this will result in the reduction of their military control over other countries; those other countries in turn will gain relatively increased political influence and put pressure on the big powers for arms reduction, thus promoting further disarmament by the big powers. This is a model representing a cycle where disarmament promotes political decentralization, and political decentralization in turn promotes disarmament. If this basic model of disarmament process is continuously recreated, it should be possible to proceed ultimately to general and complete disarmament.

The implications of this model may be restated as follows. (See the matrix below.)

	Dominated	Not dominated
Dominate	Second and Third Worlds	First World
Not dominate	Fourth World	General & Complete Disarmament (Global nuclear proliferation)

Patterns of behavior in international relations can be classified into four categories: (1) dominate, (2) do not dominate, (3) dominated, and (4) not dominated. Combination of these will make the following four types: (a) those that dominate but are not dominated, namely, the "First World", (b) those that are dominated but also dominate, namely, the "Second World" and the "Third World" (particularly the bigger powers in the Third World), and (c) those that are dominated but do not dominate, namely, the "Fourth World". Inter-nation relations of type (d) where nations neither dominate nor are dominated will conceivably emerge under two different conditions. One is "global nuclear proliferation", that is, the condition in which all countries are armed with nuclear weapons. At one point, China advocated this model, but she has not been heard recently to actively endorse it, probably because China too has recognized that this model, in which nuclear armament is introduced into Hobbesean state of nature, will lead to an extremely insecure and dangerous situation. The other model is "general and complete disarmament". In essence, our analysis has been devoted to delineating the basic contour of a design whereby worlds of (a), (b) and (c) converge on a world in which general and complete disarmament has been achieved, a world in which none dominates and none is dominated.

The road to this goal will not be an automatic, linear process. It will be a process which requires constant efforts, pressures and unerring decisions in the direction of disarmament. It will also be beset by reactions and regressions. To repeat, however, the most fundamental choice comes down to the decision whether, on the basis of the recognition

of political decentralization as an irreversible demand and trend, military proliferation is to be separated from it or not. The decision to choose not to separate the two will move the world in the direction of "global nuclear proliferation". The choice for us is clear.

To be sure, "general and complete disarmament" is not an objective that can be attained in the near future. This does not mean that it is an "unrealistic" goal divorced from the present reality. Today, we have come to the realization, in connection with problems such as environmental pollution and depletion of resources, that "We must not colonize our future generations". This is a view based on the awareness that we of today have the power to determine the fate of the world of tomorrow. True, "general and complete disarmament" will not be attained in the very near future. On the other hand, probably no one believes that, fifty or a hundred years hence, US-USSR and Sino-Soviet conflicts will remain unchanged, or that the nation-state-system that has a history of no more than four centuries or so, will continue to exist forever. If it can be conceived that the existing system of international politics will some day come to an end and the system of armament based on national territorial units will undergo a fundamental transformation, we should use our power to define and design the future in order to preempt such a future and to accelerate its attainment. Needless to say, we have the ability and responsibility not only to prevent the deterioration of the world from the present to the future; we also have the ability and responsibility to ensure, as soon as possible, that future generations will inherit a better world.

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1) The Asahi Shimbun, June 16, 1975, morning edition.
2) The New York Times, January 11, 1974.
3) See SIPRI Yearbook 1974 for the dollar price figures cited above.
4) China News Service, June 14, 1975.
5) Young, E.A.: Farewell to Arms Control, 1972, pp.49ff.
6) Kolkowicz, R., et al.: The Soviet Union and Arms Control, 1970, pp.14ff.
7) Singer, D.: Deterrence, Arms Control and Disarmament, 1962, p.167.
8) York, H.,"Deterrence by Means of Mass Destruction", Pacem in Terris Paper, 1973, quoted in SIPRI Yearbook 1974, pp. 58ff.

25th Pugwash Symposium
A New Design towards Complete Nuclear Disarmament
(the Social Function of Scientists and Engineers)
Kyoto, Japan, 28 August - 1 September, 1975

T. Toyoda (Japan)

XXV-17

DYNAMIC ASPECTS OF NUCLEAR DISARMAMENT

1. Fundamental attitude towards nuclear disarmament.

1.1. Essence of the Russell-Einstein Manifesto.

Nuclear disarmament is one of the most important world problems which should be solved for the survival of mankind, and we have been discussing the problem at various kinds of international meetings, including the Pugwash Conferences. However, no appreciable progress has been made so far, although several significant proposals for nuclear disarmament have been discussed from time to time in somewhat fragmented forms. As has been almost unexceptionally declared by national leaders and accepted by their peoples when they conducted their first nuclear weapon tests, nuclear armament has been regarded as one of the most effective means of assuring their security and even their national prestige. Thus, the arguments on nuclear weapon problems at the past international conferences could hardly be free from the national self-interest, in a classical sense, of nuclear weapon states.

Nuclear weapon systems which are brought about by modern technology give rise to a revival of old-time, say medieval, power politics, because extreme centralization of power in each nation states is needed for their effective functioning. On the other hand, due to remarkable progress in means of communication and transportation as well as considerable change in the internal structure of human societies, a new trend to re-examine the classical concept of the nation state has come about, at least in the technologically advanced countries. We believe it to be quite necessary for us to consider the nuclear disarmament problem not as a member of a nation state, but as a member of the human species. This is the essence of the Russell-Einstein Manifesto, issued twenty years ago. We Pugwashites should never forget it at any Pugwash meeting. (cf. Tomonaga's paper submitted to the present Symposium and also the Statement of the 1st Kyoto Conference of Scientists, attached to this paper.)

1.2. Mutual and individual responsibility.

As long as nation states continue to exist, it may not be so easy for a member of a nation state to give priority to loyalty to mankind over loyalty to his nation state. However, as concerns nuclear weapon problems, there is no dichotomy between national loyalty and loyalty to mankind, at least for those who agree with us on the proposition that the nuclear weapon is an absolute evil. (cf. Yukawa's paper submitted to the present Symposium.) Obviously, with respect to people of non-nuclear weapon states, there is no problem on this point. On the other

hand, if people of nuclear weapon states really want to achieve nuclear disarmament, they have to face their own governments, which are actively or passively escalating the spiral staircase of the nuclear arms race.

Although we do not like to use such ambiguous terms as "doves" and "hawks", it seems important to us to clarify the roles and responsibilities of "doves" in connection with the main theme of the present Symposium. So far, the importance of overall solidarity or world-wide unity of "doves" has been stressed. It is true that there exist certain differences with respect to having nuclear weapons among the present nuclear weapon states, and the "doves" of these states have been trying to talk together in order to avoid nuclear war. However, if we may dare to say it, they often overlook, consciously or unconsciously, the fundamental difference between nuclear weapon states and non-nuclear weapon states.

We may not be so surprised by the observation that past UN Disarmament Conferences have been terribly manipulated by the so-called nuclear superpowers. Disarmament may be more or less popular at conventional political conferences at the government level. We do not deny that nuclear disarmament will not be achieved unless the two nuclear superpowers start to undertake it; but this does not mean that they should be allowed to maintain a kind of hegemony at international conferences on nuclear disarmament.

In principle, one of the most important roles of the "doves" in nuclear weapon states is to urge their own governments to stop the development of nuclear weapon systems and then reduce them towards zero, while the "doves" in non-nuclear weapon states should persuade their own governments not to follow the path taken by nuclear weapon states as well as to encourage the "doves" in nuclear weapon states. It appears to be an irony of history that the inverse has frequently been observed in the international debates on nuclear weapon problems. Namely, many "doves" in nuclear weapon states have been eloquently speaking about how stupid and dangerous it is to have nuclear weapons to the "doves" in non-nuclear weapon states, and they have been warning of the dangers of so-called horizontal proliferation, while many "doves" in non-nuclear weapon states have been condemning the sabotage of the nuclear weapon states with respect to nuclear disarmament.

In the present paper we shall propose two separate symposia or conferences: one is a meeting of people from non-nuclear weapon states and the other of people from nuclear weapon states. This should not be misunderstood as a kind of dividing of the group of "doves". On the contrary, we believe this would be useful to establish and strengthen a real solidarity based on mutual responsibility of the world's "doves", instead of a superficial and ineffectual solidarity. Concerning nuclear weapon problems, ideological differences have become less important year by year, as the present political structure of the world clearly shows us. To live with nuclear weapons is the problem that mankind is forced to solve as quickly as possible.

In order to break through the present stagnation of nuclear disarmament, it seems quite necessary to avoid the tendency for non-nuclear weapon states to align themselves with either one or the other of the two nuclear superpowers. The real and mutual responsibility of "doves" solidarity must be based upon the firm conviction that the nuclear weapon is an absolute evil. This of course should be fundamentally reinforced by a consciousness of individual responsibility on the part of each "dove".

1.3. Dissimilarity between nuclear disarmament and arms control.

As clearly expressed in the title of the present Symposium, our primary concern is with nuclear disarmament, not with so-called arms control. Although the dissimilarity between nuclear disarmament and arms control is quite obvious, in connection with our fundamental attitude it seems worth while making the distinction clear. Indeed, there is a hidden, serious problem which is related to the so-called "realism" and "unrealism" of world peace.

Persons who are engaged in the more or less governmental work of arms control used to define it as a search for arrangements, explicit or implicit, to reduce the danger of nuclear war and provide security. In appearance this is a beautiful definition; but one of the most crucial points, that nuclear disarmament is absolutely necessary, is excluded from the definition. In fact, those who actively advocate arms control have implicitly made the premise that having or even developing nuclear weapon systems is allowed to the present nuclear weapon states, which sometimes call themselves the "responsible countries". Some of these so-called nuclear experts on arms control state openly that nuclear disarmament carries a connotation of unrealism.

However, if we are realistic enough, we cannot overlook the historic fact that the past negotiations and agreements on nuclear weapons, based upon arms control, have promoted the nuclear arms race between the two nuclear superpowers. Of course, because they seem to be reluctant to disclose the above-mentioned premise to the peoples of non-nuclear weapon states, they have been trying to combine arms control and nuclear disarmament in cosmetic or ceremonial ways.

The concept of arms control seems to stem from the doctrine of the status quo, or more explicitly of the "Pax Russo-Americana" by making use of nuclear weapons. We think it suffers from disregarding the future aspect of the changing world. The framework of nuclear arms control is the notion of nuclear deterrence, which will be discussed in the next section.

1.4. Remarks on minimum nuclear deterrence.

Needless to say, the concept of nuclear deterrence is based upon a balance of terror, and leads to the "ultimate absurdity". (cf Race to Oblivion -- A participant's View of the Arms Race. By Herbert York, Simon and Schuster, 1970.) The nuclear strategists in the nuclear

weapon states have coined several new terminologies. One of them is the term "minimum nuclear deterrence". This term is closely linked with a capability of "assured destruction". There is no doubt that the capability of assured destruction must change in accordance with the technological progress of nuclear weapon systems, so that it may only have some practical meaning provided the time of its application is fixed.

As Yukawa clearly pointed out in his paper submitted to this Symposium, a system of nuclear armament balance does not involve a built-in negative feed-back, but rather a strong positive feedback. It also quite clear that if for any political or psychological or technical reason, deterrence should fail, the physical, biological and social consequences would be completely out of line with any reasonable view of the national objectives of the USA or the USSR. (cf. York's paper presented at the Pacem in Terris Conference, held in Washington in 1973.) In such a case, not only the peoples of the two nuclear superpowers but all the other peoples on this planet would suffer catastrophic damage.

If we try to draw a tentative meaning from the concept of a minimum nuclear deterrence, it might be a paradigm for the first steps for slowing down the arms race. To quantify the minimum nuclear deterrence, one has to fix the time when it is undertaken. Those who would like to support the idea of minimum nuclear deterrence are obliged to show us precisely its quantitative and qualitative substance at the stage when they want to start nuclear disarmament, although this seems difficult due to the dead-heated nuclear arms race. In this sense, the discussions on minimum nuclear deterrence can have meaning only to a limited extent.

2. Fundamental principles of nuclear disarmament.

2.1. Power of public opinion.

As we described in the previous sections, nuclear disarmament will not be initiated by those who adopt the way of thinking based on the national interest of each nuclear weapon state. It may be of some interest that the size of intergovernmental discussions on nuclear disarmament has been reduced year by year, finally to the minimum number two, i.e. the SALT between the USA and the USSR. There can be very few intellectuals who really believe that the SALT has contributed to nuclear disarmament. On the contrary, we have heard many claims that it is a kind of collusion of the two superpowers, aimed at dominating the rest of the world with overwhelming nuclear weapon systems. For many years, we thought it would be effective at international conferences like Pugwash to talk with persons who were supposed to be influential in their governments. But we have observed that most of them were more likely to be influenced by their governments than to exert influence on governments.

Nuclear disarmament is certainly a most complicated problem, so that intellectual activities to solve the problem are keenly needed. We do not underestimate the role of mass movements against nuclear weapons, but regrettably some of them were organized primarily

for political or ideological purposes. This is, we think, far from the spirit of the Russell-Einstein Manifesto. Since world history is essentially influenced by people, including consciencious intellectuals, we should concentrate our efforts on the institutionalization of the power of public opinion, international and domestic, towards complete nuclear disarmament. The Pugwash Conferences and the Pugwash national groups should serve as good examples of such institutions.

2.2. Maximum common understanding among nuclear weapon states.

Despite some apparent variance in their motives and scales, the present nuclear weapon states have pursued almost similar patterns of nuclear development and nuclear strategy. This observation suggests to us that it would be useful to extract and rearrange the common understanding of all the present nuclear weapon states in order to formulate a procedure for nuclear disarmament. Thus, we would like to propose the holding of a conference or symposium where people of nuclear weapon states can meet together and discuss intensively the nature of nuclear weapon systems on a non-governmental level. One may call it a "nuclear weapon states conference". At the governmental level there now apparently exists a similar conference, i.e. the UN Security Council, whose permanent members are exclusively the nuclear weapon states. One of the most important differences between our proposed conference and the Security Council is that the former is free from the "veto" and is not a playground of power politics. We believe that the nuclear weapon state conference will be useful for providing confidence in the logical necessity for nuclear disarmament to the people of non-nuclear weapon states as well as to those of nuclear weapon states.

Indeed, it would be helpful in the drafting of an international agreement for nuclear disarmament if we could confirm what might be called the common understanding of the nuclear weapon states on the nature of nuclear weapon systems, as listed in the following:

a. No upper limit or saturation point exists for the technological aspects of the development of nuclear weapon systems.

b. Technological secrets on the making of Hiroshima type and Nagasaki type nuclear bombs no longer exist.

c. The number of nuclear power plants is increasing rapidly in the non-nuclear weapon states, and plutonium 239, which is necessarily produced by these power plants, is the main material of Nagasaki type bombs; its extraction is not very difficult.

d. Nuclear weapon systems are being automated more and more, and inevitably a nuclear war will proceed on prearranged programs functioning in a short time during which human judgement cannot be introduced.

e. The diversification and colossalization of sophisticated nuclear weapon systems are increasing the number, and scattering the locations, of weak points with respect to disturbance, whether intentional or unintentional.

f. The danger of the so-called "common mode failures" in the safeguarding of nuclear weapon systems is growing greater and greater.

g. The present situation of deployment and development of nuclear weapon systems is causing strains on the internal structures of many countries as well as on the international relationships among nation states.

Whether as objective facts or on the basis of experience, those concerned, in any nuclear weapon state, may have to accept the above whether they like it or not.

Unfortunately, decision makers of most nuclear weapon states seem to be reluctant to publicize explicitly such a "common understanding" as listed above. Thus, it is rather unlikely that the nuclear weapon states conference will be held by any government organization. Therefore, we believe that the non-governmental intellectual "doves" in the nuclear weapon states had better organize and manage it by themselves. Although it looks like a detour from our goal of complete nuclear disarmament, if they succeed in doing it, the educational effects on public opinion will be, we think, far reaching. To intensify public opinion favourable to nuclear disarmament in the nuclear weapon states must be one of the most crucial factors in order to achieve complete nuclear disarmament.

2.3. Minimum common wishes of non-nuclear weapon states.

The definition of a non-nuclear weapon state is quite obvious, but there are many differences -- political, economic, and social -- among non-nuclear weapon states. Accordingly, their concerns with nuclear weapon problmens seem to be quite diverse. For example, until a short while ago, most people of the so-called developing countries seemed to have felt apathy or even a kind of antagonism against disarmament in general. However, as the discussions at the recent Review Conference on the NPT showed us, the developing countries now have deep concerns with the behaviour of nuclear weapon states.

In the circumstances, we would like to propose the holding of a conference or symposium where people of non-nuclear weapon states meet together and discuss the problems of nuclear weapons on a non-governmental level. One may call it a "non-nuclear weapon state conference". We know that such a conference was held under the auspices of the UN, but it was awfully interfered with by the nuclear weapon states. To avoid the same failure, we had better start from a non-governmental conference or symposium.

The holding of a separate and parallel series of conferences of nuclear weapon states and non-nuclear weapon states is not in order to accelerate the confrontation between the two groups of nation states. On the contrary, the two conferences are complementary to each other with respect to our common aim, complete nuclear disarmament. If we indulge ourselves in technical or technological arguments about nuclear weapon systems only, people of non-nuclear weapon states , particularly of developing countries, may lose their interest in the discussions. The aim of the non-nuclear weapon states is to unite their / minimum common wishes with regard to peace problems in the nuclear age.

The urgent problem for non-nuclear weapon states is how to prevent bluff or menace

by nuclear weapons against non-nuclear weapon states. Therefore, possible agenda items for the conference may be as follows:

1. The proclamation of the "three non-nuclear principles" of not manufacturing, not possessing and not allowing to be brought in, nuclear weapons or parts of nuclear weapon systems.
2. A pledge or agreement that every nuclear weapon state will under no circumstances use any nuclear weapon against a country that has not deployed its own or foreign nuclear weapon system within its territory.

The above two items should be considered as a set, because they are intimately related to each other. Otherwise, some statesman in non-nuclear weapon states such as Japan may proclaim the three non-nuclear principles provided their countries are protected under the nuclear umbrella of a nuclear weapon state. This, of course, contradicts the wish that the nuclear weapon state would turn its policy from nuclear armament to nuclear disarmament. For detailed discussion of item 2, refer to Yamada's paper submitted to this Symposium. Although it was unfortunately not adopted at the final stage, a draft additional protocol III to the NPT, proposed at the recent Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, had a content similar to item 2. We think that a new trend towards promoting practical and effective measures towards nuclear disarmament has recently emerged from the non-nuclear weapon states.

The three non-nuclear principles were established as a national policy of the Japanese Government after deep reflection, and reaffirmed by the last Diet. However, we regret that our Government has not yet been able to abandon its policy of being under a nuclear umbrella, so that its proclamation of the three non-nuclear principles may not be quite persuasive to other countries in the present situation. On the other hand, we are afraid that some nationalistic leaders of non-nuclear weapon states are likely to be tempted to obtain nuclear weapons as long as nuclear weapon states are using them, explicitly or implicitly, for their political aims.

The common task of the "doves" in non-nuclear weapon states must be to watch that their own governments do not become armed with nuclear weapons, domestic or foreign, and to encourage the doves in nuclear weapon states to urge their own governments to initiate nuclear disarmament. To this end, a clarification of the common wishes of non-nuclear weapon states would be one of the most useful undertakings.

2.4. Urgency of interdisciplinary collaboration.

As the term "military-industrial complex" clearly shows, nuclear armament has been promoted and supported by the socio-economic structures of nuclear weapon states, although advanced nuclear weapon systems cannot be developed without the active participation of well-trained scientists and engineers. Ever since many eminent nuclear physicists warned against the danger of nuclear war and urged people to undertake nuclear disarmament, they have been appealing to all scientists of different branches, especially political scientists and economists,

to join this great undertaking. (cf. Statement of the First Kyoto Conference of Scientists.)

Speaking frankly, most active natural scientists, with a few exceptions, are amateurs in the political sciences and economics, so that intimate collaboration of natural scientists and qualified scientists in these fields are indispensable in order to study every aspect of nuclear disarmament. This must be a new type of collaboration, because each field of science seems to be confronted with serious difficulties its view of mankind's future. We are afraid that a conventional type of collaboration of scientists in different branches is apt to give rise to diversification of arguments and to prolong discussions on disarmament almost without limit.

For a real interdisciplinary collaboration on this problem, we should make every effort constantly to focus our concerns on it. In addition, we are convinced that a new value system should be introduced into the study of this problem and all the participants in this project should reaffirm their fundamental attitutdes towards this historic task. We are looking forward to hearing constructive comments on this point, rather then technical details of the nuclear arms race.

3. A grand design towards nuclear disarmament.

3.1. Pathology of nuclear disarmament.

Developing and manufacturing nuclear weapon systems are certainly modern technologies which are carried on for certain needs of nation states. One of the most important needs is stated as that of assuring the security of each nation state, although the implication of the words "security of a state" is ambiguous, especially in a nuclear age. At any rate, nuclear armaments have so far never reached a stable equilibrium and have proliferated both vertically and horizontally. Proliferation in its original meaning is an irreversible phenomenon.

Nuclear armament is indeed one of the fatal diseases of the present world. Therefore it seems quite necessary for us to analyse the pathology of nuclear armament as clearly as possible. One of the main motives for nuclear armaments is deeply based on the classical convictions of power politics. Namely, many people think that the security of a state can be attained permanently by military means. Such a thought is apt to lead to the adoption of a deterrence policy. However, as is explained also in other papers, the concept of nuclear deterrence has given rise to very serious problems which no-one anticipated before the advent of nuclear weapons.

Undoubtedly, without the financial support of a nation state, developing and manufacturing of nuclear weapons cannot be achieved. Thus the so-called military-industrial complex is closely related to this disease. Furthermore, in order to clarify sufficiently the pathology of nuclear armament, we cannot avoid examining the conventional notion of nation states in the light of the nuclear age. But we would like to put this task into the hands of political scientists.

Nuclear armament has a stronger tendency towards renewal than conventional armament, since it is easily guided by the doctrine of deterrence. In addition, it has not yet been outlawed in contemporary international society. As is well known, several therapeutic means of slowing down the nuclear arms race and preventing horizontal nuclear proliferation have been proposed; but none of them seem to have been successful. On the contrary, they are making the situation worse.and worse. This is, we think, due to the lack of understanding of the pathology of nuclear armament.

3.2. Dynamic structure of nuclear disarmament.

Logically, nuclear disarmament is a complete reversal of nuclear armament, but the former involves many irreversible processes. Therefore, we shall not be able to avoid a kind of friction in the process of nuclear disarmament. However, the basic framework of nuclear disarmament should have the following dynamic structure:

1st stage: a slowing down of the present nuclear arms race;

2nd stage: putting a stop to competition in the development of nuclear weapon systems;

3rd stage: bringing about the reduction and abolition of all nuclear weapon systems.

The reason why we present such a self-evident framework is that past proposals for nuclear disarmament and the arguments for them have been mixed up in order and category and deviate from our original aims. Nuclear disarmament should be designed as a system which contains effective measures at each stage and puts them into the most appropriate chronological pattern. Then, interrelations of these partial measures could be examined properly.

Here we would like to stress the importance of the time variable. Nuclear armament of nation states, particularly of the two superpowers, has been acquiring more and more momentum Evidently the more momentum it acquires, the more external energy is needed for deceleration. The momentum is of a socio-economic nature and produces a self-driving force. It may be very difficult to estimate precisely the duration of each stage mentioned above, because some measures may give rise to considerable impacts on the socio-economic structures of nuclear weapon states.

Already in 1962, the United Nations Secretary-General transmitted the report on 'Economic and Social Consequences of Disarmament', which comes to the conclusion that all the problems and difficulties of transition connected with disarmament could be met by appropriate national and international measures. We propose to re-examine this report and to reaffirm its conclusion in the context of the present world situation. If necessary, we should deepen the arguments and elaborate the details, specifically concerning nuclear disarmament at present.

In the dynamics of nuclear disarmament, the initial condition is important, so that we

should focus our arguments on the possible and appropriate measures for the first stage. The following items may be suggested:

1. (a) nuclear weapon states are to pledge that they will in no case launch a nuclear attack on a non-nuclear weapon state;

   (b) a moratorium will be announced on all nuclear weapon test explosions;

   (c) an international global system of physical inspection will be established.

These items are intended to prepare an appropriate political climate for multi-national agreements. With respect to items (a) and (b), no explanation is necessary. As to item (c), all the expenses to support it should be shared by the nuclear weapon states according to the size of their nuclear armament, which can fortunately not be hidden due to one of the most important political characteristics of nuclear weapons.

   (d) the total amount of the military budget will be reduced by a certain percentage, for example 25%, and this will be announced;

   (e) the staffs of military research agencies and institutes will be reduced, and this will be announced;

   (f) withdrawal of nuclear bases abroad.

With respect to items (d) and (e), if multi-national agreements are difficult to negotiate, even unilateral actions may be effective to demonstrate explicitly the intention of real nuclear disarmament

The above measures, proposed for the first stage, do not involve new and complicated technical problems, but are only reconfirmation of past proposals by several people including some Pugwashites. Among all nuclear weapon states, we believe the United States and the Soviet Union are particularly responsible for action in the first stage. We hope they may initiate these actions immediately instead of wasting time in such a negotiation as SALT. One should keep in mind that these measures must be considered in the perspective of the succeeding two stages.

For the second stage we may consider the following:

2. (a) nuclear weapon states are to declare that they will not be the first country to use nuclear weapons;

   (b) treaty form will be given to a total ban on nuclear weapon test explosions;

   (c) an international inspection system without infringement of national sovereignties will be established;

   (d) a further reduction in military budgets, and an equivalent amount to be donated to the so-called "fourth world" through the agency of the UN;

   (e) military research agencies will be completely disbanded, leaving only inspection officers and security personnel for the remaining nuclear weapon systems.

For the third stage, the following measures may be necessary:

3. (a) realization of methods of mutually confirming the abolition of nuclear weapon systems;

   (b) removal from weapons of nuclear explosives and transforming them into peaceful applications.

These are not new ideas. For example, Leo Szilard presented a penetrating insight into item (a), and the 7th Pugwash Conference had technically elaborate discussions on item (b), although the viewpoint was rather different from that of the present paper.

3.3. Technological feasibility of nuclear disarmament.

It may be worth while to point out that certain political and technological feasibilities have recently become known. As to the political feasibility, we would like to shift the discussion to other papers by political scientists. Here we shall argue on the feasibility brought about by the recent development of detection techniques.

Concerning surface detection, we may refer to the development of reconnaissance satelites and cruising vehicles equipped with devices which depend on the transmission and reception of laser beams and pattern recognition based on the built-in memory of a map. (cf. Tsipis's paper which appeared in a recent issue of the Bulletin of the Atomic Scientists.) On the other hand, as has been seriously discussed, networks of sonar-array-stations with a wave analysing centre could make the oceans transparent, although their deployment might be expensive.

Some nuclear strategists are worried about these technological developments, warning that if such powerful detection techniques were adopted, the present capability of a "second strike" might be radically spoiled and the military balance would be destroyed. From the point of view of nuclear deterrence, such a situation might be jeopardizing, because it would necessarily stimulate new developments aimed at an "assured destruction capability".

However, if these technologies were extensively developed and applied in a global system of detection, we could expect to remove one of the most difficult obstacles in the past negotiations on nuclear disarmament. The many reconniassance satelites of the United States and the Soviet Union now operating seem to a great extent to be easing mutual anxiety and suspicion about each other's deployment of nuclear missile bases. So-called "outer space" is indeed beyond any sovereignty.

We are now faced with a choice between two directions -- development of detection techniques for an international global system of inspection, or for more sophisticated vehicles for nuclear warheads. If we fail to make a wise choice, we may lose a very precious chance to initiate real nuclear disarmament and be led to the total destruction of mankind like a flock of sheep towards a slaughter house.

May 9, 1962

STATEMENT

All members of the human family, irrespective of country or creed, are today facing one great problem—the challenge of whether the human race shall continue to exist and prosper, or be destroyed by war. Since the advent of the atomic bomb, enormous strides have been made in the development of nuclear weapons and of means of delivery, with the result that today man is recognized to be capable of self-obliteration. Yet the arms race continues as before. Any answer to the problem must show mankind the way to survival instead of destruction. As is clear from the changes in world opinion, over the past few years more and more men and women have come to realize the terrible nature of the danger confronting humanity.

The Pugwash Conference of Scientists, which was originally inspired by the Russell-Einstein appeal, has consistently worked towards a solution of the problem in the eight meetings it has held since 1957. Scientists from many countries, including the United States and the Soviet Union, have attended each meeting on an individual basis. In the light of their common acceptance of the principle that 'the objective of avoiding total destruction must have priority over any other objective,' they have found it possible to conduct serious discussions, transcending national and ideological differences, and have reached agreement on many points.

The problem is so vast, however, that it must be considered from many angles. In addition to the international Pugwash Conferences, meetings and conferences with the same general objective should be held in every country.

As the country which has experienced the disastrous effects of nuclear weapons, and which has openly renounced war in its Constitution, Japan is in a position to make a special contribution to world peace. We are convinced that today, when the danger of the destruction of the human race by nuclear warfare is growing ever more serious, Article 9 of the Japanese Constitution* has a new significance, even greater than when the Constitution was first adopted. At the same time, we wish to emphasize once again our own responsibility for the maintenance of peace.

Accordingly, at the invitation of those Japanese scientists who have attended meetings of the Pugwash Conference, a number of us who are in sympathy with the spirit of the Russell-Einstein appeal have gathered in Kyoto to hold the first conference of Japanese scientists. After three days

of frank and earnest discussion, we find ourselves in agreement on the following points:

1. Science, by discovering the truths that lie concealed in the world in which we live, has made great contributions to the human race. Not all the technological developments deriving from science, however, can be regarded as beneficial to man. In order to ensure that the truths which science reveals are applied to the promotion of peace and the welfare of mankind, all men, including scientists, must strive constantly to prevent the misuse and abuse of the results of science.

2. That war can no longer settle international problems was affirmed in the joint US-Soviet statement issued last autumn in connection with the disarmament negotiations. Nevertheless, the view that the 'deterrent' effect of the continued possession of nuclear weapons helps to preserve peace is as firmly held and as vigorously expressed as ever. This view is exceedingly dangerous. As long as policies relying for the suppression of war on weapons of mass murder continue to be followed, the rival nations will inevitably do their utmost to hold on to the maximum power of retaliation, and in consequence their war potential will continue to grow. The result will be an increasingly unstable military situation, which in turn will increase the danger of war being started—leaving aside the possibility of an 'accidental' outbreak—through an incorrect appraisal of the situation, or through a mistaken judgment of the military strength of the enemy. The policy of depending on nuclear weapons for the prevention of war is in direct contradiction to our objective, the abolition of war. We are therefore compelled to oppose this policy.

3. Nuclear weapon tests produce large quantities of radioactive fall-out, causing somatic hazard and hereditary damage on mankind. For this reason alone, such tests should be prohibited; but no less important is the fact that the tests intensify the armaments race, thereby increasing still further the danger of war. It is admitted that the detection and identification of atmospheric and underwater tests present no great difficulties. In view of the physical damage these tests inflict on mankind, and of the marked influence they exert on the arms race, they should be banned forthwith. We demand further the early conclusion of a joint agreement by the nuclear powers to prohibit all nuclear weapon tests.

4. Even without recalling the resolution of the General Assembly of the United Nations which expressed their unanimous longing for general and complete disarmament under effective international control, it is obvious that the only true solution lies in general and complete disarmament, of which the first and preparatory stage must be a reduction in the nations' military establishment, including nuclear weapons.

We derive great hope from the 18-Nation Disarmament Committee now meeting in Geneva, at which numerous concrete plans have been advanced which appear to provide effective means of preventing war. Among them, we are most impressed by the proposals for the abolition of the means of delivery of nuclear weapons and for the withdrawal of military bases from foreign territory, both measures to be carried out at the earliest possible moment under the strict and effective international control.

5. We reject the view that disarmament is impracticable because it will adversely affect the economy of the disarming countries. On the contrary, we believe that the problem should be tackled positively and a new way to economic prosperity found.

In the report of the United Nations Secretary-General transmitting the study of his Consultative Group, 'Economic and Social Consequences of Disarmament,' it is concluded that all the problems and difficulties of transition connected with disarmament could be met by appropriate national and international measures. The raising of living standards in the newly developing countries, big public works for the utilization of natural resources, large-scale joint scientific research—all these and other similar projects could be undertaken with the resources made available by disarmament. There is no limit to the number of such constructive objectives. The prospect of higher standards and increased prosperity for the whole race, which disarmament can make possible, adds immeasurably to its significance.

Many problems, however, remain to be clarified, starting with the problem of what changes will have to be made in the structure of the world economy and in that of individual nations. In our own case, we believe a full study of the long-term effects of disarmament on the Japanese economy to be essential.

6. To put an end for ever to the age of wars and arms races, to achieve general and complete disarmament, and to build a new era of peace—these are the historic tasks to which humanity must devote itself today. Since politics, economics, science, philosophy and religion are all equally involved, men and women in all walks of life must share their knowledge and earnestly study every aspect of this great problem.

Confronted as we are by many pressing problems, our thinking must advance to a new dimension, transcending the current habit of looking upon national sovereignty as the highest of all values. As a step towards breaking down the narrow concept of national self-interest, which shows itself so clearly in the present nuclear arms race, the comprehensive discussion and study of a new legal order, and of the high moral ideal on which it must

be based, will be of greatest significance.

During our three days of frank discussion we have dealt with such subjects as 'Nuclear Weapons and Disarmament,' 'Disarmament and Economics,' 'Morality in the Scientific Age,' and 'The Japanese Constitution and World Peace.' We have decided that it will be useful to hold further conferences to be known as meetings of 'The Kyoto Conference of Scientists,' at which we shall go more deeply into all the related problems, including those left over from the present meeting.

Finally, we look forward to the liveliest comments on this statement of our views.

Kyoto, May 9th, 1962

EGAMI Fujio	FUKUSHIMA Yoichi
HIRATSUKA Raicho	KAWABATA Yasunari
KAYA Seiji	KIKUCHI Seishi
KUWABARA Takeo	MIMURA Yositaka
MIYAKE Yasuo	MIYASAWA Tosiyosi
NAMBARA Shigeru	OSARAGI Jiro
OUCHI Hyoe	SAKATA Shoichi
TAJIMA Eizo	TANAKA Shinjiro
TANIKAWA Tetsuzo	TOMONAGA Sin-itiro
TSURU Shigeto	WAGATSUMA Sakae
YUKAWA Hideki	

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* Chapter II. RENOUNCIATION OF WAR
Article 9.

Aspiring sincerely to an international peace based on justice and order, the Japanese people forever renounce war as a sovereign right of the nation and the threat or use of force as means of settling international disputes.

In order to accomplish the aim of the preceding paragraph, land, sea, and air forces, as well as other war potential, will never be maintained. The right of belligerency of the state will not be recognized.

25th Pugwash Symposium
A New Design towards Complete Nuclear Disarmament
(the Social Function of Scientists and Engineers)
Kyoto, Japan, 28 August - 1 September 1975

H. Seki (Japan)

XXV-22

THE METASTASIS OF NUCLEAR DETERRENCE
- THE CRISIS OF THE GLOBAL POLITY -

1. The dilemma of a security guarantee under nuclear deterrence.

The American Secretary of State for Defence, Schlesinger, has publicly declared the possibility of a first strike use of nuclear weapons. Since America has until now continuously rejected proposals for banning the use of nuclear weapons, this declaration may not perhaps be said to reveal any new policy. Yet the fact that the possibility of a first strike use of nuclear weapons was once again made quite clear, just after America had been defeated in the Indochina War, has revitalised the contradictions in a policy of security guarantee understood by deterrence strategy.

The American authorities later stated that a first strike use of nuclear weapons did not necessarily mean a pre-emptive attack. They employed an expression designed to tone down the first statement, but this may also be interpreted as a sounding-out of the Soviet Union for the sake of an agreement on an American-Soviet Regional Limited Nuclear War.

Yet what would happen if, for example, nuclear weapons were to be regionally employed in the Korean peninsula, in the way Secretary Schlesinger declared? Firstly, an American-Soviet nuclear contest within this limited region would hardly be surprising. That the nuclear countries must use nuclear weapons to guarantee the security of non-nuclear countries is due to the principle of a nuclear umbrella understood between them. The independent nuclear development of France took place because this did not in fact guarantee security, and there was a similar situation in the case of China.

In Japan, the government even now employs a conceptual method where it will have Japan protected by nuclear weapons in case of need, and will try to ask for a guarantee from America. If this were to be the case, it would not be strange for North Korea to request the same kind of guarantee from the Soviet Union. In any event, having yourself protected by a nuclear umbrella, which is a policy that relies on nuclear deterrent power, means that you are inevitably consenting to a nuclear contest between America and the Soviet Union. Even if such a contest began with tactical nuclear weapons, there could be no guarantee whatever that it would not escalate to a contest of strategic nuclear weapons. There would, furthermore, be no guarantee that a nuclear contest which was at first in a limited region would not escalate to other regions.

Under past nuclear strategy, there was already the danger of a nuclear war through madness or accident. The concepts and methods of so-called arms control were created in an attempt to apply this kind of restraint and safety argument to the danger of nuclear war from these two causes. This historical process was the undeniable truth of the arms race between America and the Soviet Union. The main point at issue is that nuclear deterrence strategy has to retain the intrinsic possibility of a first strike use of nuclear weapons, and it would not be incongruous to refer again to Schlesinger's statement. Neither would it be strange for nuclear war to take place on the occasion of an accidental armed clash. Hence, to the extent that the nuclear super-powers continuously adopt a nuclear deterrence strategy, the present world order has to contain the danger of a miscalculation, which will at some time or other have destructive consequences for the human race.

The fact that at present this danger cannot as a rule be discounted is the central question which the Pugwash Conferences must take up in a world shrouded by nuclear weapons.

2. The futile venture by the nuclear super-powers for a partial stabilization of nuclear deterrence.

Up to the present, a static model has been set up whereby the question was how nuclear deterrence between America and the Soviet Union might be stabilized. For strategists, this question required urgent resolution in strategic theory. However, we must try to re-investigate closely how a stable resolution might be achieved in reality, from a viewpoint which is in a higher dimension than that of the strategists. The problem should preferably be examined from the essence of dynamic deterrence, but let us first examine the thinking of the strategists.

Sophisticated strategists have argued that nuclear offensive capability can be divided into so-called first strike capability and second strike capability. According to this argument, first strike capability is targeted on the enemy's nuclear missile facilities but the second strike capability is targeted on the enemy's cities. It is said the strategy of second strike capability produces a more clearly stabilized equilibrium than the first strike capability, because the latter attempts to destroy the enemy's missiles. Fearing this, the enemy will also try to launch a pre-emptive attack, if it has a prospect of success. There is a mutual fear that if we do not pre-empt we will not remain alive. However, in the case of a second strike capability, the argument is that there is nothing to fear to the extent that there is a greement on both sides to target on the other's cities. There is certainly some reason in this seen from the logic of the strategists, as the specialst in game theory, Anatol Rappaport has shown:

> A first strike is useless unless it really is a first strike. Therefore contemplation of the use of first strike sets in motion a tendency to try to beat the other to the punch. The realization that the other is trying to do the same makes it imperative to use the first strike as soon as there is reasonable expectation of success. To procrastinate means to invite the other to strike first. Thus the very possession

of a first strike capability, or even a perceived attempt to achieve it, is an inducement to the other side to attack.

A second strike is directed against the country of the enemy at large, population, industry, etc. It does not impair the other's capacity to retaliate. Therefore to strike if one has only a second strike capability is suicidal. Presumably a 'national' power having only a second strike capability is deterred from attacking its rival. Seen in this way, a first strike capability appears as an agressive posture, and a second strike capability as a purely defensive one.

(Rappaport: Various Conceptions of War and their Consequences, Mimeo.)

Up to this point, Rappaport's argument is exactly the same as the logic of the strategists; however, he does not stop here but goes on to argue as follows, pursuing the logic of the strategists until it finally borders on madness.

Consider the 'protective measures' undertaken by the nuclear powers expecting a 'nuclear exchange', as the strategists euphemistically call the impending holocaust. A second strike strategy calls for the protection of the nuclear installations rather than of cities, because it is against the nuclear installations that a first strike is expected. A first strike strategy, on the other hand, calls for the protection of the cities, because it is against the cities that a retaliatory strike will be launchedif the first strike is not entirely successful. Consequently, measures taken to protect cities (civil defense etc.) appear to the other side as strong evidence that the enemy is contemplating a first strike. In other words, attempts to shield one's population from nuclear destruction, while they are rationalized at home as purely defensive measures (certainly bomb shelters do not have any offensive power), appear to the other side as a most serious threat.

Following the logic of their argument, the proponents of a second strike strategy ('the moderates') must press for leaving cities unprotected. Naturally such deliberate ommission of 'protective measures' seems to violate the first principles of 'national security'. This is hardly surprising in view of the fact that the entire logic of what has been called the 'delicate balance of terror' must appear insane to the outside observer. If the only justification of each nuclear arsenal is the existence of another nuclear arsenal, what possible justification can be offered for the existence of both nuclear arsenals?

(Rappaport, op. cit.)

In order to respond to a second strike capability, the necessity is created of gradually increasing actual nuclear capability. Yet if the cities are exposed to the other side undefended, the result is bizarre. The inhabitants of the cities are offered to the other side as so-called hostages and made the target of out-and-out genocide. When the most stable nuclear deterrence

system conceived of by strategists is considered as a dynamic model, it logically comes to rest at this point.

If strategists are sane, however, the next important question to be thrown at them will probably be that even if the inhabitants of the cities understand or deny such a situation, what in the world is the role of the strategists? It would not be surprising if the inhabitants of the cities were to collectively reject the role of the strategists. In such an event, what would happen if the strategists were to listen to the voices of the inhabitants and retarget on their opponents missiles? From then on, there would be the most unstable nuclear deterrence situation, with mutual antagonism due to first strike capability. The nuclear deterrence system attributable to the strategists has in the end to arrive at these contradictions, which will be nothing but the complete bankruptcy of nuclear strategy.

We have been arguing on the hypothesis that it is possible to distinguish between the so-called anti-cities strategy and the so-called anti-forces strategy. But to the extent that in reality both adopt a posture where confrontation is by nuclear weapons, there can be no possibility of gaining a concensus on this distinction. So-called minimum deterrence, where it is better to have at least a second strike capability against cities, cannot be accepted by even by strategists. It will on the contrary be stressed that minimum deterrence cannot provide a negotiating capability at times of crisis, and that the strategist-like response in the direction of the need for a first strike capability will once again raise its head.

(Morton A. Kaplan: Great Issues in International Politics.)

3. Arms control as a partial and temporary procedure.

A consultant to the American Arms Control and Disarmament Bureau, John Newhouse, has expressed a surprisingly optimistic view on the American-Soviet nuclear deterrence situation:

> There is at present a new and rather reassuring irony which is that the restraint coming from nuclear weapons is curbing the outbreak of conflicts, which would perhaps bring about a new world war if this kind of weapon did not exist. It is too late even for us to attempt to abandon these weapons. We must preferably move to link these weapons to a more stabilized political environment and equilibrium.

('The American-Soviet Detente and Arms Control'. Edited by the American Centre.)

When examined in terms of contemporary arms control, this sort of optimism is very difficult to support. The Soviet specialist, Marshal Shulman, who is a Professor at Columbia University, has criticized the structure of detente as follows:

> Some of the new technology now making its appearance has the effect of increasing the instability of the nuclear balance. The developments of the last few years in accuracy, in multiple warheads and in other areas have once again been causing anxieties about the possibility

of a first strike by either country against the other. Although it seems apparent that an effective disabling first strike is not a feasible action for either country, ambiguous actions on the part of either country give rise to these apprehensions and serve to stimulate military programs.

(Arms Control and Disarmament: An Academic View. The Annals of the American Academy of Political and Social Science, 1974.)

Shulman not only criticizes deterrence but further directs his attention to this kind of danger:

> We are in a period in which the prospect of the spread of nuclear weapons to other countries, and even to groups of people, is still a real possibility which, furthermore, has not been sufficiently addressed. We face the possibility of unauthorized use of weapons. We have to take account of the possibility that local conflicts may easily escalate into a general war, without either the United States or the Soviet Union wishing this to happen. (ibid.)

Arms control ultimately ventures, somehow or other, to prevent the overall destruction entailed in the torn fabric of nuclear deterrence strategy, which cannot finally avoid bankruptcy. This has already been indicated by many participants in this Symposium, beginning with Professor Toshiyuki Toyoda.

4. The nuclear arms race - the response of the super-powers to the loss of unconditional viability.

Kenneth E. Boulding has written that the advent of nuclear weapons brought about the loss of the unconditional viability of the classical state. In a sense, nuclear deterrence strategy was nothing more than an attempt to partially relieve that loss. Yet there are intrinsic contradictions in this strategy, stated previously, as was its clear bankruptcy. But the nuclear arms race still goes on, despite the fact that it rests on the illusion of the validity of deterrence strategy.

Even if in principle the loss of unconditional viability may be forecast, the expectation that it can be partially recovered by sovereign countries acting autonomously is the greatest stimulus to the nuclear arms race. If we look at the history of the nuclear arms race since the second world war, we can discover several discontinuous variations over the period of thirty years; these may be divided into three periods.

The first period, in general, was the era of American-Soviet monopoly of nuclear weapons. (Since the British development of nuclear weapons took place together with America, it is placed in the era of American-Soviet monopoly.) The second period was an era which showed the danger of so-called horizontal nuclear proliferation through the development of nuclear weapons by France and China. The third period was one which, because of the Indian nuclear test, came to apprehend the danger of nuclear proliferation to the third world.

The era of American-Soviet nuclear monopoly was marked by America's impatience

at always being pursued by Soviet nuclear developments, and may be further sub-divided into three. There was firstly a period in which the American mainland was a sanctuary, even against a Soviet nuclear attack, due to America's overwhelming nuclear capability. The next period was one in which, although America was clearly superior, the American mainland could be destroyed by a Soviet nuclear attack. In the final period, American-Soviet nuclear capability approached partity, which overlapped with the period that revealed the threat of the development of nuclear weapons by France and China. Or such parity could even be said to have come in the period where the danger of proli feration increased due to the Indian nuclear development.

At the second so-called Strategic Arms Limitation Talks (SALT) between America and the Soviet Union, a promise was made to mutually decide the maximum number of nuclear weapon systems. Yet the continuation of qualitative competition has been intense, such as in the increase of the direct hit accuracy of missiles, or in the development of Multiple Independently targetted Re-entry Vehicles (MIRV). Such competition has continued because under minimum deterrence there is no bargaining capability at a time of crisis, and there is also perhaps no actual second strike capability. Seen dynamically, there is a very strong fear of the other side making a technological breakthrough. Therefore, whilst America and the Soviet Union decided the quantitative maximum for the nuclear arms race, they still cannot help competing for qualitative superiority.

It is America who has usually taken the lead in the dynamics of the nuclear arms race. Why did America's nuclear strategy begin as a policy of containment of the Soviet Union? The experience of a Japanese surprise attack on Pearl Harbour was in some sense considerable for America, and it cannot be denied that this was one factor in making the American military open its eyes. Yet the fact that America took the lead in the post-war arms race meant that America's nuclear strategy became an information medium by which the mirror image of this strategy was transferred to the nuclear strategies of America's usual opponents: the Soviet Union, France and China.

This was a factor tending towards metastasis in the nuclear development and nuclear strategy of these countries. The relations are probably one kind of pathological mutual dependence learning, which is of course a relation of unimaginative imperfect learning. It is due to the restricted threat relations of nuclear strategy where nothing takes place beyond the metastasis of learning, the use of which word is premised on a strong value objective.

If a value objective is excluded from the conception of metastasis in nuclear deterrence, the term nuclear proliferation may of course suffice. Scientists have up to now emphasized the objective character of scientific knowledge, but if we move the focus of the problem to handling the pathology of recurrent and incomplete functioning of the system, it would be hardly strange if the concept of a value objective re-appeared.

The subject of pathology is the distinction between what is normal and what is abnormal,

which is quite simple if the cause of the disease is exogenetic. When, however, the cause of the disease is endogenetic this distinction is remarkably difficult. It is then that a concept designed to reveal a value objective becomes necessary.

For example, parasitic insects are normal as they are, but for the host, this is an abnormal situation which gives rise to illness. When changes are produced in the mechanism of cell increase, such as in cancerous cells, and information medium is created which internally tends to metastasis and produces the illness of an abnormal increase in cells. Seen from outside, the cells can scarcely be distinguished individually as normal, but as an information medium they are the basis for creating the metastasis mechanism. It is extremely problematic to exclude only the cancerous cells by selecting them from the normal cells, which are themselves difficult to distinguish. We can only say that treatment will be very difficult if only in that the cause of the disease is endogenetic. The same kind of difficulty in treatment will occur with the exogenic parasitic insect, the deeper the insect eats into the hosts cells.

The change in concept from one of external infection to one of internal metastasis is in a sense extremely important and symbolic. External infection is the movement of a living creature rather than information. Yet metastasis only needs the movement of information. The use of the concept of metastasis in nuclear deterrence is not just an analogy but is premised on an attempt to examine nuclear proliferation as an endogenic disease of global politics.

The concept of metastasis is operable in both the case of vertical nuclear proliferation of the so-called nuclear arms race and that of horizontal proliferation of an increase in nuclear countries.

5. The metastasis of limited nuclear strategy - horizontal nuclear proliferation.

The Soviet nuclear capability discontinuously increased with the compleion of the Soviet ICBM, and when the American mainland lost its invulnerability to Soviet nuclear attack, America produced the theory of Limited Nuclear War. This was a necessary consequence of the Dulles' doctrine of massive retaliation. When the Soviet Union brought nuclear missiles into Cuba in 1962, American decision makers receives a great shock, which resulted in the decisions of the Cuban crisis. Yet from the Soviet standpoint, this was nothing beyond the attempt to produce symmetrically for America the crisis situation which had always existed for the Soviet Union in the 1950s. Since the capability to destroy the large cities of the American mainland increased when the Soviet Union brought nuclear missiles into Cuba, America had also to re-investigate its asymmetrical strategy towards the Soviet Union. Such thinking was quite natural for the Soviet Union, and we may clearly see here the process tending towards metastasis in which the key to nuclear deterrence was transferred.

On the other hand, as American and Soviet nuclear parity came closer, the importance of war-means below this level, such as conventional weapons, has once more risen to the surface

in the thinking of strategists. After the Cuban crisis, the so-called flexible response strategy was produced, where the American forces decided they would respond as they could within a certain spectrum of conflict. Because of this, the American military budget hypertrophied extraordinarily and the strategy was submitted to experiment in the Vietnam War. In this strategy, the level of escalation is fixed and, according to the scale of the other side's response our side responds with a higher scale. If all does not go well, escalation continues. Yet as America increased the levels of escalation, it had to consider the situation in which China had succeeded in developing nuclear weapons.

When the level of escalation was raised, America had no intention of attacking China, but a message was sent that if China became engaged it would be subject to a nuclear attack. In the end, China did not participate in the Vietnam war, preferring to activate the Great Cultural Revolution. As a result, a war between China and America due to a miscalculation was to some extent avoided, but it is a fact that a great danger of nuclear war due to a miscalculation existed in the second half of the 1960s. The Chinese side even tried to build a war capability against America by digging underground trenches and activiating the Great Cultural Revolution. During this period, there was also a fear that the Soviet Union, under a secret agreement with America might make inroads into China by a method like that appropriate to the partition of Poland. This was the most important factor in the worsening of Chinese-Soviet relations during the latter half of the 1960s. Here was another case where the specific configuration of American nuclear weapons towards China and the Soviet Union tended to metastabilize deterrence.

There was always a minority hawk faction in America which had advocated a pre-emptive nuclear strike from the inception of nuclear development: that is, a preventive war against the Soviet Union and China respectively. In reality, however, preventive war was not agreed on and the contention of the dove faction ultimately prevailed. Notwithstanding this, we should not ignore the fact that a miscalculation might have taken place in the course of events, and it was in a sense fortunate that this did not take place. In fact, even now there is a possibility of a nuclear war due to a miscalculation. The clock on the cover of the Bulletin of the Atomic Scientists shows the danger that an all-out nuclear war will occur at midnight. At the time of the Cuban crisis, the clock came to one minute before midnight, and at the time of the third Middle East war, it came to nine minutes before midnight. The danger still remains of an all-out nuclear war between America and the Soviet Union and, moreover, there is a tendency for this danger to increase.

6. <u>The collapse of the flexible response strategy and the disarray in American strategy towards the third world.</u>

America has recently manifested an unbending nuclear strategy towards the countries of the third world. The posture towards these countries, including the Korean Peninsula, is nothing but one which says 'we will actually use nuclear weapons'. As a result of America's defeat in the Vietnam War, she became aware that the flexible response strategy did not work well. It only

remained to try to break loose from the danger of nuclear war by firstly requesting the transfer of conventional war potential to Allied countries, and secondly leaving to them that part of conventional military power which had gradually become important in the so-called flexible response strategy. At the same time, America selected important countries, only on a regional basis, and drew up a scheme of short-term strategic war which was made possible by the American forces' talent for automated military technology. It is unquestionable that this scheme is behind the recent thinking of American strategists.

If land forces are dispatched, as during the Vietnam war in the 1960s, the domestic anti-war movement will strengthen and the policy will not go well. A method which does without the dispatch of land forces is a strategy which mingles threats and actual operation of tactical nuclear weapons with air bombardments which accompany the dispatch of armed forces by large air transports An attempt at large scale bombing under this formula had already been experimented with by the end of the Vietnam War. It may be said that such a formula will take root in future American strategy.

If the declaration of the use of tactical nuclear weapons towards the third world develops into an actual nuclear deterrence situation, it is clear that this will trigger a metastatic process within the third world. India has carried out a nuclear test, ostensibly 'for peaceful purposes'. But India's reason for this is that because America and the Soviet Union have nuclear weapons, and because America is in reality conducting diplomacy by nuclear threats, it is natural that India too should develop nuclear weapons. Consequently, India counteracts criticisms of her nuclear development from countries who, like Japan, consider themsemves as protected by the American nuclear umbrella with this sort of logic. This may also be ironic proof of the bankruptcy of nuclear deterrence strategy on a global scale.

Because of this strategy, America still ranks first in military aid and weapons exports to the third world. The Soviet Union and France respectively are second and third, and the Soviet Union in particular is catching up with America. Here too American behaviour is serving as an information medium for pathological learning by the Soviet Union and France. The process by which the nationalism of the third world is involved in the world political system in the form of military nationalism gives no grounds for discounting the existence of pathological symptoms on a global scale.

7. <u>The limits of arms control in a period of nuclear guerilla war - the last stage of metastasis of nuclear deterrence theory.</u>

It is not as if there has been no attempt to even partially reduce the world danger of nuclear deterrence.The reason why the results of peace research were applicable can be found in the taking hold of arms control, even in the domain of those partial measures.

The first ventures of arms control were the conclusion of a Partial Nuclear Test-ban

Treaty and the establishment of the American-Soviet hot line immediately after the Cuban crisis. The former was brought about as a result of many ordinary citizens becoming conscious of the harmful effects to human beings of the radioactivity from nuclear tests. The latter is intimately connected with communications theory in peace research.

The conclusion of the American-Soviet Nuclear Non-Proliferation Treaty is closely related to the fact that each country could follow the other's nuclear development from research on observations on nuclear tests. Yet this treaty was concluded with the intention of putting a stop to the possession of nuclear weapons by other countries. The nuclear countries retained their right to decide to increase their autonomous nuclear capability and this is the decisive weakness of such agreements.

In 1973, America and the Soviet Union concluded an agreement to prevent nuclear war and promised not to engage in nuclear war between themselves. Yet when we consider that nuclear deterrence strategy is premised on the use of nuclear weapons, this compact in factcreated the danger that a limited nuclear war would be more likely to occur in the area comprised by the American and Soviet mainlands. Thus even if there was a no-war compact for example, once nuclear weapons were used, the danger of a miscalculation will have increased extraordinarily.

As was stated previously, if the logic of the strategists is pressed to its conclusion, stabilized nuclear deterrence between America and the Soviet Union is a policy which offers the cities to the other side as an absolute hostage. This strategy is, in other words, equivalent to a policy of hijacking 'Spaceship Earth'. What in the world is a policy which agrees to the other side hijacking our own people as hostages? Even if America and the Soviet Union reach absolute agreement and the two hijacking groups amalgamate, the rest of the people living on the earth will probably be needed as hostages. Americans have recently come to like using the concept 'Spaceship Earth'. The fact that the strengthening mutual independence of the human race on that earth is seized by the concept is also remarkably symbolic. Is it not a very shocking expression at a time when the American-Soviet deterrence strategy is hijacking that self-same 'Spaceship Earth'? America in particular first developed nuclear weapons and first produced the thinking behind nuclear deterrence. America then demanded that the human race believe in nuclear deterrence. Yet if we are to be threatened by nuclear deterrence, it would hardly be surprising if we too were to develop nuclear weapons. When China developed nuclear weapons, it declared that if all countries developed nuclear weapons, it would be possible to abandon them. Moreover, even the hikacking of aircraft by Arab guerillas is nothing but an action which transfers the key to American nuclear deterrence strategy to other hands. Can we consider any other path towards extricating ourselves from the crisis of contemporary civilization - the crisis of a nuclear genocide of all the inhabitants of the earth - other than the extinction of the nuclear hijacking

system? Can we not conclude that the first premise for safely landing the 'Spaceship Earth' which is beneath this system, is that it is recognized by all the inhabitants of the earth?

The atomic experience of Hiroshima and Nagasaki in Japan may well become the breakthrough in forcing a change in the cancerous and metastatic hijacking philosophy. The atomic experience of Hiroshima and Nagasaki must not become the source of an allergy; it must preferably have meaning as an immunizing injection which can cure the symptoms of metastatic nuclear deterrence. Even if this is not accepted by the policy-makers who represent the gathering of national interests, a viewpoint proper to long term peace certainly exists on this earth. The atomic experience of Hiroshima and Nagasaki is truly such a representative example of the viewpoint which anticipates a value system of global peace in the era of 'Spaceship Earth'.