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Evolution of the US-USSR Draft Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques: New International Environmental Law

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EVOLUTION OF THE US-USSR DRAFT
CONVENTION ON THE PROHIBITION OF MILITARY
OR ANY OTHER HOSTILE USE OF ENVIRONMENTAL
MODIFICATION TECHNIQUES:
NEW INTERNATIONAL ENVIRONMENTAL LAW

HOWARD L. APRIL

This paper is submitted in partial fulfillment of the requirements for the Master of Marine Affairs Program, University of Rhode Island. The views contained herein are solely those of the author.

April 1, 1976

MASTER OF MARINE AFFAIRS
UNIV. OF RHODE ISLAND

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INTRODUCTION

One cannot pick up a newspaper or newsmagazine at this time in early 1976 without reading about possible threats to the environment such as Concorde SST's potential impact on the ozone layer or the possibility that the fluorocarbon propellants in aerosol cans will deplete the ozone layer. In February 1976, Secretary of Transportation Coleman¹ in announcing his decision to permit the Concorde to land at Dulles Airport outside of Washington, D.C. and at JFK Airport in New York considered that the impact of the 16 months of test flights on the stratosphere would be miniscule and the speculation of a slight risk of increased cancer cases did not justify his withholding approval for the Concorde landing rights.

Russell E. Train², Administrator of the Environmental Protection Agency, in October 1975, considered fluorocarbons as possibly the first truly global environmental problem and called for some kind of international mechanism to deal with the chemicals.

A. U.S. Coast Guard scientist C. R. Weir³ reported to the annual meeting of the American Geophysical Union on December 9, 1975, that oil spills in the Arctic could conceivably melt the ocean ice, and thus affect the earth's climate.

Bombarded by these reports in the media, one may wonder what laws there are to prevent such potentially

damaging modification of the environment. The more sophisticated may ask what treaties exist on the subject of environmental modification and pollution, what the U.N. is doing about these potential dangers, or who is liable for damages.

One could not feel complacent from the answers to these questions, but the situation is not all bad. Some progress is being made at the international level. There are some conventions already in force and more waiting for the requisite number of ratifications, which may never be achieved. Provisions of some of the conventions prove more illusory than real, because in general these international agreements lack the means of enforcement and depend on voluntary compliance and the goodwill of nations, a rare commodity when national interests are threatened. Some are in the process of negotiation - the most important being those conventions under consideration by the Law of the Sea Conference scheduled to reconvene in the spring of 1976 in New York. A landmark convention to ban the hostile use of environmental modification has been proposed by the United States and the Soviet Union, and it is this proposal which I will treat in depth in this paper. I will trace its evolution from Senator Claiborne Pell's proposal in the U.S. Senate in 1972, following disclosure of U.S. military rain making activities in Viet Nam⁴, to the February 1976 continuation of discussions on the U.S. - U.S.S.R. Draft Convention by the Conference of the Committee on Disarmament (CCD). As background

and to appreciate how far we have come in international environmental law and its unfortunate corollary how far we still must go, I will examine some of the relevant legal decisions and international actions beginning with the historic Trail Smelter decision in 1941.

I will conclude with recommendations designed to forestall or at least to diminish somewhat the likelihood of harmful environmental modification.

II. EVOLUTION OF A CONVENTION

A. U.S. Senate Resolution on Environmental Warfare⁵

Senator Claiborne Pell (Rhode Island) introduced a resolution in the Senate in 1972 calling for a treaty to ban environmental warfare. It failed passage in 1972, but was adopted by a wide margin (82-10) on 11 July 1973 as Senate Resolution 71.

Resolution 71 expressed the sense of the Senate that the United States should seek an agreement with other countries, including all Permanent Members of the U.N. Security Council, on a treaty to halt all research, experimentation and use of environmental modification techniques as weapons of warfare. The Resolution also contained a model treaty, which barred weather, climate, earthquake and ocean-modification techniques, if used for warfare.

B. The Nixon-Brezhnev Summit in 1974

The Joint Communiqué⁶ signed by President Nixon and General Secretary Brezhnev at the close of President Nixon's visit to the Soviet Union in the summer of 1974, contained a brief reference to a Joint Statement advocating effective measures to stem the dangers of the military use of environmental modification practices. The Joint Statement⁷ recognized that the military use of such environmental modification techniques "could have widespread, longlasting, and severe effects harmful to human welfare," and proposed bilateral U.S.-Soviet talks to explore the problem.

To put it into proper perspective, the reference to environmental modification was overshadowed by such weighty issues as strategic arms limitation, ABM systems, underground nuclear weapons tests, agreements on economic cooperation, energy, housing, artificial heart research, not to mention Europe, the Middle East and Indochina.

C. Soviet U.N. Proposal on Environmental Modification

Normally bilateral discussions would be held as proposed in the Joint Statement at the Summit, before any outside action was taken on the subject by either participant. However, before the first U.S. - U.S.S.R. bilateral meeting could take place, the Soviet Foreign Minister⁸ proposed in a letter to the Secretary General dated 7 August 1974 that a new item be added to the 29th General Assembly's Agenda entitled "Prohibition of action to influence the environment and climate for military and other purposes incompatible with the maintenance of international security, human well-being and health." The Soviets apparently decided to use this subject as their so-called annual disarmament resolution⁹ at the U.N. On 21 September, the General Assembly¹⁰ added the item to its Agenda and on 24 September the U.S.S.R.¹¹ submitted a draft resolution with a draft convention attached. With slight modification, the resolution was cosponsored by 23 other members.

The resolution¹² considered "it necessary to adopt, through the conclusion of an appropriate international convention, effective measures to prohibit action to influence the environment and climate for military and other hostile purposes, which are incompatible with the maintenance of international security, human well-being and health." The resolution would send the draft convention to the conference of the Committee on Disarmament to achieve agreement on a text for consideration by the Thirtieth Session of the General Assembly (UNGA) in 1975.

On October 21, Soviet Ambassador Jacob A. Malik¹³ introduced the resolution in the First Committee of the UNGA by declaring that scientists had concluded that weather warfare could:

- create windows in the ozone layer of the stratosphere letting deadly radiation fall on selected areas;

- detonate nuclear explosions in the Arctic or Antarctic icecaps, starting ice slides followed by disastrous tidal waves wiping out whole areas;

- form tidal waves by dropping blocks of the continental shelf into deeper parts of the ocean;

- form acoustic fields on the ocean surface to combat enemy flotillas.

U.S. Ambassador Martin¹⁴ in his statement before the Committee on 30 October pointed out that environmental modification techniques though largely hypothetical, have the potential for hostile as well as peaceful purposes. He went on to state that

the United States would not use climate modification for hostile purposes if these techniques were perfected in the future.

D. U.N. Passes Soviet Environmental Modification Resolution by Overwhelming Margin

In the First Committee voting on 22 November the resolution passed by a vote of 102 (UK, USSR) to 0, with 7 abstentions (France, U.S.A.), Ambassador Martin explained the United States abstention stating that the resolution prejudged significant areas and that it was not clear that a convention was possible or would be effective. The General Assembly passed the resolution as 3264 (XXX) on 9 December by a vote of 126 (UK, USSR) to 0, with five abstentions (France, U.S.), with China not taking part in the voting.

E. The Soviet Draft Convention on the Prohibition of Action to Influence the Environment and Climate for Military and Other Purposes Incompatible with the Maintenance of International Security, Human Well-Being and Health.¹⁶

The Soviet Convention would bar the use of scientific and technological means to influence the environment for military and other purposes incompatible with international security, human well-being and health. A list of banned activities was

included. Complaints against violators of the convention would be lodged with the U.N. Security Council.

The Preamble states the justification for the convention. It opens with an interest to limit the arms race and bring about disarmament. The second paragraph expresses the possibility that advances in science and technology may be used for military as well as peaceful purposes. Its third paragraph raises the possibility that attempts to affect the environment for military purposes may represent exceptional danger to peace and human well-being. The fourth preambular paragraph expresses the strong interests of states in preserving and improving the environment.

Article I bans the use of scientific or technological means to change the environment for military or other purposes incompatible with human well-being.

Article II contains the following list of activities, referred to in Article I, affecting the land, seabed, ocean floor, marine environment, deep earth, atmosphere and the rest of the environment:

- (a) Rainmaking
- (b) Weather, climate and land water modification
- (c) Modification of electrical processes in the atmosphere
- (d) Any disturbance of the energy or water balance of meteorological systems such as cyclones or frontal systems
- (e) Altering the physical and chemical characteristics of

the oceans, seashore and seabed resulting in changes to the hydrological system and ecology of the oceans' biological resources

- (f) Stimulating earthquakes and such phenomena as destructive ocean waves, including tsunamis
- (g) Alteration of the air-water interface
- (h) Forming continuous electromagnetic and acoustic fields in the oceans
- (i) Changing rivers, lakes and other land water systems causing drying up, flooding, etc.
- (j) Disturbing the land surface causing erosion, interference with irrigation, etc.
- (k) Burning of vegetation affecting the ecology of the plant and animal kingdom
- (l) Disturbing the ionosphere, ozone layer or any elements of the earth-atmosphere - sun system.

The above list could be amended depending on progress in scientific research.

Article III bars assistance to other states or international organizations, and Article IV calls for the enactment of domestic legislation to implement the Convention "anywhere whatsoever within its jurisdiction or under its control."

Article V provides that the Convention shall not impede the parties' economic, scientific or technological development, or international cooperation in utilizing the environment.

Articles VI and VII provide for complaints to the Security Council for violations of the Convention and assistance to injured States when the Security Council decides that such injury has taken place.

Article VIII provides an amendment procedure by majority vote including depository Governments, and entry into force for a state dependent upon its acceptance of the amendment.

Article IX provides for reopening the Convention after five years or sooner by majority vote.

Article X provides for withdrawal with three months notice under exceptional circumstances.

Article XI contains the rules for entry into force, signature, accession, depository States, etc. The number of ratifications required for entry into force is not specified, but the depository Governments must be among them. Article XII provides for signature.

F. An Analysis of the Soviet Proposal

The Soviet proposal does not contain the reference to "widespread, longlasting, and severe effects" contained in the 1974 Nixon-Brezhnev Summit Statement. The Soviet text instead employs the criterion of incompatibility with human well-being without any qualifiers, which is an open invitation to ambiguous interpretation. It should be noted that the above Nixon-Brezhnev qualifier contains the connective "and", indicating that all three may have to be present. Widespread effects alone might not be covered.

Upon first reading the Soviet proposal, I sought to determine whether it would apply to the widely discussed diversion to the South of the northward flowing rivers in Siberia.¹⁷ Article II (i) is the relevant one, but its application in the diversion of Siberian rivers would only be covered by the catchall phrase "or having other harmful consequences", and such consequences would be difficult to prove in the short run.

The possible danger to the stratosphere and its ozone layer by the SST presumably would be covered by Article II (1). However, Article V negates the application of Article II by assigning a higher priority to a State's economic or scientific and technological development. Such development whether apparent or real might be used as a rationale for undertaking any of the activities banned under Article II. It is interesting to note that this restrictive clause which would not necessarily command universal acceptance, is combined in the same sentence in Article V with the universally accepted support for international cooperation in using and improving the environment for peaceful purposes.

Article IV would require a State to prevent violations of the Convention anywhere under its jurisdiction or control. The latter would apply to flag state enforcement in areas where res nullius or res communis apply, e.g. the high seas or deep seabed. These areas may be more specifically defined by a successful U.N. Law of the Sea Conference in the Spring of 1976.

The hearing of disputes by the Security Council with its

big-power veto and its highly political nature does not seem to me to be the best choice for dispute settlement in the environmental field.

The enforcement procedures and other aspects of the Convention are similar to the Seabed Arms Control Treaty.¹⁸

In an editorial comment, the Journal of Environmental Policy and Law felt that acceptance of such a convention by the major powers would be a useful step in limiting the techniques of technological warfare, and would complement other SALT talk steps to reduce nuclear arsenals, in addition to existing conventions on chemical and biological warfare. The Journal²⁰ went on to note that the United States in January 1975 at last ratified the 1925 Geneva Protocol against chemical and bacteriological weapons, but with reservations concerning the use of riot control agents. It also considered as significant that there were 110 signatures and 38 ratifications for the "more radical" Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction. The Journal²¹ concluded that by implementation of this Convention which went into effect with the ratification by the UK, USSR and US on 26 March 1975, a potential for environmental catastrophe could be avoided.

G. U.S. - U.S.S.R. Bilateral Discussions

The United States and the Soviet Union held three bilateral meetings in the period Nov. 1, 1974 to June 20, 1975 in Washington and Moscow on an environmental modification treaty pursuant to the July 3, 1974 Joint Statement. The U.S. Delegations were chaired by Admiral Thomas D. Davies, Assistant Director of the U.S. Arms Control and Disarmament Agency (ACDA) and head of its Nuclear Weapons and Advanced Technology Bureau. The Soviet Delegations were led by Academician E. K. Fedorov, formerly Director of the Soviet Hydrometeorological Service. Formal agreements resulting from these meetings were not publicized. However, the presentation to the Conference of the Committee on Disarmament on 21 August 1975 of identical draft conventions by the U.S. and USSR Delegations speaks for the results of the bilateral meetings.

The Conference of the Committee on Disarmament (CCD)²²

In 1961 the U.N. General Assembly unanimously welcomed a joint U.S. - U.S.S.R. statement of principles as a basis for moving toward complete disarmament. At the same time it adopted a resolution endorsing a U.S. - U.S.S.R. agreement to establish an Eighteen Nation Disarmament Committee including the UK, US, USSR and France. The Committee began its meetings in Geneva in 1962 without French participation. The Committee was enlarged by eight in 1969 and

its name changed to Conference of the Committee on Disarmament. Five more members were added in 1975 for a total of 31 with France still not attending. The Committee over the years has given special attention to such questions as general and complete disarmament, the prohibition of the emplacement of nuclear weapons and other weapons of mass destruction on the seabed and ocean floor, the elimination of chemical and biological weapons, a comprehensive test ban and non-proliferation of nuclear weapons. The CCD reports annually to the General Assembly and the Disarmament Commission. The Disarmament Commission was established under the Security Council in 1952.

H. The CCD Considers Possible Prohibition of Hostile Use of Environmental Modification²³

At the suggestion of Sweden, the Committee held four informal meetings with experts of the U.S., U.S.S.R. and others in the period 4 - 8 August 1975 to achieve a better grasp of the unfamiliar subject of scientific research in the field of environmental modification. Observers from the World Meteorological Organization and the United Nations Environmental Program also participated.

Almost all delegations made statements supporting the desirability of taking action to prohibit environmental modification for military or other hostile purposes. On 21 August 1975, the U.S. and U.S.S.R. submitted identical draft conventions on the subject.

J. An Analysis of the U.S. - Soviet Draft
Convention on the Prohibition of Military
or Any Other Hostile Use of Environmental
Modification Techniques²⁴

The first obvious difference between this Convention and the earlier Soviet Draft is the title which was changed from a ban on activities incompatible with human welfare and health to a ban on hostile uses of environmental modification. The use of a criterion of incompatibility would be so general and could be interpreted so broadly as to defy application; whereas the use of the term hostile introduces the more limited and more manageable concept of unfriendliness along with a connotation of intent.

The preambular paragraphs set out the purposes and rationale for the Convention in a more positive manner than the earlier Soviet draft, and provide a more balanced statement of the potential for good as well as for harm that may be forthcoming from the application of environmental modification techniques. The preamble also clearly indicates that this is a disarmament type convention banning certain military, hostile and warfare techniques, and speaks to "widespread, long-lasting or severe effects." These three conditions are derived from the Nixon - Brezhnev Summit joint statement, but here any one would be sufficient; whereas all three would have had to be met in the Summit phrasing employing "and" instead of "or."

Article I calls upon each contracting State to avoid military or other hostile use of environmental modification techniques with widespread, long-lasting or severe effects, and furthermore to avoid assisting others in these pursuits.

Rather than including a long list of fairly specific banned activities as was the case in the Soviet draft, Article II defines "environmental modification techniques" referred to in Article I, as any technique changing by deliberate means the dynamics, composition or structure of the earth, its waters, the atmosphere or outer space, causing such phenomena as earthquakes, tsunamis, ecological changes or changes in weather patterns, the ozone layer, ionosphere, climate or ocean currents.

Article III exempts from this Convention environmental modification for peaceful purposes. Article IV requires each contracting State to take the necessary measures to prevent violations anywhere under its jurisdiction or control. Article IV could leave large areas of the oceans beyond the application of the provisions of this Convention, but this might be corrected by action taken at the U.N. Law of the Sea Conference.

Article V provides for consultation and cooperation among contracting States within or without the U.N. System, and also provides for the lodging of complaints with the Security Council. However, States already have this opportunity under the U.N. Charter, Articles 33 - 38. Each contracting State also undertakes to assist harmed or likely to be harmed parties so designated by the Security Council.

The amendment procedure in Article VI is poorly defined, but in any case, the amendment only enters into force for a State when accepted by it.

Under Article VII the Convention is of unlimited duration and there is no easy withdrawal clause, which was a defect in the original Soviet draft.

The procedures for signature, ratification, entry into force and registration are covered in article VIII, but the number of ratifications necessary for entry into force are not given.

K. Settlement of Disputes

(1) The Security Council

A crucial element of this US/USSR Draft Convention is the means of settling disputes. Article V paragraph 1 allows bilateral consultations to solve problems and also provides on a purely voluntary basis the various international procedures which can be found enumerated in Article 33 of the U.N. Charter,²⁵ such as mediation, conciliation, arbitration, etc. Paragraph 2 of the same Article provides recourse to The Security Council. As pointed out earlier, the disadvantages of the Security Council are its highly political nature and the existence there of the big-power veto. It has not traditionally dealt with problems with a predominantly scientific or technological component such as would be encountered in the application of this Convention.

Its advantages are that it is an existing UN body, it functions continuously and it is readily accessible to States. In fact, as stated earlier, States can bring environmental modification warfare questions before the Security Council under the UN Charter.

(2) Obligation to Resort to Procedures Entailing a Binding Decision

Two options in dispute settlement: i.e. voluntary resort to settlement and obligation to resort only to non-binding procedures, are definitely less desirable than the provisions in the present Draft, and will not be considered further in this paper.

Clearly the desired means of dispute settlement would be an obligation to resort to a settlement procedure resulting in binding decisions either in the interpretation of the convention or in its application. The three principal alternatives would be arbitration, a special Tribunal and the International Court of Justice.

a. Arbitration

Professor Sohn²⁶ in his excellent and comprehensive study of dispute settlement in connection with the Law of the Sea, found that arbitration offered the most flexibility and permits a choice of membership on an arbitration Tribunal to be tailored to the problem. However, States have not generally accepted foolproof arbitration procedures. The tribunals have encountered

membership and procedure problems which have limited their usefulness, and they cannot deal with emergency situations requiring immediate action.

b. International Court of Justice

Sohn²⁷ found that the International Court of Justice is able to take provisional action to protect the rights of all concerned and in general can react as quickly as the parties wish. Other advantages are its long experience in dealing with international agreements and its ability under the Statute to form chambers to deal with particular categories of cases.

In considering the use of the I.C.J., one must not overlook the history of the Court since its formation. Two factors need to be considered. First is the acceptance by States of the "Optional Clause", and second their appearances before the Court.²⁸ All members of the United Nations are automatically parties to the Statute of the I.C.J. by virtue of Article 93 of the U.N. Charter. However, very few States have accepted the compulsory jurisdiction of the Court under Article 36 of the Statute - the so-called Optional Clause. Only about 45 States have accepted the Optional Clause and of these almost half have accepted it with severe reservations. No major power with the exception of Japan has accepted the Optional Clause with only minor or without reservations, nor has a single Communist nation accepted it. About 26 States have had one appearance before the Court, and eight (6 Western European, India and the U.S.) have had two or more.

The above statistics are discouraging and might not commend the I.C.J. for dispute settlement where broad acceptance of its jurisdiction is essential.

c. Special Tribunal

The third judicial method which might lend itself to the situation of environmental modification is a special Tribunal. Sohn²⁹ believes that such a body, in the case of the Law of the Sea, would have the advantages of permanence and the ability to act rapidly in emergencies. It would have members with special competence and could have attached to it a corps of specialists to provide expert advice. While this method may have decided advantages when applied to the law of the sea, it does not appear to be a viable solution in the case of the hostile use of environmental modification. It is doubtful that there would be sufficient activity to warrant a permanently sitting Tribunal.

L. U.N. Action in 1975

The General Assembly's First Committee³⁰ considered the report of the CCD which contained the U.S. - Soviet Draft Convention. On the recommendation of its First Committee, the General Assembly adopted without vote Resolution 3475 (XXX),³¹ dated 11 December 1975, requesting the CCD to continue the negotiations looking toward agreement on a text in 1976. The General Assembly considered that the adoption of such a convention would halt the use of environmental modification techniques

for hostile purposes, but would not affect their use for peaceful purposes. Finally the GA decided to include an item on the Agenda for its Thirty-First Session (Fall 1976) entitled "Convention on the prohibition of military or any other hostile use of environmental modification techniques: Report of the Conference of the Committee on Disarmament."

M. The U.S. and U.S.S.R. Call for Action at Opening of 1976 CCD³²

The representatives of the U.S. and the U.S.S.R., co-chairmen of the Conference of the Committee on Disarmament, called for the completion in 1976 of a draft convention banning the military or other hostile uses of environmental modification techniques, at the opening of the Fifteenth Session of the CCD in Geneva on 17 February 1976. Both representatives stressed the urgency of acting quickly to halt the potential for development of environmental warfare.

N. Senator Pell and Admiral Davies Optimistic on Treaty

In interviews³³ in early January 1976. Senator Claiborne Pell of Rhode Island, the Chairman of the Senate Sub-Committee on Oceans and International Environment, and Admiral Davies of ACDA, expressed optimism on the possibility for a treaty on environmental modification by the end of 1977. Admiral Davies believed that the CCD would send a slightly modified version of the U.S. - Soviet Draft Convention to the General Assembly for

its fall 1976 session and that the GA would adopt it. The Treaty would then be open for ratification by Member States in 1977.

Senator Pell³⁴ a proponent of such a treaty as early as 1972 was pleased with the progress made, but along with Representative Gilbert Gude of Maryland, was concerned with the qualification in the treaty of effects that are "widespread, long-lasting or severe," and whether this weakens it. Senator Pell scheduled hearings of his Sub-Committee on 21 January 1976 on the proposed treaty. Admiral Davies in the January interview blamed the State and Defense Departments' bureaucracies for reluctance to move ahead on Senator Pell's 1972 proposals for a treaty. He stated that the treaty would ban things that we are not even able to do at this time. However, if we delayed, research and development would proceed, and industry would develop. Then it would be too late to obtain an agreement.

O. The Pell Sub-Committee Hearings

The following information is based on the written Statements³⁵ submitted by the participants at the hearing on 21 January 1976, and generously provided to the author by Senator Pell's Washington Office. Any rebuttal statements, departure from these written statements or any other discussions were not available to the author at the time of writing.

(1) Senator Pell

Senator Pell in his opening statement referred to his

resolution, Senate Resolution 71, passed by an overwhelming majority of the Senate in July 1973, calling for negotiation of a treaty banning environmental warfare. He stated that the purpose of the hearing was to obtain a status report on the Convention negotiations in Geneva in the fall of 1975, and prospects for an agreement. Senator Pell also wanted to know whether the treaty could be strengthened by dropping the limitations based on "widespread, long-lasting or severe effects"; by including some verifiable types of military research and development; by dropping the requirement to go to the Security Council with complaints; and by removing the requirement that the treaty apply only to parties to it.

(2) Dr. Ikle, Director of ACDA³⁶

Dr. Fred C. Ikle, Director of ACDA expressed the view that the primitive state of environmental warfare techniques improved the chances for an early agreement before an institutional momentum in countries could develop and thwart an early agreement. He interprets Article I to apply to the hostile use of such techniques when states are employing other means of warfare as well as the case when only environmental modification techniques are used. He then states that the Convention covers the direct manipulation of the environment itself, "and not the incidental environmental impact produced by the use of other weapons." The exclusion of the environmental impact of other weapons may have been a typographical error in Dr. Ikle's statement. However, if the

statement is correct, then this would be a rather narrow interpretation and too restrictive. Secondary effects should be covered also. He qualified the extent of the effects to those which could cause significant harm to man and his environment. He used the terms significant or substantial as guidelines.

Dr. Ikle raised the question of verification of compliance, pointing out that verification decreases as the size of the activity decreases. The Convention does not prohibit research and development, because the techniques for peaceful and for hostile uses are similar, and could not be differentiated. He stated that the U.S. Government conducts all its research and development activities on environmental activities on an unclassified basis, and therefore these activities are verifiable, but the same could not be said for closed societies. He concluded his remarks by expressing optimism on the prospects for agreement on the Convention.

(3) Mr. Anderson, DOD³⁷

Mr. Dwayne S. Anderson of the Department of Defense (DOD) reviewed the status of DOD's current activities in the field. All Department of Defense weather modification operations are reported to the Department of Commerce and details of domestic operations are included in the Department of Commerce Report made public annually in accord with Public Law 92-205 of 18 December 1971. An annual Report of the Interdepartmental Committee for Atmospheric Sciences includes all DOD weather

modification research and development activities world-wide. He further stated that DOD was engaged only in cold fog dispersal at some military airfields, testing of warm fog dispersal techniques and conducting theoretical and statistical studies of previous rainfall enhancement experiments. In FY 1976, the DOD budget for this R & D is \$1.75 million, comprising about 10% of the total national R & D funding for weather modification.

(4) Representative Gude (Maryland)³⁸

Representative Gilbert Gude was concerned that the draft convention contained loopholes, and thus was not comprehensive. He considered vague the use of the words "widespread, long-lasting or severe," and that some hostile environmental modification activities could still take place under those guidelines. Representative Gude referred to a letter of 24 September 1975 from Dr. Ikle responding to his query on the types of rainmaking activities banned under the treaty. The letter stated that precipitation modification efforts in Southeast Asia in the 1960's did not achieve the damaging effects desired in a military operation. However, if these methods were perfected so that their use caused widespread long-lasting or severe effects, they would be banned. The implication is that an activity producing results like those in Southeast Asia would be permitted.

Representative Gude believes that the Convention would pose two tests - an intent test and an effect test. An intent test

would be valid, but not conclusive. An effects test can only be applied after the fact, and then it is too late. Therefore, he proposes an outright ban on all warfare by environmental modification, and an end to all research in the field conducted under the aegis of the military.

(5) Dr. Weiss³⁹

Dr. Edith Brown Weiss presented a statement to the Subcommittee decrying the ambiguities, ill-defined terms, and incomprehensiveness of the draft Convention. She recommended the deletion of the words "widespread, long-lasting and severe:" thus banning all hostile use of environmental modification techniques. Dr. Weiss believes that language should be included specifically banning the incidental use of these techniques to facilitate the effectiveness of other weapons.

She raised the problem of enforcement in the Security Council where the major powers have the veto, and proposes that no country have a veto in these matters. However, she does not have any proposal for achieving this veto-proof state. She rightly refers to Principle 21 of the Stockholm Declaration on the Human Environment which provides that a State has the responsibility to prevent activities under its control from damaging the environment of others. I will discuss the evolution of this Principle in some detail later. She also raises the very important Stockholm Principle 22, which calls for the further development of international law concerning liability and compensation for

environmental damage. Dr. Weiss concludes that to forestall covert use of these techniques, requires expanded international programs for monitoring, forecasting and research on oceanic and atmospheric conditions.

III. Emerging International Environmental Law

Judging from the reference to disarmament in the Preamble to the U.S./Soviet Draft Convention, its resort to the Security Council which deals with threats to the peace, and its consideration by the Conference of the Committee on Disarmament, this treaty probably would be considered as solely a disarmament proposal.

However, I feel the Convention's real importance lies in its contribution to the evolution of international environmental law, and it is in this context that it should be judged. A brief survey of some of the emerging patterns in international environmental law will provide an appreciation for the real importance of the Draft Convention. On the following pages, I will present a brief and far from complete review of the developing trends in international environmental law.

A. Trail Smelter Arbitration

In enumerating the duties of States, von Glahn⁴⁰ includes the obligation of a State to ensure that no activities are conducted under its jurisdiction which pollute the air or water of a neighboring State. He notes that little treaty law exists

in this field, but "general principles of justice" would apply. He uses the Trail Smelter Arbitration to support his belief.

In 1909, the United States and Great Britain concluded a bilateral agreement concerning U.S. - Canadian boundary waters, by which each agreed not to pollute these waters to the detriment of the health or property of the other. Under this agreement, the United States submitted a claim to the International Joint Commission in 1928 claiming that fumes from a smelter in British Columbia were polluting the State of Washington. The decision of the Commission was not accepted by the United States, and the case was submitted to arbitration. The United States was awarded damages by the arbitral decision in 1941, and Canada was ordered to place controls on future emissions.

The most important outcome of the case was the finding by the Arbitral Tribunal that under the principles of international law, no State may use or permit the use of its territory to injure by fumes persons or property in another State, and further that Canada was responsible under international law for the actions of the smelter. Professor Goldie⁴¹ holds that Trail Smelter and later decisions in Corfu Channel and Lac Lanoux point to the emergence of strict liability as a principle of public international law. Strict liability requires proof that damage occurred and that the defendant caused the damage, but negligence need not be proved. An Act of God or an Act of War may be used as a defense under strict liability. There is a growing acceptance of strict liability in international environmental pollution cases.

B. Corfu Channel Case⁴²

In October 1946, a squadron of British warships sailed through the North Corfu Channel, which passes through Albanian waters. During the transit one ship struck a mine and another also struck a mine while coming to the aid of the first. Great Britain demanded damages, but Albania refused, and therefore Great Britain took the case to the International Court of Justice in May 1947. The Court ruled in 1949 that Albania was responsible under international law for the explosions in Albanian waters and for the damage and loss of life, and further that Albania should pay compensation to Great Britain. Goldie⁴³ in tracing the development of strict liability points out that Albania's liability resulted from the presence of the mines in her waters and not from any ill will or neglect which Great Britain would have had to prove.

C. Lac Lanoux⁴⁴

The border between France and Spain was determined by a number of treaties ending with the Treaty of Bayonne of May 26, 1866 which delineated the border from Andorra to the Mediterranean. That same day by an Additional Act, the two countries agreed to make special arrangements "for the enjoyment of waters of common use," provisions which, due to their general character claim a special place..." The provisions of the Act required consultation and agreement before any changes in the watercourse could be made. Lake Lannoux is located in France in the area covered

by the Act and is drained by a river which flows into the Carol River, which flows from France into Spain.

From 1917 on, the French proposed various schemes for using the lake, but the Spanish always objected. In 1950, a French proposal was made to utilize the lake for hydroelectric power generation, but the full amount of water would ultimately be returned to the Carol River and continue to flow into Spain. Again the Spanish objected on the basis that the natural basin of the lake would be altered. After bilateral discussions without agreement, the French in 1955 decided to proceed with their hydroelectric project. The dispute finally went to an Arbitration Tribunal in 1956. The Tribunal ruled for France, finding no violation of the Treaty of Bayonne or the Additional Act, and further found no violation of any rule of international law.

The importance of this case to environmental law lies in the following statement by the Tribunal:

"It could have been argued that the works would bring about a definitive pollution of the waters of the Carol or that the returned waters would have a chemical composition or a temperature or some other characteristic which could injure Spanish interests. Spain could then have claimed that her rights had been impaired in violation of the Additional Act." Goldie⁴⁵ finds that here also strict liability would apply.

D. United States Nuclear Tests

The United States carried out a series of nuclear tests in

March and April 1954 at the Pacific Providing Grounds in the Marshall Islands. Some Japanese fishermen and some Marshall Islanders sustained injuries from the March 1 tests. These injuries resulted in diplomatic activity between Japan and the United States culminating in an exchange of notes on 4 January 1955. The U.S. Note⁴⁶ expressed deep concern and sincere regret for the injured Japanese fishermen and tendered two million dollars as compensation, ex gratia, to the Japanese Government, without reference to liability and as an additional expression of concern and regret. The sum was to be distributed in an equitable manner as determined by the Japanese Government, and would cover the Japanese Government's claim for medical and hospital expenses and also include an extra payment for each fisherman. The Note upon acceptance by the Japanese would result in full settlement of any and all claims against the United States for any Japanese injuries or damages arising from the relevant nuclear tests. The Japanese Note accepted the conditions specified in the U.S. Note.

Goldie⁴⁷ considers that this payment showed United States concern and a moral obligation, although negligence was never established. He believes this to be an important example for future scientific activities, but only of auxiliary importance in customary international law relating to liability.

E. Nuclear Test (Australia and New Zealand vs. France)⁴⁸

Australia and New Zealand in May 1973 brought a complaint

against France before the International Court of Justice, seeking to have further atmospheric nuclear-weapon tests declared contrary to rules of international law and to order France to halt her testing. Australia and New Zealand also requested the imposition of interim measures of protection. France refused to accept the competence of the Court and was not represented at the hearings. Australia and New Zealand pleaded for interim measures, and in June, the Court adopted interim measures of protection, ordering the parties to take no action to aggravate the situation before final action could be taken.

The Court set and then extended time limits for presentations on the question of the Court's jurisdiction. Australia and New Zealand complied, but France did not. Eight public sittings were held in July 1974 to consider the question of jurisdiction, with Australia and New Zealand presenting arguments, but France was not represented. France, however, through the statements of various public officials announced its intention to halt atmospheric tests after the completion of its 1974 tests.

On 20 December 1974, the Court by a 9 to 6 vote ruled that the claims of Australia and New Zealand no longer applied due to the statements by the President of France and other officials that France would halt atmospheric testing in the Pacific.

F. U.N. Conference on the Human Environment⁴⁹

The Conference on the Environment was held in June 1972 in Stockholm and was attended by most countries with the conspicuous

exception of the Soviet Union and its closest allies in Eastern Europe. Among the major decisions taken by the Conference was the adoption unanimously of a Declaration on the Human Environment⁵⁰ containing 26 principles to guide nations in the solution of their environmental problems. The Conference was unable to agree on a 27th principle relating to the obligation of countries to inform one another of the possible effects on the environment of their activities.

The second part of Principle 21 carries on the important principle enunciated in Trail Smelter as follows:

"States have...the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction." Unfortunately the first part of Principle 21 limits the above statement somewhat, by allowing states to exploit their resources in accordance with their own policies.

Principle 22 requires States to cooperate in the development of international law regarding liability and compensation for the victims of pollution and other environmental damage beyond their borders.

In addition to the Declaration, the Conference unanimously adopted an Action Plan with 109 recommendations for international action and the same number addressed to countries for national action. Some of the major action proposals in the Plan are as follows: (1) the adoption of an Ocean Dumping Convention;

(2) the minimization of the emission of certain dangerous pollutants into the environment; (3) an Earthwatch program to monitor and assess environmental trends in oceans, land, atmosphere and health; (4) a 10-year moratorium on whaling; and (5) an environmental referral service to facilitate exchange of environmental information.

The Conference unanimously recommended institutional arrangements for the United Nations Environmental Program to the General Assembly.

G. U.S. - U.S.S.R. Agreement on Cooperation in the
Field of Environmental Protection⁵¹

During President Nixon's visit to the Soviet Union in May 1972, he and President Podgorny signed a landmark agreement pledging the two countries to cooperate in solving problems of the environment, studying and preventing pollution, and making progress in controlling the impact of human activities on nature. The following areas of cooperation were highlighted in the Agreement:

- "air pollution;
- water pollution;
- environmental pollution associated with agricultural production;
- enhancement of the urban environment;
- preservation of nature and organization of preserves;
- marine pollution

biological and genetic consequences of environmental pollution
influence of environmental changes on climate;
earthquake prediction;
arctic and subarctic ecological systems;
legal and administrative measures for protecting environmental quality."

The Agreement has been implemented by the establishment of a high-level U.S. - U.S.S.R. Joint Committee with many working groups. Meaningful progress in studying the environment has been made under this Agreement. Although this type of agreement is non-binding and solely involves a commitment for increased bilateral cooperation, it is another method for promoting interest and action leading to increased concern for and protection of the environment. Since the signing of this Agreement, both the United States and the Soviet Union have entered into similar agreements with other countries.

H. Other Examples

There are many other examples of environmental law and other actions, which are beyond the scope of this paper, but some should be enumerated at the very least. I will list them in three categories: unilateral, regional and global. Unfortunately many of the global conventions are not yet in force and some may never be.

(1) Unilateral

Canadian Arctic Waters Pollution Prevention Act (1970).⁵²

(2) Regional

Convention on the Protection of the Marine Environment
of the Baltic Sea Area - 1974.⁵³

Paris Convention for the Prevention of Marine Pollution
from Land-Based Sources - 1974.⁵⁴

Convention to Fight Pollution in the Mediterranean Sea
1976.⁵⁵

(3) Global

Geneva Convention on the High Seas - 1958.⁵⁶

International Convention for the Prevention of Pollution
of the Sea by Oil - 1954 (as amended in 1962).⁵⁷

Convention on the Liability of Operators of Nuclear
Ships - 1962.⁵⁸

International Convention on Civil Liability for Oil Pollu-
tion Damage - 1969.⁵⁹

Convention on the Establishment of an International Fund
for Compensation for Oil Pollution Damage - 1971.⁶⁰

International Convention Relating to Intervention on the
High Seas in Cases of Oil Pollution Casualties - 1969.⁶¹

Convention on the Prevention of Marine Pollution by Dumping
of Waste and Other Matter - 1972.⁶²

International Convention for the Prevention of Pollution from Ships - 1973.⁶³

U.N. Law of the Sea Conference - Spring 1976 (not yet convened at time of writing).

IV. Activities of International Organizations

A. World Meteorological Organization (WMO) Statement On Modification of the Ozone Layer Due to Man's Activities⁶⁴

The Seventh WMO Congress in June 1975 decided that there was an urgent need for more studies with a definitive view to find how much man-made pollutants may be reducing the amount of ozone in the stratosphere, and also the role of chlorofluoromethanes in destroying ozone. The Congress further decided that a WMO statement was needed on the possible effects of man's activities on the ozone layer.

In response to this call, the first meeting of the WMO Commission for Atmospheric Sciences Working Group on Stratospheric and Mesospheric Problems assisted by a number of the world's leading experts in this field was convened in Geneva from 8-11 September 1975. In addition to ozone experts, representatives of the International Council of Scientific Unions (ICSU) and the United Nations Environment Program (UNEP) were also represented.

This group of experts prepared a statement on modification of the ozone layer due to man which was released by WMO on 6 January 1976 and was widely publicized in the United States.

The statement concluded as follows:

- Currently planned SST's due to their limited numbers (30 - 50) and lower flight altitude (17 km) would not have a significant effect.
- A large fleet of SST's flying higher would have a noticeable effect on the ozone layer, and therefore international agreement may be needed for total emissions.
- There is no likelihood of significant change in the ozone layer due to changing agricultural practices, but it is worthy of further study.
- The evidence confirms that continued release of chloro-fluoromethanes into the atmosphere may reduce the ozone layer significantly. At the 1972 rate of release, a 10 percent average ozone depletion (with an uncertainty factor of two) could be expected.

Ultraviolet radiation in the wavelengths 283 - 320 nm reaching the earth's surface would increase 20 percent, if the ozone were reduced by 10 percent, and the temperature of the upper stratosphere would decrease up to 10 percent. However, the full consequences on the earth's climate would be difficult to determine.

The WMO Statement concludes with a recommendation for an international monitoring and study program on all aspects of the stratosphere related to ozone.

This is an excellent example of one avenue of progress open to us in evaluating international environmental problems and disseminating the results to Governments and the people. It can provide an authoritative evaluation by recognized experts under the auspices of an intergovernmental organization - hopefully in time to permit corrective action.

B. WMO/UNEP Informal Meeting on Legal Aspects of Weather Modification

(1) U.N. Action

In 1974, the U.N. General Assembly⁶⁵ in considering the report of the Governing Council of the UNEP, called upon the executive Director of UNEP inter alia,

"to accelerate consultations with the World Meteorological Organization, with jurists, scientists and other experts with the purpose of developing a set of general principles and operative guidelines on studies for man-induced weather modification and related environmental phenomena, including their operational and research aspects, and to report to the Governing Council at its fourth session;" (i.e. 1976)

(2) UNEP Action

The Third Session of the UNEP Governing Council⁶⁶ in 1975 defined its strategy in reference to legal aspects of weather modification as follows:

1. continued consultations towards defining the responsibility of States to ensure that weather modification experiments or operations under their jurisdiction do not damage the environment

of other States or areas beyond the limits of national jurisdiction (Trail Smelter and the Stockholm Declaration Principle 21);

2. continued consultations with WMO and other scientific and legal experts on the desirability of establishing general principles and operating guidelines on weather modification experiments and operations; a meeting of experts on the above; delay of an intergovernmental meeting to consider the above until a consensus is reached by the experts.

The Governing Council also noted that the solutions to many environmental problems depended on environmental law, and that the development of such law was indispensable to the success of UNEP activities.

(3) WMO Action⁶⁷

The WMO Congress in 1975 established a Weather Modification Program including a Precipitation Enhancement Project (PEP). The PEP will be an internationally planned, conducted and evaluated experiment in artificial precipitation stimulation. The Congress also expressed the desire to minimize any legal liability of WMO. It believed that the development of legal principles should go hand in hand with scientific progress, and that a better understanding of the physical basis of weather modification was needed before the WMO would be in a good position to advise its Members on the subject. When a Member of WMO requests advice from WMO, a group of experts should be set up to help in the planning, conduct and evaluation of the project,

but funding would be the Member's responsibility.

The WMO is initiating a register of weather modification activities by sending a questionnaire to its Members. A request for legal information is also included.

(4) WMO/UNEP Informal Meeting
Convenes⁶⁸

The WMO/UNEP Informal Meeting was held in Geneva, 17-21 November 1975. It was the second such meeting of WMO and UNEP experts and was mainly exploratory, consisting of an exchange of views.

There was general agreement on the need for improved collection and exchange of legislative information. The meeting suggested that WMO request detailed legislative information from its Members in connection with its questionnaire on weather modification activities. There were reservations concerning the feasibility of technical assistance on legal aspects at this stage of scientific knowledge. While legal rules on registration and data reporting were considered helpful, premature rules on liability for damage were thought to be potentially counter-productive.

There was much discussion on the distinction for legal purposes between an experiment and an operation. In an experiment the major objective is using scientifically accepted methods to obtain information, while in an operation the objective is

to influence atmospheric processes to produce a desired effect. It was felt that for purposes of assessing legal liability there would be no distinction between the two. The view was expressed that the development of beneficial technology should not be unduly constrained by punitive legal sanctions.

In considering a possible principle recognizing the obligation of States to compensate persons beyond their borders for damages, the WMO experts noted that it was not possible to assess such damage with the present state of the art and that such a principle was premature. The UNEP experts considered it useful to include a principle that States shall cooperate in the development of a legal regime for international weather modification regulation. It was suggested that a desirable general principle would call on States to adopt national legislation.

I believe that from the above it is obvious that this meeting was very cautious and tentative in its deliberations. The next step will probably be information collection based on the expanded WMO questionnaires.

V. Summary and Conclusions

The U.S./U.S.S.R. Draft Convention is a useful step both as a disarmament proposal and as an example of progress in international environmental law. The qualifying terms "widespread, long-lasting and severe effects" should be deleted

from the Convention, so that all hostile uses of environmental modification techniques are prohibited.

Compulsory and binding dispute settlement would, of course be the ideal, but I have grave doubts that this would be internationally acceptable at this time. The Security Council as the mechanism for dispute settlement is unsatisfactory for the reasons presented earlier, and I would recommend in its place one of the following listed in order of preference: arbitration, the International Court of Justice, a special Tribunal.

The hostile uses of environmental modification techniques are not what we really have to be concerned about, but rather the normal poorly-conceived activities of States which have the potential for harmful (if not intentional) consequences. Such environment modifying activities carried out with no intent to harm, would include large fleets of SST's traversing the stratosphere, undiminished use of fluorocarbons and diversion of northward flowing Siberian rivers.

An international reporting system for activities with the potential for environmental modification should be initiated on a mandatory basis. The United States presently has such a law⁶⁹ which requires anyone engaged in weather modification to submit a report to the Secretary of Commerce (NOAA administers the law) before, during or after such activities, as determined by regulations established to implement the law. Compulsory international reporting will not be enthusiastically received,

but to make the requirement more acceptable, it might be compulsory only for large scale activities or any activity carried out within 50 - 100 km of the border with another State or in any area beyond the limits of national jurisdiction. The WMO is instituting a voluntary reporting scheme for weather modification activities as indicated earlier.

The prime collectors and depositories for such information should be the WMO and UNEP with assistance in the collection of information from UNESCO and its Intergovernmental Oceanographic Commission, FAO, IAEA, WHO and others.

Principle 21 in the Stockholm Declaration providing that States have the responsibility to ensure that activities within their jurisdiction or control do not damage the environment of their neighbors or areas beyond national jurisdiction, should be included as a separate article in the US/USSR Draft Convention and in every other international environmental agreement. At the very least it should appear in the preamble to such Conventions, so that it becomes a universally recognized rule or international law.

There is a need for an early warning system for environmental hazards where unbiased international scientific expertise could be brought to bear on a potential hazard, an evaluation made, and this scientific evaluation publicized widely. I believe that this broad international exposure would, in a number of cases, exert a damping effect on the activity,

and might preempt the need for the next and less palatable step of compulsory dispute settlement. I would view the International Council of Scientific Unions (ICSU) as the prime source of the scientific expertise with representation and in particular funding from WMO, UNEP and others, but without the control of these organizations.

NOTES

- ¹Time Magazine, Feb. 16, 1976, p. 14.
- ²New York Times, Dec. 10, 1975, p. 25.
- ³New York Times, Dec. 10, 1975, p.19
- ⁴U.S. News and World Report, "Efforts to Control Weather," Jan. 5, 1976, p. 61.
- ⁵Congressional Quarterly Almanac, "Major Congressional Action - Environmental Warfare," 1973, Vol. XXIX, p. 664.
- ⁶U.S. Dept. of State Bulletin, "Text of Joint Communique," July 3, July 29, 1974, pp. 185-191.
- ⁷U.S. Dept. of State Bulletin, "Statement on Dangers of Military Use of Environmental Modification," July 3, p. 185.
- ⁸U.S. Participation in the U.N., 1974. Dept. of State Publication 8827, Sept. 1975, pp. 68-70
- ⁹New York Times, "China's Delegates to the U.N. Slowly Ending Isolation," Nov. 6, 1975, p. 54.
- ¹⁰U.S. Participation in the U.N. 1974, op. cit.
- ¹¹Ibid.
- ¹²Ibid.
- ¹³Washington Post, "Soviet Cite Perils of Weather War," Oct. 24, 1974.
- ¹⁴U.S. Participation in the U.N. 1974, op.cit.
- ¹⁵Ibid.
- ¹⁶U.N. General Assembly Resolution, A/RES/3264 (XXIX), 7 Jan. 1975, Annex pp. 1-5.
- ¹⁷U.S. News and World Report, op.cit
- ¹⁸23 UST 701, TIAS 7337
- ¹⁹Editorial Comment, Journal of Environmental Policy and Law, June 1975, No. 1, p. 8.

²⁰Ibid.

²¹Ibid.

²²Union of International Associations, Yearbook of International Organizations, 1974, pp. 604-605.

²³U.N. General Assembly, XXX Session, "Report of the Conference of the Committee on Disarmament," a/10027, 3 Oct. 1975, pp. 9-10

²⁴Ibid., pp. 277-282.

²⁵U.N. Office of Public Information, Charter of the United Nations and Statute of the International Court of Justice, New York, p. 19.

²⁶Louis B. Sohn, "Settlement of Disputes Arising Out of the Law of the Sea Convention," San Diego Law Review, Vol. 12, No. 3, April 1975, pp. 495-517-

²⁷Ibid.

²⁸John K. Gamble, Jr., Fischer, Dana D., The International Court of Justice, 1976, Lexington Books, pp. 79-103.

²⁹Sohn op. cit.

³⁰U.N. General Assembly XXX Session, "Report of the First Committee," A/10444, 10 Dec. 1975, pp. 1-4.

³¹U.N. General Assembly XXX Session, "Resolutions Adopted on the Reports of the First Committee," A/0444 p. 59.

³²New York Times, "U.S. and Soviet Ask Early Action to Ban Weather Warfare," Feb. 18, 1976, p. 6.

³³Bruce De Silva, "Senator Pell Sees Weather Treaty Within 2 Years," Providence Journal, Jan. 11, 1976, p. A-5

³⁴Congressional Quarterly Almanac, 1973, op. cit.

³⁵Senator Pell Hearings, Written Statements per each participant were provided by Sen. Pell's Washington Office, "Sen. Pell's Opening Statement."

³⁶Ibid., "Dr. Ikle's Statement."

- ³⁷Ibid., "Mr. Anderson's Statement."
- ³⁸Ibid., "Representative Gude's Statement."
- ³⁹Ibid., "Dr. Weiss' Statement."
- ⁴⁰Gerhard von Glahn, Law Among Nations, Second Edition, 1970, MacMillan Publishing Co., pp. 178-179.
- ⁴¹L. F. E. Goldie, "International Principles of Responsibility for Pollution," Columbia Journal of Transnational Law, Vol. 9:2, 1970, pp. 306-307
- ⁴²Gerhard von Glahn, 1970, op. cit., pp. 292-295.
- ⁴³L. F. E. Goldie, 1970, op. cit., p. 307.
- ⁴⁴Brunson MacChesney "Judicial Decisions," American Journal of International Law, Vol. 53, 1959, pp. 156-161.
- ⁴⁵L. F. E. Goldie, 1970, op. cit., p. 307.
- ⁴⁶U.S. Dept. of State Bulletin, Jan. 17, 1975, pp. 90-91.
- ⁴⁷L. F. E. Goldie, 1970, op. cit., p. 307
- ⁴⁸U.S. Participation in the U.N., 1974, op. cit., pp. 389-390.
- ⁴⁹U.S. Participation in the U.N., 1972, op. cit., pp-102-104.
- ⁵⁰Dept. of State Bulletin, July 24, 1972, pp. 116-118.
- ⁵¹23 UST 845, TIAS 7345
- ⁵²Richard B. Bilder, "The Canadian Arctic Waters Pollution Prevention Act: New Stresses on the Law of the Sea," Michigan Law Review, Nov. 1970, Vol. 69, No.1, pp. 1-54.
- ⁵³Richard Tucker Scully, International Regulation of Marine Pollution from Land-Based Sources, MMA Thesis, Apr. 24, 1974, pp. 1-43
- ⁵⁴Ibid.
- ⁵⁵New York Times, "12 Countries Sign a Pollution Pact," Feb. 17, 1976, p. 5

⁵⁶13 UST 3212, TIAS 5200.

⁵⁷12 UST 2989, TIAS 4900; 17 UST 1523, TIAS 6109.

⁵⁸Michael Hardy, "The Liability of Operators of Nuclear Ships," International and Comparative Law Quarterly, July 1963, Vol. 12, pp. 778-788.

⁵⁹Congressional Research Service, Treaties and Other International Agreements on Fisheries, Oceanographic Resources, and Wildlife to Which the United States is Party, Dec. 31, 1974, Washington, D.C., U.S. Government Printing Office, 1974, pp. 488-497.

⁶⁰Ibid., pp. 498-517.

⁶¹Ibid., pp. 473-487.

⁶²Robert J. McManus, "The New Law on Ocean Dumping," Oceans, 1973, pp. 25-32.

⁶³Robert J. McManus, "The New Treaty on Vessel Pollution," Oceans, July 1974, pp. 59-65.

⁶⁴World Meteorological Organization, "Press Release No. 315," Jan. 6, 1976.

⁶⁵U.N. General Assembly XXIX Session, 1974, A/9961, pp. 10-13.

⁶⁶U.N. General Assembly XXX Session Official Records, Supplement No. 25 (A/10025), pp. 46-48, 101-102.

⁶⁷World Meteorological Organization, "Report of the WMO/ UNEP Informal Meeting on Legal Aspects of Weather Modification," Geneva, 17-21 Nov. 1975, pp. 1-8.

⁶⁸Ibid.

Public Law 92-205, 1, Dec. 18, 1971, 85 Stat. 735, 15 U.S.C. 330-330e.