ASIAN-AFRICAN LEGAL CONSULTATIVE COMMITTEE

REPORT
OF THE
SIXTH SESSION
CAIRO
1964

ASIAN-AFRICAN LEGAL CONSULTATIVE COMMITTEE

REPORT

of the

SIXTH SESSION

held at

CAIRO

from 24th February to 6th March

1964

Published by

THE SECRETARIAT OF THE COMMITTEE

D-11, Defence Colony

New Delhi, India

Published by
The Secretariat of the Asian African Legal Consultative Committee
D-11, Defence Colony, New Delhi-3, INDIA.

Printed at OXFORD PRINTING WORKS New Delhi

CONTENTS

THE LEGALITY OF NUCLEAR TESTS
REPORT OF
THE COMMITTEE AND BACKGROUND MATERIAL

APPENDICES

INTRODUCTORY NOTE

Establishment and Functions of the Committee

The Asian Legal Consultative Committee, as it was originally called, was constituted by the governments of Burma, Ceylon, India, Indonesia, Iraq, Japan and Syria as from the 15th November 1956, to serve as an Advisory Body of Legal Experts, to deal with problems that may be referred to it, and to help in the exchange of views and information on matters of common concern between the participating countries. In response to a suggestion made by the Prime Minister of India, which was accepted by all the participating countries in the Asian Legal Consultative Committee, the Statutes of the Committee were amended with effect from the 19th April 1958, so as to include participation of countries in the African continent. Consequent upon this change in the Statutes, the name of the Committee was altered, and it was renamed as the Asian-African Legal Consultative Committee. Membership of the Committee is open to the countries in the Asian and African continents in accordance with the provisions of its Statutes.

The United Arab Republic upon its formation by the merger of Egypt and Syria became an original participating country in the Committee in the place of Syria. Sudan was admitted to the Committee with effect from the 1st October 1958, Pakistan from the 1st January 1959, Morocco from the 24th February 1961, Thailand from the 6th December 1961, and Ghana from the 28th October 1963.

The Committee is governed in all matters by its Statutes and the Statutory Rules. Its functions as set out in Article 3 of the Statutes are:

(a) Examination of questions that are under consideration by the International Law Commission, and to arrange for the views of the Committee to be placed before the said Commission; to consider the reports of the Commission and to make recommendations thereon to the governments of the participating countries;

(b) Consideration of legal problems that may be referred to the Committee by any of the participating

countries and to make such recommendations to governments as may be thought fit;

(c) Exchange of views and information on legal matters of common concern; and

(d) To communicate with the consent of the governments of the participating countries, the points of view of the Committee on international legal problems referred to it, to the United Nations, other institutions and international organisations.

The Committee normally meets once annually by rotation in the countries participating in the Committee. Its first Session was held in New Delhi, the second in Cairo, the third in Colombo, the fourth in Tokyo, the fifth in Rangoon and the sixth in Cairo. The Committee has a permanent secretariat in New Delhi for the conduct of its day-to-day work. A section of the Secretariat is charged with the collection of material and preparation of background papers for assisting the Committee in its deliberations during the sessions. The Committee functions in all matters through its Secretary who acts in consultation with the Liaison Officers appointed by each of the participating countries. The Liaison Officers normally meet once a month or as often as necessary.

Office Bearers of the Committee and its Secretariat

The Committee during its First Session elected the Member for Burma, Hon'ble Chief Justice U MYINT THEIN, and the Member for Indonesia, Hon'ble Chief Justice DR. WIRJONO PRODJODIKORO respectively as President and Vice-President of the Committee for the year 1957–58. During the Second Session, the Committee elected the Member for the United Arab Republic, H. E. MR. ABDEL AZIZ MOHAMED, President of the Cour de Cassation, as President and the Member for Ceylon, Hon'ble Chief Justice MR. H.H. BASNAYAKE as Vice-President of the Committee for the year 1958-59. At its Third Session, the Member for Ceylon, Hon'ble Chief Justice MR. H. H. BASNAYAKE was elected as President and CHAUDHURI NAZIR AHMED KHAN, Attorney-General of Pakistan, was elected as Vice-President of the Committee. At its Fourth Session, the Member for Japan, DR. KENZO TAKAYANAGI,

President, Cabinet Commission on Constitutional Reforms, was elected as President and Hon'ble DR. WIRJONO PRODJODIKORO, Chief Justice of the Republic of Indonesia, as Vice-President of the Committee. At its Fifth Session, the Member for India, Hon'ble MR. M. C. SETALVAD, Attorney-General of India, was elected as President and Hon'ble MR. A. T. M. MUSTAFA, Minister for Law of the Government of East Pakistan, was elected as Vice-President of the Committee. At the Sixth Session of the Committee, the Committee elected the Member for U. A. R., MR. HAFEZ SABEK, Ex. President of the Court of Cassation, Cairo, as President and the Member for Ghana, MR. J. K. ABENSETTS, Solicitor-General of Ghana, as Vice-President of the Committee.

The Committee at its First Session decided to locate its Permanent Secretariat at New Delhi (India). The Committee also decided during its First, Second, Fourth and Sixth Sessions that MR. B. SEN, Hon. Legal Adviser to the Ministry of External Affairs, Government of India, should perform the functions of the Secretary to the Committee.

Co-operation with other Organizations

The Committee maintains close contacts with and receives published documents from the United Nations, the Specialised Agencies, the International Law Commission, the Organisation of American States, the Arab League and the International Institute for Unification of Private Law. The Committee is empowered under its Statutory Rules to admit to its sessions Observers from international and regional inter-governmental organisations. The International Law Commission was represented at the Committee's Fourth, Fifth and Sixth Sessions respectively by DR. F. V. GARCIA-AMADOR, DR. RADHABINOD PAL, and MR. EDUARDO JIMENEZ DE ARECHAGA, Chairman of the International Law Commission. The Secretary-General of the United Nations was represented at the Committee's Fifth Session by MR. OSCAR SCHACHTER of the U.N. Secretariat and at the Sixth Session by MR. LUIS MORENO VERDIN, Director of the U.N. Information Centre, Cairo. At the Sixth Session, the Office of the United Nations High Commissioner for Refugees and the Organisation of American States were also represented respectively by H. H. PRINCE SADRUDDIN AGHA KHAN and DR. F. V. GARCIA-AMADOR in the capacity of Observers. The Arab League also sent

representatives at the Committee's Second, Fifth and Sixth Sessions. The Committee sends Observers to the sessions of the International Law Commission in response to a standing invitation extended to it by the Commission. The Committee also sends observers to international conferences convened by the United Nations to discuss legal problems. At the Sixth Session the Committee took a decision to extend standing invitations to the Legal Counsel of the United Nations, the International Law Commission, the League of Arab States, the Organisation of African Unity and the Organisation of American States to be represented by Observers at future sessions of the Committee. In addition, the Secretary has the discretion to invite any agency of the United Nations to attend the sessions of the Committee having regard to the agenda of the particular session.

The governments of the participating countries in the Committee originally referred ten problems for the consideration of the Committee. These were:

(i) Functions, Privileges and Immunities of Diplomatic Envoys or Agents including questions regarding enactment of legislation to provide for Diplomatic Immunities (Referred by India and Japan);

(ii) Principles for extradition of offenders taking refuge in the territory of another State including questions relating to desirability of conclusion of extradition treaties and simplification of the procedure for extradition (Referred by Burma and India);

(iii) Law relating to the Regime of the High Seas including questions relating to the Rights to Sea-bed and Subsoil in the Open Sea (Referred by Ceylon and India);

(iv) Status of Aliens including questions of Responsibility of States regarding Treatment of Foreign Nationals (Referred by Japan);

(v) Restrictions on Immunity of States in respect of Commercial Transactions entered into by or on behalf of States and by State Trading Corporations (Referred by India);

(vi) Law of the Territorial Sea (Referred by Ceylon and U.A.R.);

(vii) Questions relating to Dual Citizenship (Referred by Burma);

(viii) Ionospheric Sovereignty (Referred by India);

(ix) Questions relating to Reciprocal Enforcement of Foreign Judgments in Matrimonial Matters (Referred by Ceylon); and

(x) Questions relating to Free Legal Aid (Referred by Ceylon).

First Session: During the First Session held in New Delhi, the Committee discussed and drew up reports for submission to the governments of the participating countries on three of the subjects, viz., Diplomatic Immunities, Principles of Extradition, and Immunity of States. The subjects were, however, carried forward for further considertion at the next session.

Second Session: During the Second Session held in Cairo, the Committee had before it five main subjects for consideration, viz., Diplomatic Immunities, Principles of Extradition, Immunity of States in respect of Commercial Transactions, Dual Nationality and Status of Aliens. It also discussed briefly the questions relating to Free Legal Aid and Reciprocal Enforcement of Foreign Judgments in Matrimonial Matters. The Committee also generally considered the Reports of the 9th and 10th Sessions of the International Law Commission.

The Committee finalised its Reports on Diplomatic Immunities and on Immunity of States in respect of Commercial Transactions. These Reports were submitted to the Governments of the participating countries. Final conclusions were not reached on the other subjects discussed at this Session.

Third Session: The Committee at its Third Session held in Colombo considered the comments of the governments on its Reports on Functions, Privileges and Immunities of Diplomatic Envoys, and Immunity of States in respect of Commercial Transactions, which the Committee had finalised during its Second Session in Cairo. The Committee affirmed the view it had taken in its Report with regard to restrictions on Immunity of States in respect

of Commercial Transactions. It, however, made certain changes in its Report on Diplomatic Immunities in the light of the comments received from the governments of the participating countries. This Report was later placed before the U.N. Conference of Plenipotentiaries on Diplomatic Relations.

The Committee gave detailed consideration to the subjects of Status of Aliens and Extradition on which it was able to draw up provisionally the principles governing the subjects in the form of Draft Articles. The Committee discussed the subject of Status of Aliens, which had been referred to it by the Government of Japan, on the basis of a memorandum presented to it by the Committee's Secretariat and information supplied by the governments of the participating countries regarding their laws and State practice with regard to entry, treatment and deportation of foreigners. The discussions on Extradition were based on the draft of a multilateral convention presented by the Government of the United Arab Republic and a memorandum submitted by the Committee's Secretariat. The Provisional Recommendations of the Committee on these two subjects were submitted to the governments of the participating countries for their comments.

The Committee also generally considered questions relating to Dual Nationality and the recommendations of the International Law Commission on Arbitral Procedure. The Committee decided to take up at its next session the question of Legality of Nuclear Tests and the legal aspects of certain economic matters, namely Conflict of Laws in respect of International Sales, and Relief against Double Taxation.

Fourth Session: The Fourth Session of the Committee was held in Tokyo from 15th to 28th February 1961. The Committee at this Session discussed in detail the subjects of Extradition and Status of Aliens on the basis of the Draft Articles as provisionally drawn up by the Committee at its Third Session. The Committee revised the drafts on the subjects in the light of the comments made by the Delegations present at the session and adopted its Final Reports for submission to the governments of the participating countries.

The subject relating to Diplomatic Protection of Citizens Abroad and State Responsibility for Maltreatment of Aliens was

also generally considered by the Committee. It took note of the statement made at this session by Dr. F. V. Garcia-Amador, Special Rapporteur of the International Law Commission on State Responsibility and decided to take up the subject for discussion at its next session.

The Committee also gave special attention to the question of Legality of Nuclear Tests. It considered the subject on the basis of the Report prepared by the Secretariat, and the Delegates of the participating countries of the Committee made statements on the question of Legality of Nuclear Tests indicating the scope of the subject under consideration of this Committee and the basic principles on which further material needed to be collected. After a general discussion on the subject the Committee unanimously decided that the consideration of this subject was a matter of utmost urgency and should, therefore, be placed as the first item on the agenda of the Fifth Session.

The Committee also considered the Report of the Secretariat on the work done by the International Law Commission at its Twelfth Session and took note of the statement made by the Observer on behalf of the International Law Commission.

The Committee considered the subjects relating to Free Legal Aid and Recognition of Foreign Decrees in Matrimonial Matters, and it decided to publish the Reports of the Rapporteur on both these subjects to be presented to the governments of the participaing countries.

The Committee also generally discussed other subjects on the agenda, viz. Arbitral Procedure, Conflict of Laws with regard to International Sales and Purchases, Laws relating to Avoidance of Double Taxation and Dual Nationality. The Committee decided to include all these subjects in the agenda of its Fifth Session.

Fifth Session: The Fifth Session of the Committee was held in Rangoon from 17th to 30th January 1962. The Committee at this session discussed in detail the subjects of Dual Nationality and Legality of Nuclear Tests. The subject of Dual Nationality was considered on the basis of a Draft Agreement presented by the Delegation of the United Arab Republic.

The Committee drew up a set of Draft Articles embodying the principles relating to elimination or reduction of dual or multiple nationality. It was decided that the Draft Articles should be submitted to the governments of the participating countries for comments and that the subject should be placed before the next session of the Committee for fuller consideration in the light of the comments received from the governments.

The Committee discussed the subject of Legality of Nuclear Tests on the basis of the materials on scientific and legal aspects of nuclear tests collected by the Secretariat of the Committee. The Committee heard the viewpoints and expressions of opinion on the various topics on the subject from the Delegations of Burma, Ceylon, India, Indonesia, Japan, Pakistan, Thailand and the United Arab Republic. The governments of Japan and the United Arab Republic also submitted written memoranda on the subject. On the basis of these discussions, the Secretary of the Committee drew up a Draft Report on the subject for consideration of the Committee. After a general discussion, the Committee decided that the Secretariat should submit the Draft Report to the governments of the participating countries for their comments and that the subject should be placed before the next session of the Committee as a priority item on the agenda.

The Committee also considered the subject of Arbitral Procedure and the Report of the Secretariat on the work done by the International Law Commission at its Thirteenth Session. The Committee decided that a report should be drawn up on Arbitral Procedure incorporating the views expressed by the various Delegations. The Committee also took note of the work done by the International Law Commission at its Thirteenth Session and expressed its appreciation of the very valuable services rendered by the distinguished Member for the United Arab Republic in representing the Committee as an Observer at that session. The Committee generally discussed the subject of Consular Intercourse and Immunities and decided to request the governments of the participating countries to transmit their comments on the Draft Articles, prepared by the Commission, to the Secretariat of the Committee. It was further decided that the Secretariat should prepare a report on the basis of these comments which should be considered as a priority item at the next session of the Committee.

The Committee at this session also considered certain proposals regarding revision of the Statutes of this Committee. A Sub-Committee consisting of one representative from each Delegation went into the matter in some detail and the recommendations of this Sub-Committee were accepted by the Committee. It was recommended that Articles 1, 3(a) and 3(c) should be amended and that a new Article, 2(a), should be introduced to provide for Associate Membership of the Committee under certain conditions. It was also recommended that certain consequential changes be made in the Statutory Rules of the Committee.

Sixth Session: The Sixth Session of the Committee was held in Cairo from 24th February to 6th March 1964.

At this Session, the Committee finalised its recommendations on the subjects of Dual Nationality and Legality of Nuclear Tests. It also discussed the subjects of Rights of Refugees and U.N. Charter from the Asian-African Viewpoint, which were referred by the Government of U.A.R. The questions relating to Reciprocal Enforcement of Judgments, Service of Process and Recording of Evidence in Civil and Criminal Cases, referred by the Government of Ceylon were considered by a Sub-Committee appointed at the Session.

The subject of Dual Nationality was discussed at this Session on the basis of the Preliminary Report adopted at the Fifth Session and the comments received thereon from the delegates. The Committee drew up and adopted its Final Report containing Model Rules embodying Principles relating to Elimination or Reduction of Dual or Multiple Nationality which it decided to submit to the Government of Burma, which had referred the subject for consideration, and to the governments of the other participating countries.

The question of Legality of Nuclear Tests, which was under consideration of the Committee since the Fourth Session, was finalised at this Session taking into account the Draft Report presented by the Secretary at the Fifth Session and the comments and memoranda received from the member governments thereon. The Committee was able to adopt its conclusions on the subject unanimously.

The Committee also considered certain questions relating to the recently concluded Vienna Conventions, viz. Vienna Convention on Diplomatic Relations 1961, Vienna Convention on Consular Relations 1963, and Vienna Convention on Nuclear Damage 1963, and took note of the Report on the Work Done by the International Law Commission at its Fifteenth Session submitted to it by DR. H. W. TAMBIAH who had represented the Committee as an observer at that Session.

The subjects which the Committee has been able to finalise so far are Diplomatic Immunities and Privileges, Immunity of States with regard to Commereial Transactions, Legal Aid, Reciprocal Enforcement of Judgments in Matrimonial Matters, Extradition, Status of Aliens, Dual Nationality and Legality of Nuclear Tests. The Committee has also finalised the provisions with regard to its privileges and immunities as an international organisation which have now been submitted to the Governments of Member States for implementation.

The Committee has made considerable progress on Diplomatic Protection and State Responsibility, Double Taxation, Laws relating to International Sales and Purchases, Reciprocal Enforcement of Judgments, Rights of Refugees and U.N. Charter from Asian-African Viewpoint. The Committee has also before it for consideration several of the other subjects including Law of the Territorial Sea, Law of Outer Space, Law of Treaties, Accessions to General Multilateral Treaties concluded under the auspices of the League of Nations and State Succession. It is also undertaking a publication of the Constitutions of Asian African Countries as also a digest of important decisions of the municipal courts of these countries on international legal questions. The Committee is also contemplating publication of its studies on International Economic Law, namely (1) Laws and Regulations relating to Export and Import Trade in the Member Countries, (2) Laws and Regulations relating to Control on Industry in the Member Countries and (3) Investment Laws and Regulations in the Member Countries.

I. Delegates of the Participating Countries and Observers Present at the Session

BURMA : Not Represented

CEYLON

Member and Leader of the Delegation : Hon. H. W. TAMBIAH,
Judge, Supreme Court of Ceylon.

Adviser : MR. H. L. DE SILVA,
Crown Counsel.

Adviser : MR. C. F. AMERASINGHE,
Lecturer in Law,
University of Ceylon.

GHANA

Member and Leader of the Delegation : MR. J. K. ABENSETTS,
Solicitor-General.

Alternate Member : MR. OSEI TUTU,
Director,
Legal and Consular Department,
Ministry of Foreign Affairs,
Accra.

Adviser : MR. OFOSU AMAH,
Lecturer in Law,
University of Ghana.

INDIA

Member and Leader of the Delegation : MR. C. K. DAPHTARY,
Attorney-General for India.

Alternate Member and Deputy Leader : MR. B. N. LOKUR,
Secretary to the Government of India,
Ministry of Law.

Adviser : DR. NAGENDRA SINGH,
Additional Secretary to the Government of India,
Ministry of Transport.

Adviser : Mr. G. A. Shah,
Joint Secretary to the Government of India, Ministry of Law.

Adviser : Dr. K. Krishna Rao,
Director,
Legal and Treaties Division,
Ministry of External Affairs.

Adviser : Mr. J. Abraham,
Counsellor, Indian Embassy,
Cairo.

INDONESIA

Member and Leader of the Delegation : Mr. Nugroho,
: Chief of Directorate for United Nations Affairs,
Department of Foreign Affairs.

Alternate Member : Dr. Hasjim Djalal,
Chief of the International Law Division,
Department of Foreign Affairs.

Adviser : Mr. Mardanoes,
Embassy of Indonesia, Cairo.

IRAQ

Member and Leader of the Delegation : Dr. Hasan Al-Rawi,
Director-General,
Legal Department,
Ministry of Foreign Affairs.

Alternate Member : Mr. Dhia Sheet Khattab,
Judge, Cour de Cassation, Iraq.

Adviser : Mr. Abdul Hussain Al-Jamali,
First Secretary,
Ministry of Foreign Affairs.

JAPAN

Member and Leader of the Delegation : Dr. Kenzo Takayanagi,
President of the Cabinet Commission on Constitution,
Government of Japan.

Alternate Member : Dr. Kumao Nishimura,
Member of the Atomic Energy Commission.

Adviser : Mr. Mitsuhiko Hazumi,
Second Secretary,
Embassy of Japan, Cairo.

Adviser : Mr. Chusei Yamada,
Second Secretary,
Embassy of Japan, New Delhi.

PAKISTAN Not Represented

THAILAND

Member and Leader of the Delegation : Dr. Sompong Sucharitkul,
Ministry of Foreign Affairs,
Government of Thailand.

Alternate Member : Dr. Sudhee Prasasvinichai,
Ministry of Foreign Affairs,
Government of Thailand.

UNITED ARAB REPUBLIC

Member and Leader of the Delegation, : Mr. Hafez Sabek,
Ex-President of the Court of Cassation.

Alternate Member and Deputy Leader : Mr. Mohamed Abdel Salam,
Attorney-General of U.A.R.

Adviser Mr. Adel Younis,
Judge of the Court of Cassation.

Adviser : Dr. Ezzeddin Abdalla,
Dean of the Faculty of Law,
Ein Shams University.

Adviser : Dr. Gaber Gaad Abdel Rahman,
Dean of the Faculty of Law,
Cairo University.

Adviser : Dr. Hamed Sultan,
Professor, Faculty of Law,
Cairo University.

Adviser : Mr. Saad El-Din Atia,
Chief, Legislative Department,
Ministry of Justice.

Adviser : Mr. Omar El-Sherief,
Councillor of the State Council.

Adviser : Mr. Abdel Aziz El-Shorbagy,
Dean of the Bar Association.

Adviser : Dr. Mohamed Hafez Ghanem,
Professor, Faculty of Law,
Ein Shams University.

Secretary to the Committee

Mr. B. Sen,
Senior Advocate of the Supreme Court of India and Hony. Legal Adviser,
Ministry of External Affairs,
Government of India.

OBSERVERS

Lebanon : Mr. Hassan Hachach,
Embassy of Lebanon, Cairo.

Liberia : Hon'ble Mr. Roland Barnes,
Assistant Attorney-General of Liberia.

Mali : Mr. Khalil Gouro,
Charge d'Affaires,
Embassy of Mali, Cairo.

Nigeria : Mr. O. O. Omolulu,
Solicitor-General of the Federation of Nigeria and Permanent Secretary,
Ministry of Justice.

Philippines : Mr. Froilan M. Maglaya,
Embassy of the Philippines, Cairo.

Arab League : Mr. Oni Abdel Hadi,
Chief of the Permanent Legal Committee.
Mr. Mamduh Azam,
Chief of Legal Section.
Mr. Saad Abdel Salam
Mr. Mustapha El Alfy,
Attache.
Mr. Sharaf El Din Abdalla,
Attache.

International Law Commission : Mr. Eduardo Jimenez de Arechaga,
Chairman, International Law Commission.

United Nations : Mr. Luis Moreno Verdin,
Director of the United Nations Information Centre, Cairo.

United Nations Office of the High Commissioner for Refugees : H.H. Prince Sadruddin Aga Khan,
U.N. Deputy High Commissioner for Refugees.
Dr. E. Jahn,
Chief of UNHCR Legal Section.
Mr. Omar Sharaf,
Acting Representative of UNHCR in Cairo.

Pan American Union : Mr. F. V. Garcia-Amador,
Director,
Department of Legal Affairs,
Pan American Union.

CONFERENCE ORGANISATION

Head of Organisation : Mr. Mohammed Abdel Salam,
Attorney-General of the U.A.R.

Conference Officer : Mr. Mohammed Hassan,
District Attorney,
Attorney-General's Office,
U.A.R.

Liaison Officer : Mr. Samih A. F. Sadek,
Second Secretary,
Ministry of Foreign Affairs, Cairo.

---

*LIAISON OFFICERS OF THE PARTICIPATING COUNTRIES ON THE COMMITTEE**

Burma : U Ba Maung,
First Secretary,
Embassy of Burma,
New Delhi.

Ceylon : Mr. I. B. Fonseka,
Counsellor,
Ceylon High Commission,
New Delhi.

Ghana : Mr. J. Owusu-Akyeampong,
Counsellor,
High Commission for Ghana,
New Delhi.

India : Mr. J. C. Ajmani,
Deputy Secretary,
Ministry of External Affairs,
Government of India,
New Delhi.

Indonesia : Mr. Husni Thamrin Pane,
First Secretary,
Embassy of Indonesia,
New Delhi. (Acting)

Iraq : Mr. Ahmad Al-Farisi,
Counsellor,
Embassy of Iraq,
New Delhi.

Japan : Mr. S. Tnaetani,
Minister,
Embassy of Japan,
New Delhi.

Pakistan : Mr. M. Rahman,
Deputy High Commissioner,
Pakistan High Commission,
New Delhi.

* As on 1st October 1964.

Thailand : MR. S. BAMRUNGPHONG,
First Secretary,
Embassy of Thailand,
New Delhi.

United Arab Republic : MR. SALAH A. ZAKI,
Third Secretary,
Embassy of the U.A.R.
New Delhi. (Acting)

II. AGENDA OF THE SESSION

I. ADMINISTRATIVE AND ORGANISATIONAL MATTERS

1. Adoption of the Agenda.
2. Election of the President and Vice-President of the Session.
3. Admission of new members in the Committee.
4. Admission of Observers to the Session.
5. Consideration of the Secretary's Report.
6. Further consideration of the Draft Articles on Immunities and Privileges of the Committee.
7. Appointment of the Secretary of the Committee.
8. Consideration of the Committee's programme of work for 1964–65.
9. Consideration of the question of printing and publication of the proceedings of the Sixth Session of the Committee and other publications.
10. Consideration of the question of the Committee's staff structure for the term 1964–66.
11. Co-operation with other organisations.
12. Date and place of the Seventh Session.

II. MATTERS ARISING OUT OF THE WORK DONE BY THE INTERNATIONAL LAW COMMISSION UNDER ARTICLE 3(a) OF THE STATUTES.

1. Consideration of the *Report of the Fifteenth Session of the International Law Commission.*
2. *Law of Treaties.*

III. MATTERS REFERRED TO THE COMMITTEE BY THE GOVERNMENTS OF THE PARTICIPATING COUNTRIES UNDER ARTICLE 3(b) OF THE STATUTES.

1. *Status of Aliens* (Referred by the Government of Japan)—(a) Diplomatic Protection of Aliens by their Home States and, (b) Responsibility of States arising out of Maltreatment of Aliens.

2. *Dual Nationality* (Referred by the Government of Burma)—Consideration of the Committee's Report adopted at the Fifth Session.

3. *United Nations Charter from the view of the Asian-African countries* (Referred by the Government of the United Arab Republic)—for preliminary discussion.

4. *The Rights of the Refugees* (Referred by the Government of the United Arab Republic)—for preliminary discussion.

5. *Law of the Territorial Sea* (Referred by the Government of United Arab Republic).

6. Consideration of (a) *the Vienna Convention on Diplomatic Relations* 1961, (b) *the Vienna Convention on Consular Relations* 1963, (c) *the Vienna Convention on Civil Liability for Nuclear Damage* 1963 (Referred by the Government of India).

7. *Enforcement of Judgments, the Service of Process and the Recording of Evidence among States both in civil and criminal cases* (Referred by the Government of Ceylon).

IV. MATTERS OF COMMON CONCERN TAKEN UP BY THE COMMITTEE UNDER ARTICLE 3(c) OF THE STATUTES.

1. *Legality of Nuclear Tests* (Adopted by the Committee at the suggestion of the Government of India).

2. *Relief against Double Taxation* (Referred by the Government of India).

III. IMMUNITIES AND PRIVILEGES OF THE COMMITTEE

INTRODUCTORY NOTE

At the First Session of this Committee held in New Delhi, in April 1957, opinions were expressed that the Committee as an Inter-Governmental Organisation should have certain immunities and privileges in the territories of the participating States. It was also felt that the representatives of the member States attending the Sessions of the Committee as well as the Committee's Secretary and the members of the Secretariat should enjoy the immunities and privileges admissible to the participants in the meetings of the other international organisations and members of their Secretariat. The Committee accordingly directed its Secretariat to prepare the background material in this connection for consideration at its Second Session.

At its Second Session held in Cairo, in October 1958, the Committee provisionally drew up a set of Draft Articles on the subject which were submitted to the Governments of the member States for comments. As some of the Governments expressed the view that the immunities and privileges in the Cairo draft went in certain respects beyond those that are normally given to similar Inter-Governmental Organisations, the Committee at its Fifth Session held in Rangoon in 1962 appointed a Sub-Committee to prepare an alternative draft for consideration of the Committee. The draft prepared by the Sub-Committee was transmitted to the Governments of the participating countries for their comments. The provisions of the draft were acceptable to the Governments of India, Pakistan, Burma, Ceylon and Iraq whilst Japan, Indonesia and the United Arab Republic suggested certain changes.

The Committee at its Sixth Session considered the draft prepared by the Sub-Committee appointed at its Fifth Session in the light of the comments made by the Governments. The Committee was able to finalise the provisions on the subject and has recommended to the Governments that they be implemented by taking appropriate measures.

IMMUNITIES AND PRIVILEGES OF THE ASIAN-AFRICAN LEGAL CONSULTATIVE COMMITTEE AS ADOPTED BY THE COMMITTEE AT ITS SIXTH SESSION

ARTICLE I

Privileges and immunities are accorded under this Instrument not to benefit individuals, but to ensure the efficient performance of the functions of the Committee. Consequently, the Committee and the participating Governments have not only the right but also a duty to waive the immunity in any case where in their opinion the immunity would impede the course of justice and where it can be waived without prejudice to the purpose for which the immunity is accorded.

ARTICLE II

Juridical Personality

The Committee shall possess juridical personality and shall have the capacity to contract, to acquire and dispose of immoveable and moveable property and to institute legal proceedings in its name.

ARTICLE III

Property, Funds and Assets

(a) The Committee, its property and assets, wherever located and by whomsoever held, shall enjoy immunity from every form of legal process, except insofar as in any particular case the Committee has expressly waived its immunity. It is, however, understood, that no waiver of immunity shall extend to any measure of execution.

(b) The Committee, its property and assets as also its archives shall be inviolable and shall be immune from search, requisition, confiscation, expropriation and any other form of interference whether by executive, administrative, juridical or legislative action in any of the participating countries. The premises occupied by the Committee for its Secretariat shall be likewise inviolable and immune from search provided the said premises are solely used for the purposes of the Committee.

(c) The Committee shall be immune from the regulations relating to exchange control in the matter of holding or transfer of its funds from one participating country to another. In exercising this right, the Committee shall pay due regard to any representations made by the Government of any participating country, insofar as it is considered that effect can be given to such representations without detriment to the interests of the Committee. However, the Committee shall not take out of any participating country more than what the Committee has brought in.

(d) The Committee, its assets, income and other property, whether owned or occupied by it, shall be exempt from all direct taxes; it is understood, however, that the Committee will not claim exemption from taxes which are in fact no more than charges for public utility services.

(e) The Committee shall be exempt from payment of customs duty as also prohibitions and restrictions on imports and exports of articles or publications imported or exported by it for its official use. It is understood that articles imported under such exemption will not be sold in the country to which they are imported, except under such conditions as have been agreed upon with the Government of that country, which in any case shall not exceed those extended to similar inter-governmental organisations.

ARTICLE IV

Facilities in respect of Communications

(a) The Committee and its Secretariat shall enjoy in each of the participating countries freedom of communication and no censorship shall be applied to the official correspondence of the Committee certified as such and bearing the official seal of the Committee.

(b) Nothing in this article shall be construed to preclude the adoption of appropriate security precautions to be determined by agreement between the participating Governments and the Committee.*

* The Delegate of Indonesia reserved his position on Article IV(b).

Article V

Representatives of the Participating Countries, Observers and the Secretary of the Committee

1. Representatives of the participating countries designated as Members, Alternate Members and Advisers as also Observers and the Secretary or the Acting Secretary of the Committee shall, during their stay in the country in which the Session of the Committee is held and also during their journey to and from that country, enjoy the following:—

(a) Immunity from personal arrest or detention and from seizure of the personal baggage and immunity from legal procedure in respect of words spoken or written and all acts done by them in their official capacity;

(b) Inviolability of all papers and documents;

(c) The right to receive papers or correspondence in sealed covers;

(d) Exemption in respect of themselves and their spouses from immigration restrictions, aliens registration or national service obligations in the country in which the Session of the Committee is held and in the participating countries through which they are in transit for the purpose of attending the Session of the Committee;

(e) The same facilities in respect of currency or exchange restrictions as are accorded to temporary diplomatic missions;

(f) The same immunities and privileges in respect of their personal baggage as are accorded to diplomatic agents. The words 'personal baggage' in this section shall not be interpreted to include an automobile and other means of transportation. Personal baggage shall not, however, be sold in the country in which the Session of the Committee is held without an express authorisation from the Government of that country;

(g) Such other privileges and immunities and facilities not inconsistent with the foregoing as the diplomatic agents enjoy, except that they shall have no right to claim exemption from customs duties on goods imported

(otherwise than as part of their personal baggage) or from excise duties or sales-taxes;

Provided always that the immunities specified in the foregoing clauses can be waived in any individual case in regard to a member of the delegation, by the Government of the participating country which the individual represents.

2. The provisions of Article V are not applicable as between a representative and the authorities of the country of which he is a national or of which he is or has been the representative.

3. Where the incidence of any form of taxation depends upon residence, the periods, during which the representatives of participating countries to the Committee and to conferences convened by the Committee are present in a participating country for the discharge of their duties, shall not be considered as periods of their residence.

Article VI

Officials of the Secretariat

1. Officials of the Committee shall:

(a) Be immune from legal process in respect of words spoken or written and all acts performed by them in their official capacity;

(b) Enjoy the same exemptions from taxation in respect of the salaries and emoluments paid to them by the Committee and on the same conditions as are enjoyed by officials of the United Nations.

(c) Be immune, together with their spouses and relatives dependent on them, from immigration restrictions and aliens registration;

(d) Be accorded the same privileges in respect of exchange facilities as are accorded to officials of comparable rank of diplomatic missions;

(e) Be given, together with their spouses and relatives dependent on them, the same repatriation facilities in time of international crises as officials of comparable rank of diplomatic missions;

(f) Have the right to import free of duty furniture and

effects within one year of the time when they first take up their posts in the country in question; the term "effects" in this section shall not be interpreted to include an automobile or other means of transportation;

(g) Be exempt from national service obligations.

2. The immunities and privileges except those specified in clause 1(a) above shall not be applicable to the nationals of the country in question unless expressly extended by the participating country.

3. The Secretary of the Committee, with the approval of the Committee, shall communicate to the Governments of participating countries the categories of the officials to whom the provisions of this Article shall apply.

4. The immunities specified in the foregoing clauses can be waived in any individual case, in regard to an official of the Secretariat by the Secretary of the Committee, and in case of the Secretary, by the Committee itself.

5. The Committee shall cooperate at all times with the appropriate authorities of participating countries to facilitate the proper administration of justice, secure the observance of police regulations and prevent the occurrence of any abuses in connection with the privileges, immunities and facilities mentioned in this Article.

Article VII

Settlement of Differences

If any participating country considers that there has been an abuse of any privilege or immunity conferred by this Instrument, consultations shall be held between that country and the Committee to determine whether any such abuse has occurred, and if so, to attempt to ensure that no repetition occurs.

IV. DUAL NATIONALITY

INTRODUCTORY NOTE

The subject of Dual Nationality was referred to the Committee by the Government of the Union of Burma under the provisions of Article 3(b) of the Statutes of the Committee. The Governments of Burma, Japan and the United Arab Republic submitted memoranda on the subject and the United Arab Republic also presented a Draft Agreement for consideration of the Committee.

During the First Session held in New Delhi, the Delegations of Burma, Indonesia and Japan made brief statements on the problem of dual nationality but the Committee decided to postpone further consideration of the subject as the Delegations of India, Ceylon, Iraq and Syria had reserved their position on this subject.

During the Second Session held in Cairo, the views of the Delegations were ascertained on the basis of a questionnaire prepared by the Secretariat. The main topics discussed during the Second Session were: (1) the acquisition of dual nationality; (2) the position of a resident citizen who is simultaneously a citizen of another State and the rights of such a citizen; (3) the position of a non-resident citizen possessing dual nationality; and (4) the position of an alien possessing dual nationality. The Delegations were of the opinion that it would be desirable to reduce the number of cases of persons possessing dual nationality by means of enacting suitable national legislation or by concluding international conventions. It was, however, felt that unless there was uniformity in nationality laws and unanimity on the fundamental principles of nationality, it would be very difficult to achieve the desired objective by means of a multilateral convention. The Committee decided that the Secretariat should prepare a report on the subject on the basis of the discussions held during the session and that this report together with the draft agreement submitted by the United Arab Republic should be taken up for consideration during the Third Session.

At the Third Session held in Colombo, the Committee had a general discussion on the subject, and the unanimous view of the Delegations was that some preparatory work should be done by the governments of the participating countries on the basis of the

report of the Secretariat before the Committee could finally make its recommendations on the subject. The Committee therefore decided to request the governments of the participating countries to study the report of the Secretariat and the Draft Agreement submitted by the Delegation of the United Arab Republic and to communicate their views to the Secretariat in the form of memoranda indicating particular problems which have arisen in this regard and suggesting specific points which they desire the Committee to take up for particular study and consideration.

At the Fourth Session held in Tokyo, the Committee gave further consideration to the subject and decided to request the Delegation of the United Arab Republic to prepare a revised draft of a convention in the light of the comments received from the governments of the participating countries for consideration at the Fifth Session of the Committee. The Committee also directed the Secretariat to request the governments which had not given their comments to do so as early as possible and thereafter to forward the comments on to the Delegation of the United Arab Republic.

At the Fifth Session held in Rangoon in January 1962, the subject was fully considered by the Committee on the basis of a draft of an Agreement submitted by the Delegation of the United Arab Republic. The Committee also had before it written memoranda on the subject submitted by the Governments of Burma, Ceylon, Indonesia, Iraq and Japan. After a detailed discussion on the various aspects of the subject the Committee adopted a preliminary report containing the draft Articles embodying principles relating to the elimination or reduction of dual or multiple nationality.

At the Sixth Session of the Committee held in Cairo in 1964, the subject was finally discussed on the basis of the preliminary report adopted at the Fifth Session and the comments received thereon from the Delegates. The Committee drew up and adopted its Final Report containing Model Rules embodying principles relating to elimination or reduction of dual or multiple nationality. It was decided to submit the Final Report to the Government of Burma and the Governments of the other countries.

FINAL REPORT OF THE COMMITTEE ADOPTED AT THE SESSION

Model articles embodying principles relating to elimination or reduction of dual or multiple nationality

*GENERAL PROVISIONS**

ARTICLE 1

It is for each State to determine under its own law who are its nationals. This law itself shall be recognised by other States in so far as it is consistent with international conventions, international customs, and the principles of law generally recognised with regard to nationality.

Note: The Delegate of Thailand stated that with the exception of the principle of compulsory recognition he accepted the other principles incorporated in this Article.

ARTICLE 2

Questions as to whether a person possesses the nationality of a particular State shall be determined in accordance with the law of that State.

Note: The Delegate of India reserved his position on this Article.

ARTICLE 3

Alternative (A)

For the purpose of these Model Articles the age of majority of a person shall be determined according to the law of the State the nationality of which is to be acquired, retained, or renounced.

Alternative (B)

The age of majority shall be determined according to the laws of the State, the nationality of which is relevant for the matter under consideration, provided that for the purposes of Articles 5 and of Article 7, the majority age (in the event of any conflict of

*As regards Dual Nationality, the Delegation of Pakistan stated that the Government of Pakistan recognises no second nationality in a citizen except that in the United Kingdom; a citizen of Pakistan has all the rights of a citizen of the United Kingdom including the right of vote. The Delegation of Ghana reserved the position of his Government on these Articles.

State laws) shall be the majority age under the law of the State which prescribes a higher age.

Note: The Delegates of Burma, Thailand and the United Arab Republic accepted Alternative (A) of Article 3. The Delegates of Ceylon and India accepted Alternative (B) of Article 3. The Delegate of Thailand saw no objection to Alternative (B). The Delegates of Japan and Indonesia reserved their position on this Article.

Nationality of Married Women

Article 4

(1) If a woman who is a national of one State marries a national of another State, or if a husband acquires a nationality other than that he had on the date of marriage, the nationality of the wife shall not be affected.

(2) Nevertheless if she, in either of such cases, voluntarily acquires the nationality of her husband, she loses *ipso facto* the other nationality.

Note: The Delegate of Thailand whilst accepting clause (1) of this Article wished it to be understood that this principle would also apply in the case of a husband acquiring an additional nationality. The Delegate of India wished that the words, "unless she has already renounced her original nationality" to be added at the end of clause (2) of this Article.

Nationality of Children

Article 5

(1) A minor follows ordinarily his father's nationality. If the minor is born out of wedlock, or if the nationality of his father is unknown or if his father has no nationality, he follows his mother's nationality.

(2) Nevertheless, if a minor born to a national of one State in another State is deemed in accordance with the laws of each of the two States to be its national, he should opt for one of these two nationalities within one year from the date of attaining his majority age in accordance with the provisions of Article 7.

Note: The Delegates of Ceylon and India accepted only the first sentence of clause (1) of this Article. The Delegate of Ceylon could not accept the second sentence of clause(1) of this Article in view of the inclusion in it of reference to the case of a minor whose father is stateless. The Delegate of India preferred the omission of the second sentence

but expressed the view that the principle of nationality of the State of birth instead of the principle of mother's nationality should be adopted. The Delegates of Burma and Thailand accepted the provisions of clause (2) of this Article. The Delegates of Ceylon, India and the United Arab Republic were in agreement that clause (2) of this Article was not necessary. The Delegate of Indonesia reserved his position on clause (2) of this Article. The Delegate of Japan reserved his position on paragraph (2) of Article 5 of the draft.

Adoption

Article 6

In case of valid adoption, the adopted minor shall follow his adopter's nationality.

Note: The Delegates of Burma, Indonesia and the United Arab Republic accepted this Article. The Delegates of Indonesia and the United Arab Republic took the view that the minor should have an option after he attains majority to choose between his original nationality and the nationality of his adopter. The Delegate of Thailand stated that the words "be entitled to" should be inserted between the word "shall" and the word "follow". This Article was not accepted by the Delegates of Ceylon, India and Japan.

Option

Article 7

A person who knows that he possesses two nationalities acquired without any voluntary act on his part should renounce one of them in accordance with the law of the State whose nationality he desires to renounce, within twelve months of his knowing that fact or within twelve months of attaining his majority age, whichever is the latter.

Note: The Delegates of Burma, Ceylon, India Thailand and the United Arab Republic accepted this Article. The Delegate of Indonesia reserved his position on this Article although he expressed the view that the option available to the individual must be of obligatory character and that States should by means of agreement provide for dealing with cases where the individual does not exercise the option. The Delegate of Japan was not in favour of imposing any obligation on an indivdual to exercise the option.

Active Nationality

Article 8

A person having more than one nationality shall be treated as having only one nationality in a third State. A third State should,

however, recognise exclusively the nationality of the State in which he is habitually and principally resident or the nationality of the State with which in the circumstances he appears to be in fact most closely connected.

ARTICLE 9

A person possessing two or more nationalities of the contracting States, who has his habitual and principal residence within the territory of one of these States with which he is in fact most closely connected, shall be exempt from all military obligations in the other State or States.

Note: The Delegate of Iraq reserved his position on this Article.

ARTICLE 10

Without prejudice to the provisions of Article 9, if a person possesses the nationality of two or more States, and under the law of any one of such States has the right, on attaining his majority age, to renounce or decline the nationality of that State, he shall be exempt from military service in such State during his minority.

Note: The Delegates of Indonesia and Iraq reserved their position on this Article.

Explanatory Note: These Articles are intended to serve only as model rules as embodying certain Principles relating to elimination or reduction of Dual or Multiple Nationality. The provisions of each of the above Articles are independent of each other.

V. THE LEGALITY OF NUCLEAR TESTS

INTRODUCTORY NOTE

The subject of The Legality of Nuclear Tests was referred to the Committee by the Government of India under Article 3(c) of the Statutes as being a matter of common concern to the member States of the Committee.

At its Third Session held in Colombo in 1960, the Committee decided to take up this subject for consideration and directed the Secretariat to collect background material and information on the subject including such scientific data as might be available and to place the same before the Committee at its Fourth Session.

At the Fourth Session held in Tokyo in 1961, the Committee considered the subject on the basis of a report prepared by the Secretariat. After a general discussion, the Committee decided to take up the question for fuller consideration at its next Session. The Committee also decided that it would limit itself to the question of the legality of nuclear tests in time of peace.

At the Fifth Session held in Rangoon in 1962, the subject was discussed further on the basis of a revised note prepared by the Secretariat in accordance with the decision taken by the Committee at its Fourth Session. The Committee heard the viewpoints on the various topics on the subject from the Delegations of the participating States present at that Session. A Draft Report was also prepared on the basis of the discussion at the Fifth Session which was submitted to the member States for their comments.

At the Sixth Session of the Committee held in Cairo in 1964, the subject was finally considered on the basis of the Draft Report and comments received from member Governments thereon. The Committee drew up its final conclusions on the subject unanimously.

FINAL REPORT OF THE COMMITTEE ADOPTED AT THE SESSION

The Asian-African Legal Consultative Committee at its Third Session held in Colombo in January 1960 decided to take up for consideration the question of Legality of Nuclear Tests, a subject which had been suggested by the Government of India under Article 3(c) of the Statutes of the Committee, being a legal matter of common concern to all the States participating in the Committee.

At its Fourth Session held in Tokyo in February 1961, the Secretariat of the Committee presented before it the relevant material both from the scientific and legal points of view, which formed the basis of discussion at that session. After a general discussion the Committee decided to study the matter further and to take up the question for fuller consideration at its Fifth Session. The Committee decided that it would not concern itself with the question regarding the use of nuclear weapons in time of war, but that it would confine itself to an examination of the problem of the legality of nuclear tests in time of peace.

In accordance with the decision taken by the Committee at its Tokyo Session, the Secretariat prepared a report which was placed before the Committee at its Fifth Session held in Rangoon in January 1962, on the basis of which the matter was further considered.

The Committee heard the views and expressions of opinion on the various topics arising on this subject from the Members for Burma, Ceylon, India, Indonesia, Japan, Pakistan, Thailand, and the United Arab Republic. Thereafter further comments were submitted by member governments.

At the Sixth Session of the Committee held in Cairo in February-March 1964, the Committee considered the report prepared by the Secretariat and the comments received from Governments. The Committee took into account the various United Nations resolutions and international agreements relevant to the subject and the scientific data placed before the Committee. It also noted with satisfaction the conclusion of the Treaty of 5th August 1963 prohibiting nuclear tests, which has had a considerable effect upon the ultimate outcome of the Committee's deliberation.

The Committee has formulated the following conclusions, stating that they apply equally to test explosions of nuclear weapons carried out by anyone for whose action the State is responsible in international law;

Conclusions

1. As sufficient evidence regarding the harmful effects of the underground test explosions of nuclear weapons is not at present available to the Committee, the Committee is unable at this stage to express any opinion on the legality or otherwise of such test explosions. The conclusions hereinafter set out are therefore referable to all test explosions of nuclear weapons other than underground test explosions.

2. Scientific evidence examined by the Committee shows that every test explosion of nuclear weapons results in widespread damage, immediate or delayed, or is capable of resulting in such damage; the present state of scientific knowledge does not indicate that the harmful effects of such test explosions can reasonably be eliminated. Such test explosions not only cause direct damage, but pollute the atmosphere and cause fall-out of radioactive material and also increase atomic radiation, which are detrimental to the well-being of man and also affect future generations.

3. Having regard to its harmful effects, as shown by scientific data, a test explosion of nuclear weapons constitutes an international wrong. Even if such tests are carried out within the territory of the testing State, they are liable to be regarded as an abuse of rights (*abus de droit*).

4. The principle of absolute liability for harbouring dangerous substances or carrying on dangerous activities is recognised in international law. A State carrying out test exlosions of nuclear weapons is therefore absolutely liable for the damage caused by such test explosions.

5. Test explosions of nuclear weapons are also contrary to the principles contained in the United Nations Charter and the Declaration of Human Rights.

6. Test explosions of nuclear weapons carried out in the high seas and in the airspace there above also violate the principle of

the freedom of the seas and the freedom of flying above the high seas, as such test explosions interfere with the freedom of navigation and of flying above the high seas and result in pollution of the water and destruction of the living and other resources of the sea.

7. Test explosions of nuclear weapons carried out in trust territories and non-self governing territories also violate Articles 73 and 74 of the United Nations Charter.

VI. OTHER DECISIONS OF THE COMMITTEE

Rights of Refugees

This subject has been referred to the Committee by the Government of the United Arab Republic under Article 3(b) of the Statutes. At the Sixth Session of the Committee it was taken up for consideration on the basis of a preliminary study prepared by the Secretariat and the legal issues listed in a memorandum furnished by the Government of the United Arab Republic. The United Nations Deputy High Commissioner for Refugees, who attended the Session in the capacity of an Observer, presented a memorandum and was invited to address the Committee.

The Committee after a general discussion on the subject decided that the governments of the participating countries be requested to send their comments on the subject together with the texts of constitutional provisions, laws and practice, particularly on the issues of compensation, the minimum standard of treatment of a refugee in the State where he has been admitted, and also on the question of constitution of competent international tribunals for determination of compensation that could be claimed by a refugee. It directed the Secretariat to prepare a fresh report on the basis of the materials which may be received from the the participating governments and from other sources and to place the same before the next Session.

U.N. Charter from Asian-African Viewpoint

The subject of U.N. Charter from Asian-African Viewpoint has been referred to the Committee by the Government of the U.A.R. under Article 3(b) of the Statutes with the request that the Committee might examine the provisions of the Charter from the legal point of view taking into account in particular the changed composition of the United Nations after the admission of the newly independent Asian African States. The subject was considered on the basis of the memoranda submitted by the Governments of India and the U.A.R. and the preliminary study made by the Secretariat of the Committee. The Delegations present at the Session made statements expressing their views.

The Committee noted with satisfaction the adoption of the two resolutions by the General Assembly on the question of equit-

able representation in the Security Council and the Economic and Social Council and recommended to the participating States to ratify not later than 1st September 1965 the amendments set out in the aforesaid resolutions. The Committee also made an appeal to all Member States of the United Nations to ratify not later than 1st September 1965 the said amendments. It was decided to transmit the Resolution of the Committee to the United Nations Secretariat for bringing it to the attention of the Member States of the United Nations. The Committee directed the Secretariat to compile further material on the subject and to place the same before the next Session.

Relief against Double Taxation

The subject relating to Relief against Double Taxation was referred to the Committee by the Government of India under the provisions of Article 3(c) of the Statutes of the Committee for exchange of views and information between the participating countries. The Committee took up the subject for consideration at the Fourth Session and appointed a Sub-Committee to examine in what manner the Committee should treat the problem of avoidance of double taxation and fiscal evasion. The Sub-Committee fully discussed the subject on the basis of a general note prepared by the Secretariat of the Committee. The Committee, accepting the recommendations of the Sub-Committee, decided that the Secretariat should request the Governments of the participating States to forward to the Secretariat the texts, if any, of agreements for avoidance of double taxation and fiscal evasion concluded by them and the texts of the provisions of their municipal laws concerning the subject. The Committee also directed the Secretariat to draw up the topics of discussion (questionnaire with short comments) and to send it to the governments of the participating countries.

At the Sixth Session of the Committee, the subject was taken up for further consideration and a Sub-Committee was appointed to go into the question. The Sub-Committee received a memorandum from the U.A.R. Delegation and also a note from the Delegation of Ceylon containing its supplementary answers to the U.N. Questionnaire on Double Taxation. The Sub-Committee after a preliminary exchange of views concluded that though bilateral double taxation agreements provided a practical solution

to the financial problems which arose from the economic intercourse of nations, the conclusion of a multi-lateral convention may be desirable. The Sub-Committee felt that it was necessary for this purpose to have an exchange of views on the techniques employed by the participating States, their experiences and practices. Since the views of some of the participating countries were not before the Sub-Committee, it recommended to the Committee to postpone consideraton of this question until the next Session and to direct the Secretariat meanwhile to complete the compilation of rules, regulations and State practice of the participating States and the agreements concluded by them.

Reciprocal Enforcement of Judgments, Service of Process, and Recording of Evidence in Civil and Criminal Cases

The subject of Reciprocal Enforcement of Judgments has been referred to the Committee by the Government of Ceylon under Article 3(b) of the Statutes with a view to consider drawing up of a convention or multilateral treaty which will permit the reciprocal enforcement of a foreign judgment in each other s territories. At the Sixth Session of the Committee, the subject was taken up for consideration on the basis of a comprehensive note prepared by the Secretariat and the memoranda received from the Delegations of Ceylon and the U.A.R. A Sub-Committee appointed on the subject after studying the question fully submitted a report to the Committee recommending two draft conventions, one on the reciprocal enforcement of judgments and the other on the service of process. The Committee took note of the Report of the Sub-Committee and decided to give detailed consideration to the Report at the next Session.

Vienna Conventions

The Government of India by a reference under Article 3(b) of the Statutes had requested the opinion of the Committee on certain questions relating to the Vienna Convention on Diplomatic Relations, 1961, the Vienna Convention on Consular Relations, 1963, and the Vienna Convention on Nuclear Damage, 1963. These questions are:

(1) To what extent are the provisions of these Conventions acceptable to the Government of your country?

(2) Are there any provisions in these three Conventions which the Government of your country does not approve? If so, what are the reasons?

(3) Does the Government of your country propose any revision or modification of any of the provisions of these three Conventions? If so, what are the reasons?

(4) Does the Government of your country suggest any additional provisions to these three Conventions? If so, what are the reasons?

(5) Does the Government of your country propose to ratify or accede to all or any of these Conventions? If so when?

(6) Are there any bilateral or multilateral treaties between the Government of your country and the governments of any other countries on the subject matter of these three Conventions? If so, what would be the position of these treaties, if the Government of your country ratifies or accedes to these Conventions?

The Committee after a general discussion on the subject resolved that the Governments of the participating countries be requested to give their comments on these questions within a period of six months in respect of the Conventions on Diplomatic and Consular Relations, and within a period of nine months in respect of the questions pertaining to the Vienna Convention on Nuclear Damage. It directed the Secretariat to prepare a report on the subject within two months after the receipt of the comments from these governments for circulation. The Committee also decided that the subject be placed on the agenda of the Seventh Session, if so requested by any of the participating countries.

Report on the Work Done by the International Law Commission at its Fifteenth Session

During its Fifteenth Session held from 6 May to 12 July 1963, the International Law Commission had considered *inter alia* the subjects of Law of Treaties, Question of Extended Participation in General Multilateral Treaties concluded under the auspices of the League of Nations, State Responsibility, Succession of States and Governments, and Special Missions. Dr. H. W. Tambiah,

the Member for Ceylon on the Committee, who had represented the Committee at the Fifteenth Session of the Commission, submitted his report under clause 5(a) of Rule 6 of the Statutory Rules on the work done by the Commission at that session. The Committee expressed its appreciation for the services rendered by Dr. Tambiah in representating the Committee at the Commission's Session and for presenting his valuable report. The Committee generally considered the report and decided that the Secretariat of the Committee should prepare a study on the Law of Treaties including the question of accession to general multilateral conventions concluded under the auspices of the League of Nations and particularly on the specific questions raised by the Delegates in the course of discussions at the Session. The Committee further decided to request the participating countries to communicate their views on the Draft Articles on the Law of Treaties prepared by the Commission so that they may be incorporated in the study to be prepared by the Secretariat. It directed the Secretariat to attach priority to this topic and place the same on the agenda of the next Session. The Committee further directed the Secretariat to collect materials on the Law of State Succession and prepare a report on the subject.

THE LEGALITY OF NUCLEAR TESTS

REPORT OF THE

COMMITTEE AND BACKGROUND MATERIAL

I. *INTRODUCTORY*

The Prime Minister of India in his inaugural address at the First Session of this Committee, held in New Delhi in April 1957 drew the attention of the jurists of the world to the fact that nuclear tests were being carried out and continued by various powers in different parts of the world. He posed the question as to whether such tests, which according to all scientific evidence had harmful effects on the well-being of peoples of the world, could be justified from the point of view of International Law. As this question had not been considered adequately by any body of jurists or by any of the well known authorities on International Law and having regard to the fact that the nuclear tests were being carried out in parts of Asia and Africa in spite of protests from the peoples of these Continents, this Committee at the suggestion of the Government of India decided at its Third Session, held in Colombo in January 1960, to undertake a study of the question of legality of nuclear tests as being a matter of common concern among the participating countries. The Committee directed the Secretariat to collect background material and information on the subject, including scientific data as may be available, and to place the same before the Committee at its Fourth Session.

At the Fourth Session held in Tokyo in February 1961, the Committee considered the subject on the basis of a study prepared by the Secretariat. The Delegates of the United Arab Republic, India, Ceylon, Indonesia, Iraq, Japan, Burma and Pakistan stated their points of view on the question of legality of nuclear tests, indicating at the same time the scope of the subject and the basic principles on which further material had to be collected. The Committee also heard statements from the Observer for Ghana and MR. F. V. GARCIA-AMADOR, Member of the International Law Commission, in his personal capacity as a recognised expert. Indicating the scope of the subject which the Committee had to consider, the Member for India pointed out that the Committee was not concerned with the controversial and debatable question of legality of the use of nuclear weapons in time of war, but was concerned with the question of legality of nuclear tests in time of peace. The question for consideration in his view was: Are nuclear tests conducted by a country within its territory or else-

where, which are likely to cause harm to inhabitants of other countries, permissible according to International Law? The Committee, in his view, was concerned with considering whether any known or accepted principles of International Law could be applied to the situation arising out of these tests. If the existing principles were inapplicable or inadequate, the Committee would have to consider whether International Law, which had in the past met new situations by evolving new principles, could not in the present case similarly attempt to counter the grave threat to which States were exposed by these tests by formulating a suitable doctrine with new principles to meet the new situation. The representatives of other participating countries concurred in this approach to the problem and the Committee decided that it would confine itself to an examination of the problem of legality of nuclear tests in time of peace. The Committee further decided that the Secretariat of the Committee should continue its study of this subject and prepare a report for the consideration of the Committee at its Fifth Session.

At the Fifth Session held in Rangoon in January 1962, the subject was fully discussed by the Committee on the basis of the materials on the scientific and legal aspects of nuclear tests collected by the Secretariat of the Committee. The Governments of Japan and the United Arab Republic submitted written memoranda on the subject. The Committee heard the viewpoint and expressions of opinion on the various topics on this subject from the Delegations of Burma, Ceylon, India, Indonesia, Japan, Pakistan, Thailand and the United Arab Republic. The Committee also heard statements from the Observers for Ghana, Laos and the Philippines, and the representative of the League of Arab States. DR. RADHABINOD PAL, President of the International Law Commission, in his personal capacity as an expert, and DR. OSCAR SCHACHTER in his personal capacity, also made a few remarks.

The Committee considered the question on the basis of the scientific information on the effects of such tests including the material contained in the Reports of the United Nations Scientific Committee on the "Effects of Atomic Radiation", the Reports of the British Medical Research Council on the "Hazards to Man of Nuclear and Allied Radiations" and the Reports of Japanese Scientists on the "Effects and Influences of Nuclear Bomb Test

Explosions." Indicating the scope of the discussion, the President of the Committee, MR. M. C. SETALVAD, again pointed out that the Committee was not concerned with the question of the use of nuclear weapons in time of war, but only with the question of the legality of nuclear tests in time of peace. The President drew the attention of the Committee to the Topics for Discussion prepared by the Secretariat and the Committee discussed the subject on the basis of the following questions:—

I. (a) Is a State responsible or ought it to be so for direct damages caused to the inhabitants of the area where the tests are carried out due to deaths of human beings and destruction of their property resulting from explosions of atomic devices under the law of tort or principles analogous thereto?

(b) If such damage is caused to a foreign national resident or sojourning in its territory or to one who may be accidentally passing through the danger area, would the State which is carrying out the tests be liable to pay reparation to the injured alien's home State under the principles of State Responsibility in International Law?

(c) If such damage is caused to a foreign national whilst resident or sojourning in a neighbouring State, would the State carrying out the test be held liable to pay reparation to the injured person's home State under principles analogous to that of State Responsibility in International Law?

II. (a) Can it be said that a State which carries out atomic tests in its own territory is endangering the safety and well-being of its neighbouring States and their inhabitants due to possibilities of radioactive fall-out; and if so, whether the use by a State of its own territory for such purposes is not contrary to the principles of International Law?

(b) Can it be said that the use by a State of its own territory for the purpose of carrying out nuclear tests by explosion of atomic devices amounts to an abuse of its rights in respect of use of its State territory?

III. (a) If it is established that explosion of nuclear devices results in pollution of the air with radioactive substance and that such contaminated air is injurious to the health of the peoples of the world, would the State carrying out the test be said to be res-

ponsible for an international tort in accordance with the principles laid down in the *Trail Smelter Arbitration* case?

(b) In an action based on commission of an international tort, would it be necessary for the claimant State to prove actual damage, or is the general scientific and medical evidence on the effects of nuclear explosions sufficient to maintain the action?

(c) Even if the harmful effect resulting from contamination of the air can be confined within the territories of the particular State, can it be said that the State has violated the human rights of the citizens and aliens living in its territory, and if so, whether the State is responsible for the harm caused to the aliens under the principles of International Law relating to State Responsibility?

IV. Is the use of atomic weapons in a war illegal, and if so, can the tests carried out for the purpose of manufacture and perfection of such weapons be said to be illegal *per se* without proof of any damage? Can the question of stoppage of such tests be said to be a matter of international concern?

V. Would the payment of damages by a State for injuries suffered due to nuclear tests be regarded as sufficient or should an injunction for stoppage of such tests be necessary?

VI. Does the interference with the freedom of the air or the sea navigation resulting from declaration of danger zones over the areas where the tests may be carried out amount to violation of the principles of International Law?

VII. Is the destruction of living resources of the sea which result from nuclear tests on islands or areas of the high seas to be regarded as violative of the principles of International Law?

VIII. Is it lawful for an administering authority to use territories, which it holds on trust from the United Nations, for purposes of holding nuclear tests?

The Delegates expressed their views on the above questions and on the basis of these discussions the Secretary of the Committee prepared and presented a Draft Report on the subject for the consideration of the Committee. After a general discussion, the Committee decided that the Secretariat should submit the Draft Report on Legality of Nuclear Tests to the Governments of the

participating countries for their comments and that the subject should be placed before the next session of the Committee as a priority item on the agenda.

At the Sixth Session of the Committee held in Cairo in 1964, the subject was finally considered on the basis of the Draft Report and comments received from member governments thereon. The Committee drew up its final conclusions on the subject unanimously.

II. STATEMENTS OF DELEGATES AND OBSERVERS

Made at the Fourth Session

U.A.R.:—In 1945 two atomic bombs were exploded in Japan. France, more recently, has exploded three nuclear bombs in the Sahara which lies in the heart of Africa.

There can be no doubt at all that nuclear and thermonuclear explosions, whether in the air or on the ground or in the sea, produce fall-out, blast, heat and radiation which entail physical and biological effects very harmful to mankind. The nuclear explosions over Japan in 1945 brought with them widespread destruction to lives and properties within wide areas. The radiation effects of these nuclear explosions were responsible for about 12 – 15 per cent of the casualties inflicted in the range of blast and heat flash. With the development of thermonuclear explosions the damage would extend over immense areas.

Apart from the contamination of the environment and the hazards arising from local fall-out, the serious danger caused by nuclear explosions would be the global contamination of the atmosphere and the global fall-out. Although nuclear tests may be conducted in deserted areas and under worked up precautions in order to avoid the exposure of people to local fall-out, yet nothing can be done to avoid exposing, almost the entire world population, to global fall-out resulting from a large explosion. This global fall-out is inherent in the very nature of nuclear tests, particularly multi-megaton tests, and it cannot be eliminated. It is a long-term hazard; its short-term effects are not the only risk.

We shall not go into detail about the consequences of the global fall-out and its hazards. Scientists add to its internal hazard to the human body the hazard from radio-strontium. The risk of introducing strontium-90 in the atmosphere could be colossal to the future of humanity. Scientists have already explained its biological damage, its relation with diseases (leukaemia, bone tumors, cancer), and its effects in the reduction of life span and its genetic effects.

Apart from the damage caused by radiation, nuclear explosions have the following serious economic effects:

(a) The possibility of mass movement of the population and of deprivation of their means of livelihood.

(b) The effect on weather and rain.

(c) The destruction of the living resources of the seas.
(d) The interference with the freedom of air navigation and navigation in the high seas.

It is appropriate to mention now the effects of the three nuclear tests conducted by France in the African Sahara during the year 1960 on two African countries, i.e. Ghana and the U.A.R.

It was announced that Ghana suffered from the first atomic bomb which was exploded on February 13, 1960. An increase in radiation was found in the samples of research workers. Harvest, soil, water and even milk were badly affected.

The effects of the two other atomic bombs, which were exploded on the Ist April and the 27th December 1960, were obvious in the U.A.R. territory, although the place of explosion was 3,400 Km. to the west of Alexandria. It was stated in a report done by the Faculty of Science, Alexandria University, that the radiation increased and the radioactive fall-out resulting from the second explosion became on December 28, 1960 twenty times double the normal. The radioactive fall-out resulting from the third explosion is increasing gradually but it has not reached a serious point uptil now.

France has conducted these three nuclear tests in complete defiance of the resolution adopted by the General Assembly of the United Nations on November 23, 1958 which reads:

"The General Assembly,
Recognizing the anxiety caused by the contemplated tests in the Sahara among all peoples, and more particularly those of Africa:
1. Expresses its grave concern over the intention of the Government of France to conduct nuclear tests.
2. Requests France to refrain from such tests."

France, in addition to that, has ignored the agreement concluded between the United States of America, the Soviet Union, and the United Kingdom for the suspension of nuclear tests for a certain period.

We believe that nuclear and thermonuclear weapons are illegal. They are against the existing rules of International Law. There are many international instruments, such as the Declaration of St.

Petersburg of 1868, the Declaration of the Brussels Conference of 1874, the Convention of the Peace Conference of 1899 of the Hague, the Geneva Protocol of 1952 and the Geneva Convention of 1949 which were accepted by the majority of the different countries including the Great Powers. These instruments included specific prohibition of the use of poisonous weapons and gases and of weapons of mass destruction. The basic principle of international law agreed upon in these conventions is that the only legitimate objective of war is to defeat the enemy's military force. The destruction of life and property which goes beyond this objective is illegal. Nuclear- and thermonuclear weapons are against this basic principle of International Law because they are poisonous, they cause unnecessary suffering, and they are employed without any regard to the distinction between combatants and non-combatants.

Nuclear weapons are also against the principles of morality. Morality urges nations to stop exposing humanity to the dangers of nuclear radiation. The fear created by nuclear explosions is that of total destruction and no nation is morally allowed to spread such fear and anxiety among the peoples of the world. The principles of morality which are prevalent in a given society are indirect sources of its law in the sense that the content and meaning of its rules of law are influenced by those principles. In our interpretation of the rules of law governing nuclear explosions we could not forget the moral side of the problem.

Nuclear weapon tests are, in our opinion, illegal too even if conducted by a country either in its colonies or in trust territories or in its own territory. The illegality of nuclear tests conducted by a country in its colonies may be based on Articles 73 and 74 of the Charter of the United Nations. Article 73 reads:

"Members of the United Nations, which have or assume responsibilities for the administration of territories whose peoples have not yet attained a full measure of self-government, recognize the principle that the interests of the inhabitants of these territories are paramount, and accept as a sacred trust, the obligation to promote to utmost, within the system of international peace and security established by this Charter, the well-being of the inhabitants of these territories." Article 74 reads:

"Members of the United Nations also agree that their policy in respect of the territories to which this Charter applies, no less than in respect of their metropolitan areas, must be based on the general principle of good-neighbourliness, due account being taken of the interests and well-being of the rest of the world, in social, economic and commercial matters."

We believe that the aforementioned two Articles give specific rights to non-self-governing territories, and that these territories are no more under the complete sovereignty of colonial countries. The Members of the United Nations, having committed themselves to the respect of certain international standards in their relations with their colonies, no more, have the right to expose the peoples of these territories as well as of the neighbourhood to disasters by undertaking nuclear tests.

In regard to trust territories, we believe that under Chapter 12 of the Charter of the United Nations concerning trusteeship system as well as under the terms of trusteeship agreements, the trustee authority has no right to use the territories it holds, in trust from the United Nations, for the purpose of undertaking nuclear tests. Such an act from the trustee authority is against the basic objectives of the trusteeship system.

As regards nuclear tests undertaken by a State in its territory, we do believe that any State conducting nuclear weapon tests should be considered as committing a harmful illegal act directed, not only against the States neighbouring the centre of the explosion but also, against all countries of the world. This State would be consequently responsible for the damage inflicted on those States.

Since the nuclear weapons are illegal under the existing rules of international law, tests carried out for the manufacture and the perfection of these weapons should also be considered illegal.

It was argued that on the basis of national sovereignty, every country has the right to acquire nuclear weapons as a means of self-defence and maintaining its security. This concept is unacceptable.

It is a well known international rule that the responsibility of a State may become involved as the result of an abuse of a right enjoyed by virtue of international law. This occurs when a State

avails itself of its right in an arbitrary manner in such a way as to inflict upon another State an injury which cannot be justified by a legitimate consideration of its own advantage. According to this principle, nuclear tests should be considered illegal since these tests will undoubtedly entail risks and dangers to the peoples of other countries.

It has been suggested also that a State undertaking nuclear explosions could be considered responsible on the basis of the theory of risk. This theory has been recognized in the legislations of various countries and it should be adopted in international law.

Nuclear tests undertaken in the high seas are also illegal. According to the Law of the Sea, no State can exercise sovereignty over the high seas. In time of peace, freedom of navigation, freedom of fisheries, freedom to lay submarine cables and freedom of aerial movement, are co-related to the absolute rule of freedom of the seas. Nuclear tests on the high seas cause injurious effects upon fishing even outside the zone of immediate danger. Moreover, States undertaking nuclear tests in the high seas prohibit air navigation and sea navigation within the area where the tests are carried out. This act is an illegal interference with the freedom of air and of high seas and thus should be forbidden.

I should come now to a conclusion. I do believe that nuclear weapon tests should be wholly suspended, due to the dangers and risks entailed in the area of explosion, in the environment, and in the atmosphere. The abandonment of these tests is absolutely necessary for the benefit of humanity and for the non-interruption of our civilization.

Taking full account of the importance of the role of the Afro-Asian countries in international relations, I hope that our Committee shall adopt, in the present session, a resolution outlawing nuclear and thermonuclear tests and recommending the member States to continue and strengthen their efforts for the suspension of these tests, for the prohibition of nuclear and thermonuclear weapons bases in Africa and Asia and lastly for using nuclear energy for peaceful purposes only.

India:—In his inaugural speech, at the First Session of the Committee in April 1957, the Prime Minister of India had asked

whether tests in connection with the nuclear devices, which were being carried on by various powers and the effects of which had been established by scientific data to be harmful to mankind, were permissible according to international law. These tests have since continued. Scientific and medical opinion has, on the other hand, increasingly emphasized their evil effects as is evidenced by numerous recent publications. Indeed, 900 scientists from 43 contries are stated to have requested the United Nations to take steps to put an end to these tests. Realizing the grave importance and urgency of the subject from the point of view of the health and well-being of the peoples of the world, we decided at our last session to direct the Secretariat to prepare background material on this subject, so that we may be able to discuss it at this session. May I on behalf of our Delegation express our appreciation of the manner in which the Secretariat has discharged the task entrusted to it. Not only has it put before us a careful study from different points of view, but it has indicated in a detailed bibliography further sources which can be looked into for an adequate treatment of the subject.

It is essential at the outset to appreciate the scope of the subject which we have decided to discuss. We should, we think be clear that we are not concerning ourselves with the very controversial and much debated question of the legality of the use of nuclear weapons. That subject on which writers and students of international law have expressed divergent views is, we think, a wider and a different though a connected subject. That subject concerns the legality of the use of certain weapons and devices when fighting a war. What we are concerned with is a topic of much lesser scope. Are nuclear tests conducted by a country within its territory or elsewhere, which are likely to cause harm to inhabitants of other countries, permissible according to international law? We are, as I have already said, not concerned with the question of the legality of nuclear warfare; nor with the manufacture and possession of nuclear weapons. What we have decided to discuss is the carrying on of the nuclear tests by countries whether for military or peaceful purposes, in a manner which would endanger the health, life and property of the citizens of neighbouring or distant countries.

It may be said that it is difficult to isolate the question of the validity of nuclear tests from the larger question of the legality of

nuclear warfare. But would such a view be correct? A closer examination of the two problems reveals that their solutions depend on distinct legal principles. The question whether nuclear warfare is permitted by international law will have to be determined by ascertaining whether it is prohibited by any of the well accepted sources of international law, viz. customary international law, conventions or treaties entered into by States and the general principles of law recognized by civilized nations. On the other hand, the legality of the carrying out of nuclear tests in one's own territory, if such tests cause harm to persons outside the territory, will depend on the application of the rule of international customary law which imposes an obligation on a State "not to knowingly allow its territory to be used for acts contrary to the rights of other States". If the rule applies, the testing State will have committed an international tort and will be responsible to other States and persons for the consequences of its illegal action.

The distinction between the two problems—the legality of nuclear warfare and the legality of nuclear tests—will become clearer still if one remembers that the first problem can arise only in the case of war, whereas the latter is capable of arising and has, in fact, arisen in times of peace and even in reference to nuclear tests carried out to further peaceful uses of atomic energy.

Therefore, what we have to discuss and ponder over is first whether any known and accepted principles of international law can be applied to the situations arising out of these tests. If none are applicable or if such as are applicable are not adequate to meet the situations which are developing, the further point to consider is whether any extensions of the existing principles can be worked out so as to impose responsibility on the testing States. Finally, it will be a matter for consideration whether international law, which has in several cases in the past met new situations by evolving new principles, cannot in the present case similarly attempt to counter the grave threat to which States generally are exposed by the holding of these tests by the formulation of a suitable doctrine. Before, however, we can enter upon these questions with advantage, we need to have a clear idea of the extent and nature of the threat to the very existence of man which these tests involve.

Though some States which carry out these tests do it secretly, so that it is not possible to know of their consequences, and though

others have boldly denied that any evil consequences at all follow them, it can, we think, be said that the known results of some of the tests, scientifically and technically examined, leave little room for doubt that it is not possible to confine even the direct effects of these tests to the territory of the testing State. The indirect effects are naturally more widespread in the shape of pollution of air by radioactive material, economic effects on residents and industries in distant regions, meteorological effects over wide areas, interference with the freedom of air and sea navigation and the destruction of the living resources of sea. It would, therefore, we think, be safe to proceed on the assumption that the adverse biological and genetic effects and the widespread economic damage resulting from the fall-out of the radioactive tests cannot be denied.

In this connection, the questions of the responsibility of the testing State in respect of its own nationals and the aliens within its territory may well arise. But it appears to us that the more important question is that of the responsibility of the State in respect of injury of different kinds to persons and property outside its territory.

A State has no doubt sovereign authority over its own territory. But can such rights of sovereignty extend to possessing something of doing some acts on its own territory which will injure or destroy or adversely affect the citizens of other States? The sovereignty of each State can be exercised by it only consistently with the sovereign rights of other States. This is the basis of the doctrine well accepted in international law that a State may not use its territory contrary to the rights of other States. Anglo-Saxon municipal law and doubtless other system of municipal law prevent an owner of property from doing acts on his property and dealing with it in a manner dangerous to the neighbouring owners. A similar doctrine should, broadly speaking, be applicable in international law and the State harbouring dangerous things on its territory or entering upon adventures on its territory likely to cause damage outside its territory should incur legal responsibility to other States. The responsibility should extend to every kind of damage whatsoever—biological, meteorological, economic and otherwise—which can proximately be traced to the acts of the State on its own territory. Such acts would be international torts.

Would in such cases the occurring of actual damage be necessary before a State can be fixed with responsibility? Would not the certainty or probability of damage be enough? Could not, as in many systems of municipal law, a State be compelled to desist from its dangerous acts by appropriate action? By what agency or in what manner can a State be made to desist from such action? Here one more aspect of this question requires our consideration. In the municipal law relating to the tort of negligence or nuisance, compensation or damages for the harm caused may be an adequate remedy in some cases; in other cases, relief by way of compensation of the intended threat or danger is the appropriate remedy. In the matter of nuclear tests, the direction of the danger is often unpredictable e.g., miscalculation of the weather conditions etc. In view of the unpredictable nature of the harmful effects likely to be caused, it is a matter for consideration whether prevention of such tests, which are fraught with great danger to mankind, is not the appropriate remedy.

Another aspect of the question which has recently assumed some importance is the likelihood of unforeseen accidents in the matter of these nuclear tests resulting in adverse effects which cannot be controlled by any human agency.

Another approach to the problem is a consideration of the action of some States in virtually depriving other States temporarily of the use of the high seas on the ground that certain areas on the high seas would be for a time danger zones. A similar disability in the navigation of certain air spaces is also imposed. Is it permissible to these testing States to deprive other States even temporarily of the freedom of navigation of parts of the high seas and air space by declaring them to be danger zones? The question is not free from difficulty and the answer would perhaps depend on whether these rights of navigation are absolute rights or "relative rights which must be exercised in a spirit of reasonableness and moderation."

These are only a few of the problems which States who do not indulge in these tests will have to consider by reason of the ever growing competition in "cosmic irresponsibility" which is reaching "a point when it threatens to affect seriously the life and health of the populations of the rest of the world." We may not, however,

forget that legal solutions and legal restraints are hardly an adequate or constructive answer to a race in nuclear tests on a large scale which is bound to result in the gradual pollution of the air, water and soil of our planet. What may be a solution "is a world public order which any of the parochial States can flout only at its own risk."

Ceylon:—We in Ceylon have always been against nuclear tests because we feel that as long as these tests are capable of causing, and have in fact caused, the adverse global, biological, genetic and economic effects that have been so ably set out in the general note prepared by the Secretariat of the Committee, they should be condemned by this Committee and condemned in no uncertain terms. We are no doubt deeply conscious of the vast scientific possibilities that are opened up by these tests. But we feel that as long as these tests are capable of causing the great misery that they have caused to countries affected by them like, Japan, Ghana and the U.A.R., any beneficial results that may accrue to mankind are offset by such results, and unless and until science can evolve some method by which these tests can be carried out advantageously without their corresponding miseries to mankind, no words of protest against these tests would, in our opinion, be too strong.

The history of these tests has been set out in the general note prepared by the Secretariat and in the forthright statement made by the Distinguished Delegate of the United Arab Republic. It is not necessary for me to add to the facts so ably presented in these two documents. But our country feels that the explosions that have been carried out in the past, and that have been recently proposed by countries, like France, which intends to explode a nuclear weapon in a direct line to the south of our own island, cannot be too strongly condemned. In making the protest, we are not motivated by any insular outlook, because our country, though a small one, has never hesitated to protest, and to protest in the strongest terms, against any attempt by any power, whether larger or small, to endanger the lives and the economy of other countries.

Now we consider the legal aspects. These tests have been defended on grounds of the sovereignty of the State and the security of the State. To these defences, the simple answer seems to be

that when the very survival of the human race on this planet is in issue, every other consideration must bow before this paramount consideration.

If it is alleged that the same process is used in the development of atomic energy for peaceful purposes, as, for example, in the construction of nuclear weapons, we still feel that there is no choice but to insist on a total ban unless and until human ingenuity can devise a safer method of handling these materials, preferably under the directions of the United Nations or some other representative world organization.

We have no doubt whatsoever that the tests that have been held so far are violative of the principle of the freedom of the seas and the use of the air space above it.

On the question of the use of mandated and trust territories for the staging of these tests, we feel that this is a flagrant violation of the sacred trust that has been placed in the trustee countries and it must be condemned without hesitation.

Another question that has been posed is whether a country can shelter itself behind the argument that when these tests are carried out within the limits of its own territories, they are not legitimately the concern of other States. The answer is that as the effects admittedly are global, biological, genetic and economic, and in short, the problem concerns the future of mankind on this planet, and the available evidence shows that the extinction of the human race by the continuance of these tests is a distinct probability and a frightful reality, jurists and world opinion are compelled to condemn them, to declare them illegal and to be contrary to the interests and welfare of mankind. This, in our opinion, applies equally to the safety of all persons residing within the territories of the offending State, both nationals and aliens. In condemning these tests, it would appear to us that this Committee need no longer hesitate to register its emphatic protest with one united voice. There is no room for delay nor would it appear to us that there is any need to go back to and adopt old principles to meet the most perilous situation that has confronted the human race in its entire recorded history. These old principl s were evolved at a time when jurists never for a moment contemplated the vast potentialities and the serious repercussions of these tests. This

Committee should not only condemn at this session nuclear tests, as at present practised, and in whatever form, as illegal, but also keep this subject in constant review and carry on a relentless struggle to outlaw such tests until a safe and sure test is evolved, and in the meantime bring before the Bar of world opinion every nation that has been, or is, or will be, guilty of this grave crime against humanity.

It is, therefore, with the greatest pleasure, that I endorse every word uttered by the Distinguished Delegate of the U.A.R. in his concluding paragraph and support the resolution proposed by him to outlaw nuclear tests and to suspend and to prohibit such weapons, and to liquidate the bases of these tests, unless and until a safe and sure test is evolved.

Indonesia:—Nuclear tests have been watched by people all over the world with deep anxiety and profound concern. The stupendous possibilities of destruction of life and property and serious damage to future generations by nuclear explosions have been engaging the minds of jurists, scientists and statesmen ever since the atomic bombs were dropped on Hiroshima and Nagasaki. At the same time, the peaceful uses of nuclear energy have opened the eyes of the world to new avenues of dazzling progress through the application of this newly found source of energy for the benefit of mankind as a whole. While the discovery of gunpowder, the steam engine and electric power have brought about revolutionary changes in earlier ages, none of them has presented mankind with such a dilemma as the discovery of the energy hidden in the atom. The question of the legality of nuclear tests, as we are all aware, is a new subject in international law as the nuclear test itself dates back only to the last two decades. The importance of the subject, however, could hardly be exaggerated as the future of mankind and civilization may hinge upon the timely arrest of these tests. Moreover, as the tests which have been conducted so far have been mostly held in the Asian African region, the Asian and African States are the parties who are most directly concerned with the question. In addition to that, the consideration of the subject by the Committee has become almost imperative in view of the fact that notwithstanding the strong protests by Asian African and some other States, France has seen fit to hold in succession three tests in the Sahara and there has been no indication so far that she would depart from her ill chosen path even in the face of a resolution of the General Assembly of the United Nations expressing grave concern over the tests and urging the discontinuation of these tests. Before long more powers may acquire the scientific knowledge of producing atomic bombs and they also may wish to test the results of their research and to perfect their atomic devices. This in turn would induce others to do the same, and the most dreadful vicious circle ever to occur in the history of mankind would become a fact.

Before we proceed to deal with the legal issues involved in the conduct of nuclear tests, we wish to make it quite clear that we are at this session only dealing with the holding of nuclear tests in peace time and not with the legality of the use of nuclear weapons, although there is, as the distinguished Delegate for the U.A.R. has pointed out, a close relationship between the two questions, as the tests which have been held so far were meant to perfect nuclear and thermonuclear weapons, we do agree with the distinguished Delegate for India that the question of the legality of the use of nuclear weapons in warfare is in law a separate question governed by the conventional and customary rules of war. We wish also to make it perfectly clear that the remarks which we are going to make relate only to the kind of nuclear tests as are described in the note of the Secretariat. The Secretariat should in our view be commended for the excellent note they have prepared for the Committee.

As to the legality of nuclear tests, we have no doubt whatsoever that they are illegal and that they should be prohibited. The dangers to which mankind is exposed by the continuation of such tests have been amply described in the note of the Secretariat. Although the direct damage caused by heat, blast and radiation generated by the tests may be kept within certain controllable limits by the testing power as the tests which have been held in the past have been conducted in remote and thinly populated areas, the spread of radioactivity through the fall-out of radioactive dust cannot be predicted as the radioactive clouds created by the explosion, after having been blown in the atmosphere, may be carried by prevailing high winds to any part of the world and may endanger life or cause serious injury to persons living at far-away places. The grave risks inherent in the unpredictability

of the spread of the fall-out to places many thousands of miles away from the scene of the test have been established beyond any doubt by the studies done by Japanese scientists on the spread of radioactivity in Japan following in the wake of the test held by the United States in the Marshall islands through radioactive dust and rain. Even the fish caught in the seas around Japan have been found radioactive. While on the subject of the unpredictability of the spread of radioactivity through radioactive fall-out, may I draw the attention of the Committee to a news item which has appeared in the Japan Times of 18th February. The paper carried a report by a Japanese scientist who has recently returned from Italy to Kagoshima aboard of a fishing training ship, that his scientific team has found the Indian Ocean highly radioactive. The team has detected 60 to 70 counts of radioactivity per minute in plankton collected while the ship was in the Indian Ocean near to Equator. The question which immediately arises is where does this radioactivity come from? Most probably from the latest French test in the Sahara, because to our knowledge that is the only test which has been held recently. If that assumption is correct, it would again be another proof as to how far radioactivity can be spread by a fall-out. While excessive exposure to radioactivity may lead to death and serious injury or illness such as bone cancer, leukaemia and other serious diseases, particularly when it contains strontium-90, eminent scientists have also maintained that it caused adverse genetic effects. Moreover, it has been asserted that the genetic effects of radiation are cumulative. Thus any new explosion would not only present a serious danger to the present generation but also may endanger future generations. Although in some interested quarters there has been a tendency to minimize the dangers of these tests to mankind, the findings of the report by the World Health Organization on the physical and biological effects of exposure to radioactivity to the 1955 Geneva Conference on the Peaceful Uses of Atomic Energy should be accepted as authoritative.

Nuclear tests may be held by the testing State within its own territory or in a non-self-governing territory under its administration or in a trust territory or on the high seas. When the test takes place in its own territory, a State may claim that it is within its sovereign right to do so, but at the same time it should be pointed

out that in exercising its sovereign right a State is under an obligation to prevent its territory from being used for activities detrimental to the interests of other States. We fully agree with the preceding speakers that this customary rule of international law should apply here although the detrimental act has been committed by the State itself. No State has the right to endanger in peace time the lives of persons or to cause injury to them and their property in other States and the holding of nuclear tests with the consequential unpredictable spread of radioactivity through the fall-out of radioactive materials present undoubtedly a serious danger not only to neighbouring States but even to far away States, or to ships on the high seas. While it may be argued by others that such a rule does not exist in customary international law, it should be pointed out that it certainly violates the principle of good neighbourliness as enshrined in the preamble of the U.N. Charter and explicitly expressed in Article 74 of the Charter. Moreover, in our view, it is a violation of an inherent obligation of being a member of the community of nations. A State holding such tests commits in our view an illegal act or at least an international tort while the damage done to life and health of persons and property in other States should be compensated. This principle of responsibility and indemnification should also apply to foreigners who happen to be in the testing State while the compensation to be paid to its own nationals is a matter which falls within the purview of the municipal law of the State concerned.

As to nuclear tests conducted in non-self-governing territories, we fully agree that it is a violation of the United Nations Charter obligations as laid down in Articles 73 and 74. Article 73 defines the non-self-governing territories as territories whose people have not yet attained a full measure of self-government. It is clear that these territories are not parts of the metropolitan area proper of a State. Thus the administering State does not have sovereignty over the non-self-governing territory as it has over its own territory. This is particularly so because the administering State has the responsibility to develop self-government and to assist them in the progressive development of their free political institutions. Therefore, sooner or later, these territories must have their own government, unless they themselves desire otherwise. Article 73 requires, among others, that in administering the non-self-governing terri-

tories, that State must ensure the just treatment of the people of the non-self-governing territories and protect them against abuses. It will be very unjust indeed and a manifest abuse to explode a nuclear test on a non-self-governing territory and to subject the people there to dislocation, to destroy their land, and to expose them to the dangers of radiation. Under Article 73 of the Charter the administering State has accepted as a sacred trust the obligation to promote to the utmost the well-being of the inhabitants of these territories. The holding of nuclear tests would perhaps promote the interest of the administering State. But it could never be said that it will promote the well-being of the inhabitants of these territories. On the contrary it will retard their development and subject them to harms and damages of considerable extent. Moreover, Article 74 of the Charter prescribes that the administering State should follow the general principle of good neighbourliness in the non-self-governing territories and due account must be taken of the interests and well-being of the rest of the world. It is certain that the neighbouring States of the non-self-governing territories do not want to see the air of the non-self-governing territories polluted by radioactive materials endangering their own people and safety. By detonating nuclear devices in the non-self-governing territories, the administering authority has violated the provisions of the Charter and it should therefore be regarded as illegal.

While a State has a certain measure of sovereignty over a non-self-governing territory which may be termed conditional sovereignty, an administering authority of a trust territory does not have sovereignty. It is holding it as a trustee under the supervision of the United Nations. The conduct of nuclear tests there is certainly a violation of the principle of trusteeship. The test is definitely prejudicial to the interest and the safety of the people. No matter how elaborate the preventive measures are that are taken, it has not only the effect of destroying their property but also the effect of upsetting their way of life. They may also be exposed to radiation as has occurred in the Marshall Islands test in 1954 by the United States. The conducting of nuclear tests in trust territories is in contradiction of the basic principles of trusteeship and it also constitutes in our view an arrogation of sovereign rights which the administering authority does not possess. They should, to our mind, be regarded as illegal. Nuclear tests, if conducted on the high seas,

do in our view violate the four freedoms of the sea. These tests will definitely cause the pollution of the sea and the destruction of the living resources of the sea while in addition to the radioactive fall-out, radioactive fish may endanger the life and health of people living in far away countries. Navigation, fishing, the flying over the danger area have to be suspended for quite some time while submarine cables may be affected. The freedoms of the high seas are designed for the benefit of humanity and not for the convenience of one or two States, detrimental to the rest of the world. We are, therefore, of the opinion that nuclear tests on the high seas are an infringement of the freedom of the high seas and are therefore illegal.

In conclusion, I wish to address myself to the suggestion made by the distinguished Delegate for the United Arab Republic to the effect that we should adopt a condemnatory resolution. We fully agree with the idea, and we are supporting it.

Iraq:—It has been suggested, if I may recall, that it would be more appropriate for the Committee at this juncture to deal primarily with the problem of immediate concern, namely, the legality or otherwise, of the nuclear weapon tests. We are in favour of this view. However, before proceeding with our comments on the subject, which will be presented in broad outline and in a rather sketchy fashion, we wish to emphasize that although Iraq is opposed to all tests of nuclear weapons wherever they are carried out, it however views with particular concern and anxiety the nuclear tests carried out by France in the Sahara desert, and we deem it opportune to voice our condemnation of these tests. In regard to the problem of the illegality of nuclear tests, we wish to make the following remarks :

We do not share the view that a State is free to use its own territory for testing nuclear weapons, because we believe there is ample evidence that such tests cause injury to life, health or property of nationals of other States, and are therefore, contrary to the general rules of international law. We are of the opinion that no State has an absolute right to close portions of the high seas, perhaps even temporarily, to users of other nations. Therefore, if the testing of nuclear weapons by a State results in barring parts of the high seas to users of other nations the conclusion seems inescapable, in our view, that this act is contrary to the rules of inter-

national law. This view may find support in the decision of the International Court of Justice in the *Anglo-Norwegian Fisheries Dispute* 1951, and also in the preamble to the Charter of the United Nations and in Article 74 of the same. It may be necessary, on the other hand, to point out in this connection that if nuclear tests carried out by a State in certain portions of the high seas result in inflicting actual injury on the life, health or property of nationals of other States by means of radioactive fall-out which may lead to a dangerous pollution of the atmosphere and water, when these nationals happen to be outside the danger zone, that would constitute on international tort. Indeed, one may go so far as to suggest that in these circumstances, and under specified conditions, certain international instruments, such as the Geneva Protocol on Poisonous Gases and Analogous Materials of 1925 and the Genocide Convention of 1948 may be applicable.

We are inclined to support the view that nuclear tests carried out in a trust territory, whether it be a strategic area or otherwise, are contrary to the letter or spirit of the pertinent Articles of the United Nations Charter or a trusteeship agreement concluded between the United Nations and any State.

Finally, we are of the opinion that this Committee should pass a resolution condemning these tests as a crime against humanity and recommending the initiation of international legislation to this effect.

Japan:—This Committee is well aware that the people and the Government of Japan are deeply concerned with this topic before us. As we are the only people in the world who suffered from the damage by atomic bombs dropped during the War, we have a very strong feeling that all the nuclear tests should be prohibited. Indeed, this feeling of ours is based on humanitarian considerations. As such, it is above any other consideration, legal or otherwise. Several resolutions which were adopted by both Houses of our Diet for the prohibition of atomic and hydrogen bombs may be regarded as a reflection of a deep feeling of the Japanese people.

With such psychological background, the Government of Japan have made strong diplomatic representations, whenever and wherever the atomic or hydrogen bomb tests took place, for the suspension of such tests; they did so against the United States,

the Soviet Union and the United Kingdom. Recently they did the same against France. If the need arises, our Government will do so in the future.

However, it must be pointed out that there are two aspects in the use of nuclear energy. The one is the use of nuclear energy for peaceful purposes and the other for military purposes. We the Japanese people are determined to use nuclear energy for peaceful purposes and for peaceful purposes only. Admittedly, the use of nuclear energy for peaceful purposes involves in itself many complicated legal problems, both domestic and international. Take, for instance, the question of liabilities of the owner of nuclear reactors for the possible damage to the third party. As we understand, countries like the United States, the United Kingdom and Switzerland have enacted laws providing for strict liability on the part of the owner of the nuclear reactor. In Japan, too, a bill providing for strict liability is now being prepared by the Government and will, I suppose, be enacted by the Diet at its present session.

As for the international aspect of the peaceful uses of nuclear energy, common efforts are being made by jurists and lawyers of the world for international legislation on the subject; a Draft Convention on Third Party Liability in the field of nuclear energy prepared by the Organization for European Economic Co-operation and a draft Convention on Liabilities of the Operator of Nuclear Powered Ships prepared by the International Maritime Law Conference may be cited as examples.

However, we believe that the task for this Committee at present is not to be concerned with the peaceful uses of nuclear energy. Our task is to study another aspect of the picture, that is, the use of nuclear energy for military purposes.

Before we go into the discussion on this matter, we have to bear in mind that there are really two different questions involved. As the distinguished Delegate for India pointed out, in his very enlightening general statement, distinction must be made between the legality of the use of nuclear weapons in time of war and the legality of nuclear tests in time of peace.

As for the legality of the use of nuclear weapons in time of war, legal opinions may differ depending on the interpretation of

the existing customary international law, various international conventions, or the general principles of law as recognised by civilized nations. Yet, the Delegation of Japan wish to make it clear that the use of nuclear weapons in time of war *should*, to say the least, be prohibited as a matter of *lex ferenda*.

After having made this point clear, we now come to the point of more immediate and direct concern to the Committee—the legality of nuclear weapon tests in time of peace.

Here, again, the opinions differ on the question of fact. Opinions of scientists differ with regard to the effects of radioactive contamination resulting from nuclear tests. The views of Japanese scientists contained in the Background Paper prepared by the Secretariat indicate the harmful effects of radioactive contamination. On the other hand, the United Nations Scientific Committee which was entrusted with this work did not draw in its Final Report a clear conclusion regarding the harmful effects of radioactive contamination resulting from such tests. Such differences of opinion may subsist before a detailed and long-term study and observations shall have been carried out on the genetic effects of radioactive susbtances on human beings and their environment.

In the circumstances, our position is that, in the absence of scientific proof to the contrary, all the nuclear tests which may more or less contaminate the air should be suspended as soon as possible from the humanitarian point of view, since it seems to be only reasonable to assume that as long as nuclear tests are continued, the cumulative radioactivity may reach dangerous proportions injurious to human health to a point beyond the power of science to circumvent or cure.

Without prejudice to the humanitarian considerations mentioned above, we should like to touch briefly on the legality of nuclear tests. In doing so, we think that it may be useful for us to consider the matter in three different phases depending upon the places where such tests are to be carried out.

Firstly, the case in which nuclear tests are carried out in the territory of the State conducting such tests. We consider that in such cases the question of State responsibility under international law does not arise as long as such tests do not affect the life and

property of the population in the neighbouring and other States. Of course, if an alien in the territory of the testing State is affected by such tests, the alien's home State has the right to exercise its right of diplomatic protection in accordance with the existing international law. However, it seems hardly possible because of the very nature of radioactive fall-out that the effect of such tests could be limited in the territory and would not go beyond the territory of the testing State. Therefore, if the existence of the harmful effects beyond the territory of the testing State can be proved by scientific evidence, the testing State is to be held liable for an international delinquency. It may be further stated that in such a case, the liability of the State which carried out the tests should be that of strict liability, at least from the point of *lex ferenda*, if not under the existing international law in force.

Secondly, the case of nuclear tests carried out on the high seas. We think that there should be reasonable adjustments among the traditional four freedoms of the high seas mentioned in the Draft Convention on the High Seas adopted at the United Nations Conference in 1958, and the alleged new freedom to use the high seas for atomic tests. We consider that the carrying out of nuclear tests in the area vital for navigation or fishery on the high seas, for instance, is contrary to the existing international law.

Thirdly, the case of nuclear tests carried out in the United Nations trust territory. In our view, it will be contrary to the spirit of the Charter of the United Nations for a trustee authority to use territories which it holds on trust from the United Nations, although there is no explicit provision in the Charter which prohibits the use of trust territory for such purposes.

In closing, may I emphasize once again the urgent need for suspension of nuclear weapon tests based on the humanitarian considerations involved in the question of nuclear tests. This view of ours, we think, is shared at least by the common people both in the Communist and non-Communist States. We are firmly convinced that these overriding humanitarian considerations should not be lost sight of by the results of technical and legal analysis of the whole question.

Burma:—I have listened with rapt attention to the clear and dignified statements made by the distinguished leaders of the U.A.R., India and Ceylon. May I say for the Burmese Delegation that we endorse their views on the subject without any reserve. Whatever may be the specious arguments advanced to justify nuclear tests, the fact, incapable of being controverted, remains that the effects of these nuclear tests are harmful to the extreme, not only in the immediate vicinity where the test is carried out, but with prevailing winds or the vagaries of disturbed nature, the area affected may be boundless. We are told that there is such a thing as a clean bomb, but even if it is so, it is only a matter of degree and it nevertheless remains an evil; and it is unpardonable to foist evil upon mankind. For every argument that nuclear tests are permissible and legal, more convincing reasons can be advanced against such a proposition. In any case, it requires no great learning in law to be convinced that the effects of nuclear tests are evil and harmful to mankind, and that to pursue in carrying out these tests, despite protests, is immoral. I do not wish to say much on a subject which must revive such painful and bitter memories to our hosts who were the victims of atomic bombs. I share the pessimism of the distinguished Delegate of India when he said that legal solutions and legal restraints are hardly an adequate or constructive answer to a race in nuclear tests and therefore may I say only this, the Burmese Delegation is convinced that the pursuit of nuclear tests is immoral and should be condemned.

Pakistan:—I have listened with utmost respect to the admirable statements made by the distinguished Delegates. The moral and ethical principles enunciated by all of them, especially the distinguished Delegates from the U.A.R., India, Burma and Japan, are rationally valid and hold in them a promise for salvation of man. It is true, as has been pointed out, that the world is hanging insecurely between the prospects of a crushing sky and a gaping hell. It seems that with every increase in human skill as to means, there is also an increase in human follies as to ends. Intellect which has sharp eye for methods and tools appears oblivious at times to ends and values. The splitting of the atom, which would have been a boon to man, now hangs over his head like the sword of Damocles. The old complacent faith of man about his irresistible progress is tampered by serious doubt. The doubt has now passed into

alarm. Man is out to conquer the moon and Venus—he has yet to conquer his worst enemy—himself. We live at a stage of technological development where the moral of man to alleviate the perils of his own creation has become an imperative necessity. Life has some meaning and some purpose. An awareness of that meaning and purpose will give man his higher consciousness of his manifold relationship with the creator and the principles to live by and the purposes to live for. We see in these issues, a great moral and ethical crisis of our times. It has been pointed out also that it is an issue of International Law. The opinions of the jurists, however, are extremely conflicting. It involves very complicated and intricate questions of law of great importance and magnitude. I will refrain myself, at this stage, from offering any comments on this subject. It must, however, be admitted frankly and honestly that it is also a political issue of the utmost importance. We cannot build an ivory tower of our own and consider ourselves immune from the objective realities of political life. Our thinking unrelated to the political realities of the day may make it a form of escapism. Any blueprint of concepts and convictions unrelated to the objective realities may not be conducive to the attainment of the ideals it is meant to achieve. The Geneva talks were held by the Powers concerned regarding the banning of nuclear tests. The talks were suspended. The parties suspended nuclear tests according to their own statements, even though no agreements were reached. The talks are going to be resumed soon—I understand very soon, in the month of March—as I read in the papers. I am sure all-efforts will be made there to reach an agreement. Under the circumstances, my Delegation will not commit itself to any position or situation which will prejudice the Geneva discussions in any manner and further obscure the political atmosphere or make it a little more complicated or confused than what it is today. In view of our stand, not to prejudice the forthcoming Geneva discussions, I shall refrain from making any comments on the Agenda item we are discussing and I shall abstain from any voting on the item. However, in the end I shall reaffirm and reiterate the moral and spiritual crises as pointed out by the very distinguished Delegates, especially of U.A.R., India, Burma and Japan.

Observer for Ghana:—The legal and moral implications of nuclear tests have been so comprehensively thrashed out

by the distinguished Delegates that I do not intend to reiterate those points. I wish, however, to dwell briefly specially on the question of the French tests which in our view is tending rather to make any agreement on the cessation of nuclear tests more complicated, because we know that the three major nuclear Powers have agreed among themselves to suspend any further tests, but it is only France who lately has broken this moratorium and therefore my Government has not, as it is quite well known, hesitated; in company with other like-minded governments, to condemn this move on the part of France. The argument that the Sahara Desert is part of France is, of course, very much in dispute, and we have never been able to accept that theory. There is also the other point of whether a metropolitan power can undertake any action such as nuclear tests in a colony which we all know is prejudicial to the welfare of the inhabitants, so that my Government feels that since this Committee is composed of members which are not nuclear powers, it is especially appropriate that we should use any moral force we have to make our voice heard on the councils of the world and try to bring pressure—moral pressure—on the nuclear powers, not only to suspend, but to stop any further nuclear tests. As, I remember, was stated here not long ago by some delegate, international law so far has been designed to the interests of the greater powers. Whatever finally is to their interest has international sanction and there was a time when even colonialism was regarded as a matter of course because at that time the colonial powers felt it was in their interest that territories should be colonized. We are of the opinion that that era is now past forever, and that we should also in our own small way contribute to the formulation of the international code of conduct. If this Committee can pass a resolution or initiate any move on this subject to that effect, we shall be very grateful and we shall be pleased to associate ourselves with it.

Observer for International Law Commission (MR. F. V. GARCIA-AMADOR):—I would just like to say a word in connection with the subject of nuclear tests and, I will limit myself to the purely legal aspect. This is, of course, a problem of international responsibility like any other one and not only in the broad sense but also in the strict sense, because in normal cases, the injury in this case would be an injury to an alien and the international claim may be based.

and has been based in a very small number of cases, on the basis that an injury has been done. In this connection, I would like to read a short paragraph from my fifth report in which I deal with the matter. I was referring to the fact that there is not yet an international obligation of a precise, well defined character with respect to nuclear tests, and this is still so today as you have recognized in this discussion. Nevertheless, if a State experiments on the high seas, if the State involved has the freedom to use the high seas or the air space, or even its own territory, the question arises whether the exercise of that freedom would be lawful if it involved activities potentially harmful to such important interests as safety of human beings. From the point of view of international responsibility, the problem is not to determine whether or not there is a well defined precise prohibition against conducting a particular test on the existing condition. It is enough to know that the activities concerned imply by their very nature and by their harmful consequences, the abusive, unlawful exercise of a right. The expression "a right" is used because scientific tests that are incapable of causing injuries are entirely compatible with the freedom of the use of the high seas and of air space. But according to Article 2 of the Geneva Convention, this freedom, whatever its manifestation, shall be exercised by all States with reasonable regard to the interests of other States in their exercise of the freedom of the high seas. In short, today, a proposal has been made to find a solution to this problem by the theory of objective absolute liability, liability or responsibility without fault, but unfortunately, technically speaking, this is not applicable simply because today we don't have an international obligation prohibiting those acts. We are looking for but still today there is no such obligation—on the contrary a State can do that either on the high seas under the freedom of use of the high seas or in its territory as an unquestionable right. So in order to find a basis for imputing international responsibility for damage done as a consequence of the nuclear experiment, you have to resort to the legal notion of the abuse of rights. There may be no international obligation to do it, but you find in international law today the notion that a State may not exercise its right in such a manner as to produce harm to others, and in this connection, there is no doubt that so far as the high seas are concerned, the Geneva Convention is literally applicable whether the tests are illegal or not, it does

not really matter nor is it necessary to impute international responsibility. But the only thing is that in cases of injury the fact, that the State has abused its right, is enough. This is the opinion, that was held by a very well known French Professor of public international law, Prof. GIDEL, who very strongly condemned not only such tests but argued very wisely that all these argumentations set forth by some other writers trying to justify the legality of these tests were incorrect. So what we can say in regard to the tests on the high seas, we can also say with regard to the tests conducted by a State in its own territory, or territories under its jurisdiction. There is no doubt that a State's territory may be used for any kind of experiment, but, if that State's territory is used or I should say abused, with all the consequences I have mentioned, international responsibility is automatically incurred, and in this respect I would like to call your attention to a rather recent international decision, namely the decision of the *Trail Smelter Arbitration* between the United States and Canada in which the tribunal admitted that though the State was exercising a right in general, if the exercise of that right caused damage, that State would be responsible for injuries done in the territory of other States or to persons in the territory of other States.

III. TOPICS FOR DISCUSSION

Topics for Discussion

(a) *Factual, Scientific and Medical Aspects*

1. The nature of direct damage caused by atomic explosions resulting in deaths of human beings and destruction of lives and property—area over which such destructive effects are spread out—can it be confined within the areas or territories of the State which is carrying out the tests ?

2. The nature of indirect damages :—

(a) *Pollution of the air* with radioactive material—area over which such radioactive material can be said to contaminate the atmosphere—can such pollution be confined to the territories of the particular State which is carrying out the experiment—the effect of such pollution on the health of the people.

(b) *Economic Effects* : (1) Mass movement of the population due to evacuation of the areas in which tests are to be carried out; (2) possibility of the deprivation of means of livelihood of such people due to their movement from the place of their residence and work; (3) Adverse effects on particular industry or industries due to contamination with radioactive matter *e.g.*, effects on fishing industry in Japan after the Marshall Island tests.

(c) *Meteorological Effects* : Effect on the weather—variation in temperature, radioactive rain etc.—the area over which such effects take place and the time during which these effects remain.

(d) *Interference with the freedom of air navigation and navigation in the High Seas*, due to vast area being rendered unsafe for such navigation at times when the tests are being carried out.

(e) *Destruction of the living resources of the Seas.*

(b) *Legal Aspects*

1. (*a*) Is a State responsible or ought it to be so for direct damages caused to the inhabitants of the area where the tests are carried out due to deaths of human beings and destruction of their property resulting from explosions of atomic devices under the law of tort or principles analogous thereto ?

(*b*) If such damage is caused to a foreign national resident or sojourning in its territory or to one who may be accidentally passing through the danger area, would the State which is carrying out the tests be liable to pay reparation to the injured alien's home State under the principles of State Responsibility in International Law ?

(*c*) If such damage is caused to a foreign national whilst resident or sojourning in a neighbouring State, would the State carrying out the test be held liable to pay reparation to the injured person's home State under principles analogous to that of State Responsibility in International Law ?

II. (*a*) Can it be said that a State which carries out atomic tests in its own territory is endangering the safety and well being of its neighbouring States and their inhabitants due to possibilities of radioactive fall-out : and if so, whether the use by a State of its own territory for such purposes is not contrary to the principles of International Law ?

(*b*) Can it be said that the use by a State of its own territory for the purpose of carrying out nuclear tests by explosion of atomic devices amounts to an abuse of its rights in respect of use of its State territory?

III. (*a*) If it is established that explosion of nuclear devices results in pollution of the air with radioactive substance and that such contaminated air is injurious to the health of the peoples of the world, would the State carrying out the tests be said to be responsible for an international tort in accordance with the principles laid down in the Trail Smelter Arbitration Case ?

(*b*) In an action based on commission of an international tort, would it be necessary for the claimant State to prove actual damage, or is the general scientific and medical evidence on the effects of nuclear explosions sufficient to maintain the action ?

(*c*) Even if the harmful effect resulting from contamination of the air can be confined within the territories of the particular State, can it be said that the State has violated the human rights of the citizens and aliens living in its territory, and if so, whether the State is responsible for the harm caused to the aliens under the principles of international law relating to State Responsibility ?

IV. Is the use of atomic weapons in a war illegal, and if so, can the tests carried out for the purpose of manufacture and perfection

of such weapons be said to be illegal by itself without proof of any damage ? Can the question of stoppage of such tests be said to be a matter of international concern ?

V. Would the payment of damages by a State for injuries suffered due to nuclear tests be regarded as sufficient or should an injunction for stoppage of such tests be necessary ?

VI. Does the interference with the freedom of air or sea navigation resulting from declaration of danger zones over the areas where the tests may be carried out amount to violation of the principles of International Law ?

VII. Is the destruction of living resources of the sea which result from nuclear tests on islands or areas of the high seas to be regarded as violative of the principles of International Law ?

VIII. Is it lawful for a Trustee Authority to use territories, which it holds on trust from the United Nations, for purposes of holding nuclear tests ?

IV. STATEMENTS OF DELEGATES AND OBSERVERS MADE AT THE FIFTH SESSION

Statements of Delegates and Observers Made at the Fifth Session

Ceylon : My Delegation has endeavoured, in accordance with the suggestion made by our Secretary at the meeting of the Heads of Delegations on 17th January, to deal with the subject of nuclear tests in the first instance by propounding answers to the questions posed as Topics for Discussion.

In regard to the first question posed in paragraph I (a), our opinion is that the causation of damage or even death to the inhabitants of the area within the territorial jurisdiction of the testing State, except in the case of non-national inhabitants and except in highly exceptional circumstances pertaining to nationals, would not constitute a breach of international law, although of course, the damage may constitute an infringement of the Declaration of Human Rights.

Questions I (b) and (c) are questions falling within one of the two exceptions I have already mentioned, but I do not propose to offer any opinion on them at this stage because it seems to me that unless this Committee were to formulate an opinion that nuclear tests are illegal, in so far as they constitute either an international tort committed against other nations or an abuse of rights of the testing nation, little purpose would be served by any expression of opinion by this Committee on the comparatively minor problem of iniury to alien residents of the testing State.

Passing now to the second major question, at number II, paragraph (a) of that question is in two parts. The first part raises only a question of fact whether atomic tests in one territory do endanger the safety of neighbouring States and their inhabitants due to possibilities of radioactive fall-out. Perhaps the formulation of the questions preceded the Secretariat's Report, a reading of which leads very nearly to the conviction that the first part of the question must necessarily receive an affirmative answer, on the basis of the correctness of the facts as stated in the Report of the Secretariat concerning proved results of some of the tests, namely that the safety of neighbouring States and their inhabitants is necessarily endangered. I propose to refer later to the second part of the question at II (a) which is a purely legal question, whether the use by

a State of its territory for the purpose of atomic tests is contrary to the principles of international law.

I propose also to refer later to the question posed in *paragraph II (b)* but again on the same basis, namely that the Report of the Secretariat as to proved damage resulting from nuclear tests is to be acceptable to the Committee. But I should state straightaway that if the question intended to be posed in this *paragraph (b)* is whether there can be an abuse of rights *without proof of damage*, the question must be answered in the negative.

In the order of the topics there comes now that which is numbered III. Concerning *paragraph (a)*, it commences with the conditional clause referring only to the possibility that the explosion of nuclear devices causes pollution of the air and is thus injurious to the health of peoples of the world. Here again an expression of legal opinion is not called for unless it be correct that the fact of pollution has been established to our satisfaction by available evidence. Accordingly the legal opinion which I reserve to be expressed later upon this question will depend upon the assumption that from the report furnished by the Secretariat we regard the fact of dangerous pollution as being established to our satisfaction.

The answer of my Delegation to the question at *para III (b)* is a definite negative. We cannot conceive of any attribution of liability in tort which is not based upon actual proved damage caused by the alleged tortfeasor.

With reference to *para III (c)*, I need only reiterate the views already expressed concerning the comparative irrelevancy or at least unimportance of parts (*b*) and (*c*) of the question marked I.

I do not propose to offer any answer to the question formulated in *Para IV*. Undoubtedly the question whether the use of atomic weapons in war is illegal is one of unparalleled importance, and if the proper legal answer is in favour of the illegality of their use, it would follow very simply that the testing of such weapons is equally illegal if damage is caused thereby to the citizens or property of other States. But since the subject before this Committee is the comparatively narrower subject of the legality of nuclear tests, my own opinion is that a decision on that subject should not be based upon a decision on a parent problem which has not been proposed for our discussion.

The question marked V again assumes the illegality in international law of nuclear tests for no injunction can issue except in the event or at least the appearance of the commission or the imminent commission of an illegal act. Even on that assumption I do not understand the question posed in this para because it seems to me that the question under consideration, namely the question whether nuclear tests are legal or illegal in international law, does not call for any expression of opinion as to penalties or sanctions to be enforced against a nation guilty of the illegal act. Even if the matter of a sanction is within the scope of our discussion, I, personally, am unfamiliar with the existence of any device in the international organisation analogous to the device of an injunction issued in the ordinary process of a civil court.

Our opinion on the questions raised in paras VI and VII are in the affirmative, namely that the declaration of danger zones over areas where nuclear tests are carried out interfering with the sea navigation or causing the destruction of living resources of the sea is illegal. In so far as there may thus be interference with the freedom of the air, we express no opinion.

In answer to question VIII, our emphatic opinion is that if nuclear tests are proved to be injurious to the inhabitants of trustee territory on which they are carried out, the tests are illegal.

I have reserved our opinion on two matters. In regard to the second of those matters, namely the question of the applicability of the doctrine of the abuse of rights, I offer a tentative opinion. A suggestion has been made that the principle of abuse of rights might provide a solution of the problem of the legality of nuclear tests. That this doctrine is part of international law is subject to certain qualifications. It is true that a survey of the jurisprudence of the International Court of Justice and the Permanent Court of International Justice shows recognition of this doctrine. Although there is no authoritative decision or statement on the basis of this doctrine or any elaboration of its principles, surely in this field development can take place to cover this new situation.

Our opinion is that in view of the references, however indirect and *obiter* they may have been, made in judgments of the courts to the doctrine, it may fairly be said that if in fact there has been abuse of a national right causing injury to any State or its nationals, then

having regard both to any lack of justification on the one side and to the gravity of the damage on the other, there would be readiness on the part of a competent tribunal to apply the doctrine of the abuse of rights. Even so, the question of justification would be one of fact on which divergence of opinion may be possible.

It seems, therefore, relevant to consider whether a State which conducts nuclear tests can claim to have any justification for the tests. My personal view is that no such claim would be acceptable to an impartial international tribunal which, in the peculiar dreadful circumstances, should in my estimation form an opinion unfavourable to a nuclear testing nation. After all, what is the justification? It seems to me that nation A can only claim that it wishes to carry out nuclear tests in order to perfect weapons, which will be more effective in what that nation considers to be necessary self-defence against weapons which it fears might be perfected by nation B. Assuming this to be a real fear, and assuming the tests to be designed for the purpose just mentioned, what are the two matters which have to be weighed against each other in the scales? On the one hand, there is the fear of the greater effectiveness of the weapons which may be used by a possible opponent. It is a fear real enough but yet only of a possible danger. But on the other side of the scales is the actual damage inevitably caused by the tests themselves, the magnitude of which cannot yet be estimated. For myself, I would certainly think that the infliction of actual and present injury must outweigh the fear of a possible superiority in weapons, however dreadful their effectiveness. At the same time I must fairly concede that a nation which has real cause to fear that it may be the first victim of a possible enemy's use of nuclear weapons may find itself unable to agree with my opinion.

The earlier reservation of opinion on my part related to the question in II (*a*). The Report of the Secretariat suggests two bases, other than the principle of the abuse of rights, upon which liability for damage caused by nuclear tests can be said to rest. I ask for the indulgence of the Committee to defer, to a later stage of these discussions, a full statement of the views of our Delegation on the rather difficult questions which are involved.

For the present I will only indicate that we are inclined to the view that absolute liability for damage through activities *per se* dangerous are generally actionable according to the law recognized by civilized nations, and that accordingly that principle becomes applicable in International Law under Article 38 of the Statute of the International Court.

India : As this House is aware, the subject of legality of nuclear tests has been taken up for examination by this Committee at the instance of the Prime Minister of India, who drew the attention of the jurists to the subject in his inaugural address at the First Session of this Committee held in New Delhi in 1957. In the last Session of the Committee at Tokyo, considerable interest was shown in the subject by the distinguished Delegates who displayed a great deal of anxiety over the problem. Accordingly, the Committee decided that this subject should be placed first on the agenda of the present Session. The decision emphasises the importance which the member countries attach to the subject, and it is a matter of great satisfaction to the Government of India that the other member countries share their desire with equal keenness to study legal pros and cons of nuclear tests.

Since this Committee met last in Tokyo, various nuclear Powers have conducted quite a large number of tests causing serious alarm in the neighbouring countries. The resumption of these tests has heightened the urgency of our examination of their legality.

It is hardly necessary for our Delegation to set out at this stage the dangers to human life and property which nuclear tests imply. In the Tokyo Session, the distinguished leader of our Delegation had portrayed the widely destructive and damaging effects of nuclear tests and the other distinguished Delegates had also recalled with facts and figures the grave injury caused by the use of nuclear weapons in the past and the potential harms of nuclear tests. The Secretariat of the Committee, under the able guidance of our popular Secretary, Shri B. Sen, has made a close study of the subject and has presented to us a volume of material to assist us in our deliberations. We are indeed thankful to the Secretariat for the excellent work done by them in this direction.

Even the great Nuclear Powers are agreed that nuclear tests, being a preparation for nuclear warfare, are a malice to the very existence of mankind. Attempts have been made and are being made even now to ban nuclear tests totally, but as long as the race

for military predominance and the race of armament continue, the chances of total prohibition of nuclear tests appear to be bleak. Meanwhile, the non-nuclear nations, especially the neighbours of the nuclear nations remain in a state of tension, in a state of fear, that the large scale of nuclear tests might some day throw them out of existence. We, sitting around this table, have embarked upon examination of the problem from a legal angle, but we certainly cannot shut our eyes against the deeper human aspects of the problem.

Coming to the legal implications of nuclear tests, the questions which this Delegation considers relevant are : Has any nation a legal right to carry on activities which present a potential danger of causing mass destruction of the life and property of its nationals? In particular, has any nation a legal right to carry on activities which are likely to endanger the life and property of the adjoining nations? If a nation has no such right, what is the remedy available to its nationals and to the adjoining nations to prevent these activities? If these activities cannot be prevented, is the erring nation liable to make reparation to the victims of these activities? These appear to be major questions which this Committee is called upon to examine.

It is said that a nation enjoys absolute sovereignty over its territory and other nations have no right to challenge or criticise the doings of a nation over its own territory. Such a startling proposition might have held good in the ancient barbaric days, but does it make an appeal in the modern civilised world? Has a nation the unrestricted and unlimited power to deal with its nationals?

I. (*a*) The English courts and the courts of the various countries which follow the English legal system have been observing the law, the rule in *Rylands*, which lays down that any person who keeps anything likely to do mischief, if it escapes, keeps it at his own peril and is *prima facie* answerable for all the damage which is the natural consequence of such a keeping. It appears from a study of the Secretariat that that principle, somewhat in a modified form, was adopted by the major legal systems of Europe as well as by America. This rule, however, does not import the principle of State responsibility but implies responsibility of the individual who keeps the thing that causes damage. However, our view is that a State which permits prosecution of ultra-

hazardous activities like nuclear tests would also be responsible for the damage. The ultimate responsibility for the welfare of the State is of the State and, if the State allows people to carry on on its territory activities of an abnormal nature which are likely to cause unpredictable damage or destruction, the State must hold itself liable for the consequences of such activities. It is urged in some quarters that the State enjoys absolute sovereignty over its territory and it can do or permit the doing of anything on its territory for which it cannot be held responsible. This proposition, to our minds, appears to be a relic of the ancient barbaric age and cannot be advanced and could not make an appeal in the modern civilised world. That a nation does not enjoy unrestricted and unlimited power to deal with its nationals is, we think, amply recognised. No State can act "in complete disregard of the elementary dictates of humanity". This proposition has been accepted as declaratory of the existing law by the International Military Tribunals of Nuremberg as for back as 1946 and deeds of outrage have also been well settled by rules of international customary treaty law. We, living in the civilised age, must assume that the State cannot itself carry on, or permit any one to carry on, in its territory activities which present a grave hazard to the life and property of the community. The Charter of the United Nations also reaffirms, in its preamble, "faith in fundamental human rights, in the dignity and worth of human person." This, again, is an indication of the modern trend towards curtailment of the absolute sovereignty of a State over its territory. The Universal Declaration of Human Rights adopted by the United Nations also speaks of the willingness of States to surrender a portion of their sovereignty to preserve the right to life, liberty and security of every person. Under the Genocide Convention, the States have accepted as a treaty obligation to refrain from and punish genocide. These international developments in the recent times clearly established the recognition by the States of the principle that the State cannot exercise absolute and unrestricted sovereignty even in its own territory or in relation to its own nationals. Our Delegation is firmly of the view that in the light of the significant changes in the concept of State sovereignty which have been accepted by most of the States, the State must be held responsible for any damage caused to its nationals as a result of hazardous activities carried on on its territory with its knowledge or permission.

I. (*b*) A foreign national, resident or sojourning in the territory of a State, in whatever circumstances, would have the same rights as the nationals of that State, if he suffers damage due to hazardous activities in the State. The home-State will not *per se* be entitled to enforce the rights which will have to be enforced by the victim in the domestic courts. If, however, a State discriminates against aliens and denies to them those rights, it appears that their home-State can take up their case in the International Court of Justice on the ground of international delinquency caused by abuse of rights.

I. (*c*) In the *Corfu Channel case*, the International Court of Justice has recognised the principle of international customary law that a State shall not knowingly allow its territory to be used for acts contrary to the rights of other States. The *Trail Smelter case* is anoter instance where that principle was accepted. Accordingly, if a State, by its acts, causes damage on a territory of another, State, the first State commits an international tort and is answerable to the second State for reparation. That second State can seek reparation not only on behalf of its own nationals who have suffered but on behalf of nationals of other States also on its side. It is doubtful whether the other States whose nationals have suffered damage in the territory of the second State can seek reparation directly against the tortious State.

II. (*a*) A State carrying on atomic tests in its own territory is without doubt endangering the safety and well-being of its neighbouring States—even perhaps of the States beyond the neighbouring States—due to the posssibilities of radioactive fall-out. As far as the present scientific knowledge goes, the direction of the radioactive fall-out cannot be controlled and it depends largely on weather conditions. The use by a State of its own territory for purposes of nuclear experiments is definitely contrary to the principles of international law, in view of the possible injurious effects thereof on the people and property of the other States. The observations of the International Court of Justice in the *Corfu Channel case* unquestionably indicate that a State which knowingly uses its territory or allows its territory to be used for acts contrary to the rights of other States commits an internationally illegal act. Every State and its nationals are entitled to live without any fear of injury from the neighbouring States and if the neighbouring States carry on activities which will endanger the

safety and well-being of that State, there would be, it appears, a violation of the basic principles of international law, although no claim for reparation would arise, unless actual damage or injury is caused.

II. (*b*) A State carrying out nuclear tests in its own territory would, we feel, be abusing its rights in respect of use of its territory. As already stated, a State cannot indulge in acts which cause or are likely to cause damage either to its own nationals or nationals of the neighbouring countries on a large scale.

III. (*a*) Scientific research has established beyond all reasonable doubt that explosions of nuclear devices thus result in pollution of the air with radioactivity, thereby creating atmosphere injurious to the health of the peoples within the neighbouring zones. The principle in the *Trail Smelter Arbitration* ought to be applied to such a situation. It is true that the award in the *Trail Smelter case* cannot in isolation be regarded as laying down a positive principle of international law to cover all situations, but it is undeniable that the principle ought to be applied to injury caused by nuclear tests. We draw attention here again to the implications of the preamble to the Charter of the United Nations and the Universal Declaration of Human Rights which ought to be regarded as formulating new principles of international law, if not declaring the existing principles.

III. (*b*) The damage which the nuclear tests are likely to cause or cause is not merely actual damage but also potential damage or delayed damage. Scientists have told us in unmistakable terms and the proposition is abundantly demonstrated by the events which followed the tragic atomic bomb explosions in Nagasaki and Hiroshima (about which our distinguished colleague from Japan will bear testimony and also enlighten us in greater detail), that even years after the explosions the effects of radiation manifest themselves in human bodies. Diseases like leukeamia and genetic diseases appear not merely after a victim is exposed to radiation but a long time thereafter. It is, therefore, not correct to say that actual damage has to be established for the claimant State to base an action on commission of an international tort. In this connection it would be useful to mention that the Draft Convention on Civil Liability for Nuclear Damage, which has been drawn up under the auspices of the

International Atomic Energy Commission by legal experts, of several countries and revised by representatives of many countries does take notice of the delayed effects of radioactivity and provides for compensation even in anticipation of the damage so far as the guilty State is concerned.

III. (c) Even if the harmful effects resulting from contamination of the air are confined within the territory of the experimenting State, that State must be regarded as having violated the human rights of its citizens and aliens living within its territory. As already stated, the sovereignty of the State is to be regarded as having been curtailed to this extent, and the State ought to be deemed to be abusing its sovereignty in out carrying such dangerous experiments. The question whether the State is responsible for the harm caused to the aliens residing in its territory has already been dealt with. Apart from that, it has been scientifically established that the harmful effects of contamination of the air cannot be controlled to any particular area. We may quote, in this connection, the explosion at Bikini Atoll. Radiation and radioactive material released by the explosion caused contamination far beyond the area defined as the warning zone by the exploding State. The fate of the Japanese fishing vessel Lucky Dragon is another instance of miscalculation of the danger area.

IV. As the leader of our Delegation made it clear in his statement at the Tokyo session, the question whether the use of atomic weapons in a war is legal or not is not for the consideration of this Committee, and we do not propose to express any views thereon. We are, however, of the firm belief that the tests carried on for the manufacture and perfection of atomic weapons involve widespread danger to life and property and are therefore illegal. Proof of damage is unnecessary; the possibility of damage which is unpredictable is sufficient to condemn the tests as illegal. The stoppage of such tests is undoubtedly a matter of international concern, as is evident from the fact that even the great Nuclear Powers have engaged themselves in exploring ways and means to establish cessation of such tests.

V. An injunction for stoppage of nuclear tests is indeed necessary. The International Court of Justice has the power to indicate, if circumstances so require, provisional measures which ought to be taken to preserve the respective rights of either party (vide Article

41 of the Charter). We feel confident that if occasion arises for the International Court of Justice to decide the question of legality of nuclear tests, proposed to be carried out by any State, the Court would not hesitate to grant an injunction. The question of reparation comes after the event, and it is no solution to the real issue which is to save humanity and property from damage and destruction.

VI. It is certainly a violation of the principles of international law if a nation carrying on nuclear tests marks off certain areas as danger zones and thus prevents the exercise of the freedom of air or sea navigation. It is not necessary to repeat in any detail that every nation has the right to navigate in the high seas and to fly over the high seas. This freedom has been recognised for quite a long time and has been implicitly reaffirmed in the latest conventions on the Law of the Sea. An express provision is made in one of these Conventions that a State shall not pollute the waters of the high seas—it is merely a declaration of the existing rule of international law.

VII. If nuclear tests result in destruction of the living sources of the sea, the testing nation does violate the principles of international law. The living sources are a common property of all nations and no nation has a right to destroy them or to injure them in any way.

VIII. A trustee authority which holds territories on trust from the United Nations has no right to use the trusteeship territories for the purpose of holding nuclear tests. Any such activity is clearly contrary to the basic objectives set out in Articles 73 and 76 of the Charter of the United Nations.

Indonesia : The Indonesian view regarding the legality of nuclear tests has already been presented to the Committee by the Indonesian Delegation during the Tokyo Session last year. However, I may be permitted to make a few additional observations regarding some aspects of the matter under consideration, based upon the report prepared by the Secretariat.

Firstly, regarding nuclear tests on the metropolitan territory. Nuclear weapons tests within the metropolitan territory or national territory of a State involve the principle of State sovereignty and

the principle of State responsibility. It is widely admitted that a State is sovereign in its own territory including the airspace above it. From this point of view, it seems to follow that a State can conduct nuclear weapon tests within its own territory. But this is not the case, because the soveiregnty of a State should not be such as to cause harm to others. Nuclear weapon tests conducted within a metropolitan territory of a State can easily cause harm to the rest of the world. Here, the question of State responsibility plays an important role. In fact, it should override the consideration of State Sovereignty. Thus nuclear tests within a territory of a State should be regarded as illegal because of the potential threat to vital interests of others.

Nuclear weapon tests may pollute the air above and beyond the territory of the State because the radioactive materials may be deposited high in the stratosphere and may be swept away to other parts of the world by prevailing winds. Admittedly, international law at pesent has not yet defined the height of the "airspace" over which the terrestrial State has sovereignty. It is, however, generally admitted that "airspace" does not include "outer space". Thus the damage to flights in the outer space in the future, should the nuclear weapon tests still be conducted, would also necessarily belong to the responsibility of the terrestrial State which carries out the tests. The radioactive materials could also spread to the "airspace" of other States or the "airspace" above the high seas. Should the fall-out cause damage to other States or their nationals, or to a ship or aircraft navigating the high seas or the "airspace" above the high seas, it is my Delegation's opinion that the damage should be the responsibility of the State which carried out the nuclear weapon tests.

As regard the nuclear weapon tests on non-self-governing territories, it is the opinion of my Delegation that though dorment, the sovereiguty over the territory rests with its native people. The administering State can be considered as being vested temporarily with the attributes of that sovereignty. In administering the non-self-governing territories, a State has to comply with the Charter of the United Nations. Under Article 73 of the Charter, the administering State has accepted as "a sacred trust the obligation to promote to the utmost....the well-being of the inhabitants of these territories." One should be very cynical indeed to contend

that nuclear weapon tests are carried out on non-self-governing territories to promote the "well-being of the inhabitants of these territories."

In the opinion of my Delegation, nuclear weapon tests on non-self-governing territories must be regarded as illegal because they are definitely contrary to the Charter and the spirit of the United Nations.

If nuclear weapon tests on non-self-governing territories are regarded as illegal, the tests on trust territories should be even more so. The administering State of the latter does not have a sovereignty over the area, and its legal capacity is even more limited than the former. The administering State of a trust territory is more than an agent of the Trusteeship Council.

I would like to mention in this connection the concept of "strategic areas" in the trusteeship system. Among the trusteeship agreements made so far, I think, only one contains the clause of the "strategic area." This was the agreement regarding the trust territory of the Pacific Islands. In this "strategic area" the trusteeship agreement of 1947 allowed the administering State (the United States of America) to close certain areas for security reasons. The United States in this very area detonated hydrogen bombs in 1954. As the result of the explosion, many islanders were exposed to radioactive fall-out. I may again refer to the Secretariat's report for the effects of the test on the people of the islands. Their sad story has been well reflected in the Secretariat's report.

The issue I want to submit is, whether the concept of "strategic area" may justify the administering State to conduct nuclear tests on trust territories. Although the clause may grant the State the right to build military bases, it is the opinion of my Delegation that it does not give them the right to carry out the explosion of nuclear weapons on those territories.

The Geneva Convention on the High Seas, 1958, stated that the freedoms of the sea included, inter alia, the freedom of navigation, the freedom of fishing, the freedom to lay submarine cables and pipelines, and the freedom to fly over the high seas. However, there has not yet been concluded an international agreement as to the legality of nuclear weapon tests on the high seas. A resolu-

tion on nuclear tests on the high seas, adopted at Geneva on April 23, 1958, recognized the fact that "there is a serious and genuine apprehension on the part of many States that nuclear explosions constitute an infringement of the freedom of the seas". A nuclear test on the high seas will definitely cause hazards to the fisheries of many nations. The essential question here is whether the freedom of the, high seas can be used so as to create damage to other peoples' interests, and my Delegation is of the opinion that it cannot be used to that end. The explosion of nuclear weapons on the high seas should be prohibited.

If these experiments and tests continue, it would be difficult to maintain that they will not infringe upon the recognized freedoms of the high seas. Navigation will be halted, fishing will be suspended, submarine cables and pipelines may be affected, the freedom to fly over the high seas will seriously be interrupted, and the waters and the air of the high seas will definitely be polluted. These freedoms are designed for the benefit of mankind, and definitely not for the convenience of one or two States, detrimental to the legitimate interests of the rest of the world.

Therefore, taking into consideration the effects of the detonation of nuclear weapons, the tests on the high seas cannot be regarded as legal. They cannot be regarded as a legitimate and justified use of the high seas. It is an infringement upon the freedom of the high seas and upon the safety of mankind.

There is one more aspect of the nuclear weapon test which should be considered : how it is conducted. The tests can be carried out in the air, on the surface, underground, and underwater. As to tests carried out in the air and on the surface, both kinds of tests have practically the same destructive effects and both produce radioactive materials which are dangerous to human life. It is safe to say, therefore, that such tests are illegal. Considering its effects on fisheries and navigation, underwater nuclear tests may also be included in this category.

As to underground nuclear explosions, however, it may be contended that they may not have the destructive effects comparable to the air and surface explosions, that at least its effects are harnessed within the relatively strong concrete. Also, the radioactive materials

as a result of the explosion may not endanger human life because they are contained deep in the ground. Yet, the underground tests are elements in promoting the notorious arms race. Politically, as I will discuss presently, all nuclear weapon tests are inadmissible including the underground tests.

We still remember clearly Hiroshima and Nagasaki. The sacrifice of hundreds of thousands of Japanese lives during the bombing of Hiroshima and Nagasaki caused widespread alarm with regard to the destructive power of nuclear weapons. From that time on, the status of atomic weapons can no longer be classified as ordinary "conventional" weapons. The problem of nuclear or atomic weapons testing, therefore, cannot be regarded as just another experiment in physical science.

Moreover, nuclear weapon tests are not only the problem of countries belonging to the nuclear club alone. If the tests are not barred, sooner or later, the nuclear weapon tests will also be conducted by the present have-not States. If the nuclear powers continue their tests, the have-not States will always be tempted to have nuclear weapons of their own. Since generally the nuclear powers would not willingly give such weapons to the have-not States, the result of all this would be that more tests will be conducted by have-not States for their own nuclear weapons, and this will cause more harm to mankind.

Nuclear weapon tests also intensify the arms race within the framework of the cold-war. As long as the cold war continues to exist, no party in the controversy will let itself be overmatched by the other. Both the United States and the Soviet Union prefer to negotiate on the problems of East-West tension "from a position of strength". This means that any development in nuclear weapons on one side will almost automatically be followed by nuclear testing by its opponent. It is not difficult to see that this kind of dangerous "balance of power" is based on a precarious basis, and that international tension will continue to grow as long as nuclear weapon tests continue, whether in the air, on the ground, on the high seas, underground or underwater.

The great dilemma today seems to be the contradiction between what is considered the necessity for national preservation on the

one hand and the necessity for the safety of mankind and civilization on the other. From the political point of view, therefore, the crux of the problem of nuclear tests is the cold war.

After making these observations, I will be very brief in answering the questions formulated in the Topics for Discussion.

I (*a*) Yes.

(*b*) Yes, with the provision that such reparation will not exceed reparation paid to the nationals of the State concerned.

(*c*) Yes.

II (*a*) First part—yes

Second part—it is contrary to international law.

(*b*) Yes.

III (*a*) Yes.

(*b*) Actual damage should be proved.

(*c*) Yes.

IV It is my Delegation's contention that nuclear weapons *per se* are illegal. This view is based upon the following considerations :

1. That they are "poisonous" and thus contrary to the Hague Regulations (1899 and 1907) and the Geneva Gas Protocol of 1923 prohibiting the use of poisonous gases in warfare.

2. That the use of the nuclear weapons is a crime against humanity, because it covers destruction of civilian population in time of war, thus contrary to the established rules of the law of war.

3. That its total character may destroy a large number of people indiscriminately and is thus contrary to the established rules of the law of war.

4. That its total character may destroy a large number of people indiscriminately and is thus contrary to the Genocide Convention of 1948 which prohibits the destruction, in whole or in part, of national, ethnical, racial or religious groups.

5. That its effects on the civilian population are contrary to the Geneva Convention (IV) of 1949 on the Protection of Civilian Persons in Time of War.

Since nuclear weapons used both in warfare and in tests have almost the same destructive and radioactive effects, it may also be possible to deduce from this that nuclear weapon tests too are illegal. The stoppage of the tests can certainly be considered a matter of international concern.

Allow me to recapitulate briefly the main points of the position of my Delegation regarding nuclear tests :

My Delegation is of the opinion that nuclear weapon tests are illegal, no matter where they take place or by whom they are carried out and under whatever circumstances. Nuclear weapon tests should be prohibited and discontinued. The use of nuclear energy should be restricted to peaceful purposes only. We are of the opinion that damage caused by nuclear tests should be the responsibility of the State which carried out the tests. The findings in the *Trail Smelter Arbitration* can be used as a legal basis. Though, in principle, claims should be based on actual damage, it has to be kept in mind, however, that it will be very difficult to make an assessment, especially in terms of money, of material damage to life and health of human beings, animals and plants or of the genetic effects of the tests. Moreover, it is quite possible that the damaging effects will only be manifest after a certain time, perhaps years after the tests.

It is tempting to say that the problem of nuclear tests is essentially a political problem, rather than a legal one. Indeed important political issues are involved, perhaps even predominantly so.

From the legal point of view it would be ideal if nuclear weapon tests could be conventionally outlawed by an international convention. I wonder, however, whether under the circumstances, with cold-war issues polluting the international atmosphere, that ideal could materialize. But my Delegation sincerely believes that the Committee's findings regarding the legality of nuclear tests will be of great importance and will mean a concrete and valuable step in the right direction towards

achievement of that ideal. I may, therefore, be permitted to express my Delegation's earnest hope that the Committee will be able to establish unequivocally the illegality of nuclear weapon tests and if the Committee decides to formulate a resolution in line with its findings, my Delegation is prepared to support such a resolution.

Burma : The subject of nuclear tests is not new or unfamiliar but that branch of international law which we wish to invoke in pronouncing such tests illegal is new and unexplored. Nuclear tests have gone on for many years and upwards of more than 100 tests had already been made before the great Indian leader, Mr. Nehru, put upon himself the task of questioning their legality.

The forum of this Committee is hardly the place for dramatic pronouncements of moral condemnation of tests, but we can easily understand the appeal made by the Japanese Delegate last year to humanitarian considerations for declaring these tests illegal. Humanitarian considerations would forthwith lead our thoughts to the condemnation of the use of nuclear weapons in time of war on the basis of the many declarations beginning with the Declaration of St. Petersburg of 1868 to the Geneva Convention of 1949. For in all these international conventions the use of weapons of mass destruction was prohibited.

In the present discussion this aspect of the matter does not call for consideration as our immediate concern is with the legality of nuclear tests only. The Committee has before it the 1956 and 1958 Reports of the United Nations Scientific Committee on the Effects of the Atomic Radiation, the extracts from the 1958 Reports on the Hazards to Men of Nuclear and Allied Radiations prepared by the British Medical Research Council and the Draft Convention and Commentaries on Civil Liability for Nuclear Damage of the International Atomic Energy Agency of 1960.

These investigations had been conducted with a view to safeguard the population from the dangers and hazards arising out of the use of atomic energy for peaceful purposes, but even after reading these reports we are left with the impression that the injurious effects of atomic radiation and fall-out must necessarily present a source of perennial danger to the life and integrity of the human

species accustomed as they have been to the natural radiation since the beginning of the world.

The dangers arising out of nuclear explosions, as described in the scientific papers placed at the disposal of the Committee, are grim and foreboding. We are not sufficiently informed of the evil effects of radiation resulting from underground tests, but those tests carried out in the atmosphere and in the seas had given rise to hazards long distanced both in time and space resulting from radiation and fall-out. These results are not confined to the territories of the testing countries. The spread and increase of radioactivity are global in character and the fall-out rising into the stratosphere scattered on to the distant regions of the earth within a space of several years.

Both radiation and fall-out are capable of causing what has been scientifically described as somatic and genetic effects on the human body. While somatic effects may cause harm to the individual person during his life time, genetic effects would extend to future generations. These results would appear to have been confirmed by the experience of the Japanese victims both of last War and of the tests conducted in the Pacific Ocean.

Satisfied as we are with the truth of the scientific investigations carried out in respect of local and global radioactive fall-out from nuclear test explosions and the biological and genetic effects of such fall-out and radiation, the question naturally arises as to what action the people living and working in peace in the far distant lands should take by way of seeking redress for the wrong suffered by them. In the circumstances, the State of which these victims are nationals must necessarily appeal to international law and fix the responsibility for redress on the State which conducted the nuclear tests. As already remarked, this particular branch of State responsibility has not been previously explored to the extent of obtaining well settled principles of liability.

There can be no doubt whatsoever that the principle of State responsibility must be extended to afford relief and satisfaction to the States to which the victims of atomic radiation and fall-out belong. Such extension of these principles was foreseen by Oppenheim who, at page 342 of his treatise on international law remarks : "The increasing complexities of modern international relations, in particular having regard to the unlimited potentialities of scientific

weapons of destruction, may call for far-reaching extensions of individual responsibility expressly declared by international law." The learned author was thinking of the violation of law in respect of international control of atomic energy by individuals and not by States. At page 343, the learned author states that an act of the State injurious to another, if wilfully committed, is an international delinquency.

State responsibility may also arise through an abuse of a right enjoyed by virtue of international law, and this occurs when a State acts in an arbitrary manner and inflicts injury upon other States not justified by legitimate considerations of its own advantage. On the same principle the duty is cast upon the State not to interfere with the riparian rights of other States.

These legal principles have already found expression in a number of cases before courts and tribunals in a number of countries. The *Trail-Smelter Arbitration* Tribunal arrived at this conclusion enunciating the principle in the following terms :

> "Under the principles of international law, as well as the law of the United States, no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequences and the injury is established by clear and convincing evidence."

The damage in this case was done to the crops, pasture lands, trees and agriculture generally as well as to livestock as the result of sulphur dioxide fumes emitted from a smelting plant in British Columbian Canada. The tribunal in the circumstances held the dominion of Canada liable on the ground that there was a violation of the obligation to protect other States from injuries emanating from its territories and this violation constituted an abuse of right, an unlawful act. The facts giving rise to the *Trail-Smelter Arbitration* have very close affinity to those arising out of the undertaking of nuclear tests by a State within its own territory, and it is submitted that the principles of state responsibility laid down in the said case can with equal justice be applied to the conducting of nuclear tests.

In seeking to extend the principle of municipal law, we must take into account the well known dictum of Westlake that "the duties

and rights of States are only the duties and rights of the men who compose them and it is scientifically wrong and practically undesirable to divorce international law from general principles of law and morality which underline the main systems of municipal jurisprudence regulating the conduct of human beings."

Thus, to solve the problem set before this Committee, it should, as set out in the Statute of the International Court of Justice, seek its guidance from the "general principles of law recognized by civilized nations", viz., the general principles of municipal jurisprudence, and in particular, of private law in so far as they are applicable to relations of States.

The Committee's Secretariat has placed materials before us of sufficient weight to enable the Committee to come to the conclusion that a State conducting nuclear tests within its own territory is, under international law, guilty of an act of international delinquency. The Committee has been referred to the principles of tortious liability adopted by the various systems of law. The accepted principle in Anglo-American law is that it is wrong to do wilful harm to one's neighbour without lawful justification and excuse. The same principle is recognized by France in Article 1382 of the *Code Napoleon*, by Italy in Article 2043 of the *Italian Civil Code* and by Germany in sections 823 and 826 of the *German Civil Code*. The *Swiss Code* also incorporates the same principle in Article 41, and Soviet law observes this principle of law in Article 403 of the *Soviet Civil Code*.

This law of liability for unlawful harm is based on the principle of fault, but in more recent times this principle of fault has been qualified by the application of the principle of absolute liability in respect of dangers created by the respondent. The English case of *Rylands v. Fletcher* is in point for it lays down "A person who for his own purposes brings on his land and collects and keeps there anything likely to do mischief, if it escapes, must keep it in at his peril, and, if he does not do so, he is *prima facie* answerable for all the damage which is the natural consequence of this escape." In the American law of torts this principle of liability for ultra-hazardous activities is stated in these words :

> "One who carries on an ultra-hazardous activity is liable to another whose person, land or chattels the actor should recognise

as likely to be harmed by the unpreventable miscarriage of the activity for harm resulting thereto from that which makes the activity ultra-hazardous, although the utmost care is exercised to prevent the harm."

The principle of absolute liabilityfor dangerous things is found accepted by the major legal systems of Europe and America. The Islamic Book of rules of justice, *Majalla* in Article 1197 provides "no person may be prevented from doing as he wishes with his property unless in so doing he should cause grave damage to other persons."

The African customary law does not diverge widely in its essentials from the accepted concepts of the common law. The Chinese and Japanese law also recognise the principle of absolute liability for dangerous things. The Burmese law, based as it is on the English common law, similarly recognises this principle. Dr. E. Maung in his *Expansion of Burmese Law*, (1951 page 56) mentions that even before the common law came to impinge upon the native customary law, it was a recognised principle that a person has the duty to act so as to avoid injury to others even though in the exercise of one's right. Hence a person felling trees on his own land adjacent to another's holding was liable in damage for the injury caused to buildings. human beings and animals on the adjoining land.

It would thus appear that this agreed principle of tortious liability recognised in all the major legal systems of the world can readily furnish the source from which international law can draw in enunciating its own rules and principles with regard to international torts and tortious liability. Adopting this principle this Committee should share the view that a State harbouring dangerous things on its territory or carrying out dangerous experiments within its territory should be held liable for damage or harm caused to neighbouring State.

In regard to the nuclear tests carried out in the open seas. it has been said in some quarters that the interference caused to navigation is negligible and the harm done to the living resources of the sea is slight and that these disadvantages were far outweighed by the resulting advantage of keeping the would-be enemy of world peace in constraint. But such a bland reason cannot possibly appeal

to this Committee. The end does never in law justify the means. The introduction of such a concept into the municipal law would result in grave injustice to the victims of the illegal act. The same result would undoubtedly follow if such a view be adopted in the realm of international law.

The high seas are not subject to the sovereignty of any one nation. The reservation of immense areas of the open seas for nuclear testing purposes must necessarily result in the denial of the right of other nations to navigate in the area. The power of the latest explosions is such that vast areas of the open seas would for a considerable length of time be placed out of bounds—so to speak—to international shipping as well as to fishing operations. Thus if nuclear testing be permitted in the high seas, the four freedoms of the sea recently adopted by the international convention would certainly lose their meaning and purpose.

The United Nations Convention on Fishing in Article I lays down the general principle that, subject to regulations relating to conservation of the living resources of the sea, all States have the right for their nationals to engage in fishing in the high seas. Articles 24 and 25 of the convention adopted by the U. N. Conference on the Law of the Sea require States to take steps to prevent pollution of the sea by oil and radioactive waste and other harmful agents. The tragic experience of the Japanese fishing fleet shows how substantially the fishing waters could be polluted and how the living resources of the sea could be destroyed as a result of nuclear testing conducted on the high seas. In the face of these grim facts' this Committee is bound to agree that nuclear testing in the high seas is illegal as being contrary to the four freedoms of the sea settled and agreed to under the U.N. Convention on the Law of the Sea.

Japan : Events which took place since our Tokyo session do not show any sign of optimism regarding nuclear tests. Two months after the Tokyo Conference, France conducted her fourth nuclear test. Last autumn, when efforts had been made for bringing negotiations at Geneva to a successful conclusion, the Soviet Union resumed a series of nuclear tests, which culminated in the detonation of the 50 megaton bomb, despite a solemn appeal by the United Nations. Following this Soviet resumption, the United States of America decided to undertake laboratory and underground nuclear

tests. It has recently been reported that she is planning mid-air nuclear explosions.

The Japanese Government lodged protests with the French Government on April 27, and with the Government of the Soviet Union on September 2, October 20, October 25, and again on October 30. She also made a protest to the Government of the United States on September 6.

At the United Nations last autumn, the Japanese Delegation took an active part in the six power draft resolution on the suspension of nuclear tests. Japan also made efforts for the adoption of a resolution on the conclusion of a test ban treaty under effective international control.

As mentioned in a general statement in the previous session, Japan's repeated protests and her other actions are based mainly on humanitarian considerations and the broad conception of safeguarding world peace, and not on the technical question of illegality of such tests.

The steady increase of radioactive fall-out is certainly a matter of great concern to us and to entire humanity—a matter which is also highly relevant in the consideration of the legality or otherwise of nuclear tests. However, even if the scientists should fail to prove actual damage done by radioactive fall-out, or even if they succeed in inventing the so-called "clean bombs", nuclear tests are fraught with serious danger to world peace. They create suspicions and accelerate an intensive armament race in nuclear weapons, which is itself a great menace to world peace.

The problems before the Committee, however, are technical legal problems. Such problems are fit to be discussed not by moralists or politicians, but by trained lawyers alone. A nuclear test, damage, reparation of damage, preventive remedies etc. are very much like tort problems in domestic law familiar to ordinary lawyers in civilized countries.

The countries conducting such a test may indeed believe in all honesty that in view of the present state of international affairs such measures are absolutely necessary for guaranteeing the security of their own countries or for the defence of the Free World or of the Communist world, as the case may be. In the absence of international treaties banning nuclear tests, their position may be regarded as similar to the position of a lawful industrial enterprise utilizing nuclear energy which is equally fraught with dangers to the community at large. The municipal laws of civilized countries have provided for strict liability along the lines of *Rylands* v. *Fletcher* in Anglo-American law, or a similar principle of *Gefaehrdungshaftung* in Continental law, i.e. liability without any proof of carelessness for created hazards, which, it seems, has already been accepted in the countries of Euratom and of the Organisation for European Economic Co-operation in the case of nuclear danger. May not similar principles be accepted in the case of damage arising out of nuclear weapon tests, as falling under the "general principles of law recognized by civilised nations?"

It is submitted that the question be discussed without a show of political air and without any suggestion of moral condemnation of any of the countries concerned. These are problems which must be tackled by lawyers, as in cases where they deal with domestic legal problems of a civil law character, dealing with the incidence of loss or the prevention of damage.

The concept of *delict* or tort has a nuance of moral condemnation, having been associated in the 19th century with the idea of *culpa*. The French place this strict liability under a separate caption *Quasi-delict*, and Judge Smith of the Harvard Law School wanted to keep this strict liability separated from tortious liability.

Japan: [Further Views]:

The problem of nuclear weapons tests can only be solved by the complete banning of such tests. This can be effected by agreement by the testing states to cease to make such tests. This connotes big political actions on their part which are of course a thing of prime importance. As the distinguished observer from the United Nations correctly stated, the sheer inquiry into the legality of such tests will not solve our problems.

The United States of America have made the tests with the belief that such measures are absolutely necessary for the defence not only of herself but also for the defence of the Free World, and the Soviet Union is making such tests probably believing that such tests

are necessary for the defence of the Communist World. I hope that mankind will through Hobbesian logic come to have a government which can control the dangerous actions of the testing States leading to mutual destruction. But at present the world is not so organized, and international law presupposing a society of sovereign States is incompetent to control their actions. This does not mean, however, that it is meaningless to deliberate on the legality of nuclear tests. The examination shows that there is a wide divergence between the rules of positive law so far evolved and the sentiments of justice of mankind in general. There is, to use a classical phrase, a conflict between positive law and natural law. In our inquiry into problems before the Committee, we should use two distinct methods. What are the present rules, and what ought to be the rules which ought to be the international law. For instance, when we consider the question of compensation to be paid to the injured party, we can more easily introduce the principle of strict liability into the international field through the doctrine of civilized jurisprudence. But it will be found that when we come to the question of preventive remedies, international law as presently established is incompetent to bring the international rules to the level of the more complete remedies recognized by municipal laws of civilized nations, until political organization of international society witnesses a radical change.

Such, in brief, is the viewpoint of the Japanese Government in considering the legality of nuclear tests in various forms which are considered by the Committee.

The answers of the Government of Japan to the questions formulated in the Topics of Discussion are as follows :

I (a) A State that has carried out the tests ought to be responsible for direct damage caused by them under the internal law of the State.

(b) A State that has carried out the tests and caused such damage is liable to pay reparation to the injured alien's home State, provided that local remedy has been exhausted.

(c) When damage was caused to a person who was outside the territory of the State carrying out the tests, the injured person's home State can demand from the former reparation under the principles of State responsibility.

II (a) & (b) With regard to questions (a) and (b), extent to which the neighbouring States are endangered should determine such a question. If the danger of causing damage to the neighbouring States is beyond doubt and over-whelmingly great, the State is exercising its territorial right to such an extent as will constitute an abuse of right under International Law.

III (a) The State carrying out such tests is to be held responsible for the pollution of air in accordance with the principles laid down in the *Trail Smelter Arbitration* case.

(b) Under the existing international law, it would be necessary for the claimant State to prove actual damage.

(c) With regard to the first question, it would depend on the nature and extent of the harmful effects resulting from contamination of air. As for the second question, the answer would be in the negative as long as the benefit of local remedy is assured.

IV The use of atomic weapons in time of war, when it causes an indiscriminate destruction of life and property, violates, at least by analogy, the existing rules of customary and conventional international law, as embodied, for instance, in the provisions of the Hague Regulations of 1907 and the Geneva Protocol of 1925. For the second question, holding of nuclear tests or the manufacture of atomic weapons cannot be said to be illegal by itself. In respect of the last point, stoppage of nuclear tests is indeed a question of universal concern.

V Under the existing International Law, there is no recourse but to ask payment for the damage resulting from nuclear tests.

Where the case has been referred to an international court, an injuction by the court for stoppage of such tests should be necessary upon application.

VI The answer depends on the case. To establish the area of danger zones, without giving reasonable consideration to the interests of other nations in the exercise of the freedom of the high seas, and in such a way as to interfere with

international traffic and fisheries, is a violation of the principles of International Law.

VII It is a violation of International Law to carry out nuclear tests in such places and in such manner as will obstruct or adversely affect the fisheries of other nations on the high seas.

VIII To carry out nuclear tests which will affect the advancement of the inhabitants of the trust territory is to be considered as contrary to the general purposes of the trusteeship system.

In making these answers the Japanese Government wishes to emphasise that humanitarian consideration should be given a priority over the technical aspects of the legality of nuclear tests. The answers, therefore, shall not prejudice the position of the Japanese Government based on such consideration with regard to any particular nuclear tests in the future as well as in the past.

Pakistan: Today, when a blanket of nuclear war clouds is menacing the whole human scene, a searching reappraisal of the code of conduct that governs international relationship is a demand upon mankind. Man's progress from the cave to outer space will become meaningless in this international age if we cannot ultimately evolve a code of conduct with common objectives for all nations, based upon the rule of law. Due to scientific developments our planet has become much too small and it has become much too dangerous for it to be ruled by anything but law. As long as the rule of force retains its paramount position as a final arbiter of international disputes, there will remain always the possibility of war by miscalculation. I cannot see how we can hope to secure peace in the world except by establishing law between nations and equal justice under the law.

We are living at a decisive moment in the history of man. Rapid and dramatic changes in the technical and scientific fields, too numerous to enumerate, daily defy evaluations on the basis of outmoded slogans and outdated interpretations. At a pace beyond imagination the whole pattern of existence is being reshaped. Mere guidance from hidebound political doctrines may not provide firm footholds for the dynamic present and an uncertain future. Age-old barriers such as seas and mountains, weather and climate and space are fading into relative insignificance.

As we listen to the roar of current history, every day that passes, its call seems more clear that mankind, men and nations-races and colour-must learn to live together or they may have to perish together.

Man has learnt how to destroy the world-he must now learn how to save it for an honourable, just and true peace for free man in all countries before the sands of time run out, and the civilization as we know it is buried underneath it.

The peace we have today, as has been rightly said, is a peace maintained by retaliatory terror. This is not a peace without fear. Man is tied to the wheel of fear. The faster the wheel moves, the greater is the psychological strain and unbalance in man's life.

As I have observed earlier, the old complacent faith of man about his future has given way to doubt. The doubt has now passed into alarm. The feeling of alarm is heightened by the erected walls of hatred and by the nature of conflicts and controversies that plague the world.

The genetic, biological and other effects of nuclear radiation have been studied and commented upon, from time to time, by the United Nations scientific agencies and by other scientific bodies.

It is estimated that about one hundred and thirty nuclear tests have so far been carried out in various parts of the world over the past fifteen years. Each nuclear test has added its quota of radioactive material to the land, the sea and the air, and the scientific evidence collected and set out in Chapter I of the Report of the Secretariat has shown that the general contamination of the world by radioactive substances is in the process of having its biological and genetic effects on the human race. The indefinite continuation of nuclear tests and pollution of the atmosphere, land and water all over the world may seriously affect the life and health of the populations of all countries. If the nuclear powers continue testing nuclear weapons, the non-nuclear States may have to consider the question as to whether the testing States are liable in international law for the damage caused by these tests. Even if the tests are carried out within the territory of the testing state and even if the tests do not cause any immediate damage to neighbouring States, every test carried out may still have harmful effects on the rest of the world by its contribution to the quota of harmful radioactive substances in the

air, the land and the sea. This is so because every nuclear explosion results in the radioactive fission products being drawn into the stratosphere and these fission products gradually spread out over a large part of the world and return ultimately to the earth in the form of rain or snow. The estimates of the time for this return have recently been sharply revised. Whereas in earlier official discussions on fall-out the average length of time which the radioactive particles would spend in the stratosphere was reckoned at ten years, the actual time is now estimated by scientists to be two to three years. Consequently, the radioactive materials from over one hundred nuclear tests have already returned to the earth with their radioactive pollution. The tests of nuclear weapons so far have already distributed sufficiently extra radioactivity over the world to be detectable by instruments of precision. Every nuclear test spreads an additional quota of radioactive elements over every part of the world and each added amount of radiation may cause damage to the health of human beings all over the world. It is, therefore, a pertinent point to consider whether the nuclear powers are liable under international law. International morality demands and international law may require the cessation of nuclear tests.

The logic of the whole situation, however, demands a political solution without which all discussions on the subject may have purely an academic significance with no particular influence on the policies of the nuclear powers.

A great nuclear power violated the moratorium and in disregard of world public opinion started its tests of the monster megaton bombs. This has started the inevitable chain reaction of further nuclear tests by other nuclear powers.

It is not enough therefore to approach the question of the cessation of nuclear tests from a purely academic legal point of view. The hard realities of political life have to be taken into account for making our declarations of any practical significance and value. Failure to recognise the hard realities of political situation will lend an air of unreality to our academic deliberations. We have to recognise that mere declaration by us, that nuclear tests are illegal, will not bring about a cessation of the tests. We have further to consider whether the question of cessation of nuclear tests without an effective and proper method of inspection and control can in any

sense help towards the solution of the real problem. Voluntary ban on tests without inspection and control may afford an opportunity to the more unscrupulous nuclear powers to make secret preparation for gaining technical and tactical advantages in the nuclear field, which inevitably will start the vicious circle of further nuclear tests by others all over again. It seems obvious that none of the nuclear powers are agreeable to abandon their own concepts of their national security and their own theories on balance of power and retaliatory terror.

It may be safely asserted, in spite of possible views to the contrary, that nuclear tests, broadly and generally speaking, to the extent they endanger the health, safety and security of life-human and otherwise and to the extent it imperils the security of this planet and the survival and continuation of life on earth-they are illegal and most certainly immoral without any doubt.

I draw the attention of the Committee to the *Trail Smelter Arbitration Case* (*United States* vs. *Canada*). The *Corfu Channel Case* and the *Fletchers Case* have also been quoted. The legal principles established in those cases are rationally valid and correct and it may be said that they may have their application to the topic under discussion.

To us, above all, it is the supreme crisis in human civilisation. It represents a deep crisis in the development of the human life and thought. Man is faced with a moral crisis of the highest magnitude. The question is, whether we would allow our lives, our civilization to continue to grow and flourish or in our insane attempt to impose a particular system of life we would risk even the destruction of the human species from the face of the earth. This is an acute moral problem and anything that goes to help to solve this problem, will earn our heartfelt approval.

I had occasion to observe earlier and I take the opportunity of reiterating it again that whether we would respond to the challenge of our age, and evoke adequate spiritual, moral and emotional responses from the depths of our being to re-discover the real meaning and purpose of life and help man channelise his efforts in the direction of organizing a peaceful, just and free world within the framework of world order, where men and nations may live without fear,

under the law, with equal justice for all, refusing to sacrifice the human destiny, as a moral being, has a mark of interrogation, which the Asian-African continents need answer from the depths of their ancient wisdom, for the salvation of man.

We shall therefore lend our full support to any resolution that may call for a ban of nuclear tests.

Our answers to the questions formulated in the Topics for Discussion are as follows:

Question I	(a)	—	Yes.
	(b)	—	Yes.
	(c)	—	Yes.
Question II	(a)	—	Yes.
	(b)	—	Yes.
Question III	(a)	—	Yes.
	(b)	—	On proof of actual damage only.
	(c)	—	Yes.
Question IV	(i)	—	Not illegal-Proof of actual damage.
	(ii)	—	Yes.
Question V		—	Not sufficient. Injunction is necessary.
Question VI		—	Yes.
Question VII		—	Yes.
Question VIII		—	Not lawful.

Thailand: I wish to make the following observations which represent the personal views of my humble self. I shall confine my remarks primarily to the legal aspects of the problem.

The title "Legality of Nuclear Tests" is misleading in the extreme. I hope we are not called upon to establish the legality of nuclear tests, nor indeed their illegality. To state that it is legal to have nuclear tests is certainly not the purpose of this Conference; on the other hand, to say categorically that nuclear tests are in

themselves and by themselves illegal is to state an ideology or a wishful thinking rather than a realisable condition of facts in the modern law of nations. The most that could be done and should indeed be done would be to bring all nuclear tests under the control and rules of international law.

Nuclear tests are at present uncontrolled and uncontrolled nuclear tests are unnecessary evils. They are uncontrolled in the sense that scientifically they are not controllable. That is why they are called tests or experiments. That is why it sometimes happens that the explosion encompasses far greater area of destruction than expected or calculated or indeed planned by scientists. Apart from the inability of scientists to plan or control such tests within reason, there is sufficient legal justification to bring them under international legal control. The discoveries in modern science and technology have advanced the world to a stage where it would indeed be dangerous if the progressive development of international law lags too far behind. It is up to us lawyers and especially international lawyers to find a satisfactory solution to this urgent problem and to create international machinery to control nuclear testing.

Although it is the consensus of every one here that nuclear tests should be banned, and I sympathise and even subscribe to that, but to ban nuclear tests would still involve a political decision, and to do it with some measure of success it is necessary to have the assistance and cooperation of those who experiment with nuclear explosions. It follows as a matter of logic that the position would be the same in reverse if we, Asian African nations, are having nuclear tests either in the Atlantic Ocean or in Europe, East or West. But the facts remain what they are and we have to accept them as such. It would appear to be our special responsibility to see to it that international law corresponds to the needs of international life and in particular to the progress of international science and technology.

It is essential to observe that technically-I mean legally speaking-nuclear tests are not in themselves abominable. They need not be harmful if they could be done in such a way as not to cause damage to anything or to any human life. They need not be objectionable if they are conducted in a controllable manner, such as underground explosion, or if they do not involve another country either directly by being carried on upon the soil of another State, or indirectly

through fall-out, or if they are not conducted on the high seas or in the airspace over and above the high seas.

There is no existing positive rule of international law which prohibits the testing of nuclear explosions in one's own country without affecting private lives and properties. Rather it is part of territorial sovereignty to exercise such right or power. *Lex lata* therefore furnishes no legal basis to outlaw nuclear tests as such. But according to State practice as well as *de lege ferenda* several legal aspects of nuclear testing are open to discussion.

If nuclear testing is not in itself *injuria sine damno*, damage resulting from nuclear tests is clearly not *damnum sine injuria*. Needless for me to recall to my learned colleague from Japan that compensation was given as reparation for damages suffered by private persons as a result of a nuclear explosion. The legal basis for such a claim was undisputed.

The legal basis for the remedies for damages resulting from nuclear tests can be found not so much in the international law of State responsibility *co nomine*, or in the international law doctrine of *l'abus de droit*, but rather in a number of private law analogies irrespective of whether or not it involves State responsibility or an abuse of right in international law.

First, there is a general principle of law recognised by most nations dating back to classical Roman law that a person can enjoy the right in his property so long as he does so without harming his neighbour; similarly, a State could exercise its territorial sovereignty in so far as its exercise is not harmful to others.

Secondly, on the analogy of the common law concept of nuisance, tortious liability is created where an occupier of land lets some unpleasant or harmful substance, such as fumes or odour, escape from his land to the detriment of adjoining property.

Thirdly, absolute liability may be attributed to those who experiment with nuclear explosions on such legal principles as the doctrine of *Rylands* v. *Fletcher* or of strict liability for animals.

The following conclusions may be submitted:

a. The topic under consideration should be referred to as "Legal Control of Nuclear Tests".

b. Nuclear tests are not *per se* illegal, but to prevent potential harmful consequences they should be internationally controlled.

c. International machinery for legal control of nuclear testing should form the subject of further studies by this Committee. The Secretariat might be entrusted with the preparation of a further report on this point. A close and effective supervision of nuclear testing is needed.

d. Apart from the procedural machine to control nuclear testing, it should also be subject to the following substantive limitations:

(1) Nuclear tests should not be conducted on the high seas or in the air space over the high seas because they necessarily infringe upon the freedom of the high seas and airspace thereabove.

(2) Nuclear tests should not be performed in the territory not forming part of the metropolitan State conducting the tests.

(3) Nuclear tests should not be allowed if it is clear that there would be fall-outs dangerous or injurious to life.

e. Within the framework of the above substantive limitations which are preventive in nature, remedial measures should be provided whereby injured States or individuals should be fully and promptly compensated.

f. All things considered, a nuclear test, when legally and scientifically controlled, should only be conducted, if it does not involve the risk or potentiality of culminating in a global holocaust. For if and when such contingency actually does occur, humanity itself will be wholly destroyed and with it all the fine principles of international law it has evolved through centuries of toil and hardship must perish.

U.A.R.—There is no doubt that nuclear and thermonuclear explosions whether carried out on the ground, in the air or in the sea Produce blast, heat, fall-out and radiation which entail physical and biological effects very harmful to mankind and his environment.

To this may be added the internal hazard of these explosions to the human body, the hazard from radiostrontium. The risk of in-

troducing strontium 90 in the atmosphere could be a great hazard to the future of humanity. Scientists have already explained its biological damage, its relation to diseases (such as leukaemia, bone tumors and cancer) its effects on the reduction of life-span and also its genetic effects.

Apart from direct damages, nuclear and thermonuclear explosions have serious indirect damages, namely:

a. The possibility of mass movement of the population and of their deprivation of means of livelihood.

b. The effect on weather and rain.

c. The destruction of the living sources of the seas.

d. The interference with the freedom of air-navigation and the navigation in the high seas due to the large zones being rendered unsafe because of these nuclear explosions.

At the Tokyo session, I mentioned the harmful effects of the three French nuclear tests which were carried out in the Algerian Sahara on February the 13th 1960, April 1st 1960 and December 28th 1960. I said that, according to a report prepared by the Faculty of Science, Alexandria University, radiation increased in my country and the radioactive fall-out reached at times, as a result of these tests, fifty times double the normal.

It is appropriate to mention now the effects of the fourth French test which was carried out in the Algerian Sahara on April 28, 1961.

According to the data published by the U.A.R. Nuclear Energy Establishment, the fourth French test in the Algerian Sahara produced its effects in the territory of the U.A.R. Samples of airborne fall-out collected at Cairo and Inchas showed that the activity went up to a level which reached 300, 180, 100 and 80 times the background concentration of the air under normal conditions. The peak values of deposition of the mixed fission products at the selected sites varied from 4 to 99 per Km. square. The normal deposition was almost zero under normal conditions of no testing.

As regards the French nuclear tests, it was also announced that Ghana suffered from the first test which was conducted on February 13, 1960. It was proved that an increase of radiation was found in the samples of research workers. Harvest, soil, water and milk were badly affected.

As regards the nuclear tests conducted by the Soviet Union starting in September 1961, it was reported by the U.A.R. Nuclear Energy Establishment that the effects of these tests were felt in the territory of the U.A.R. and that the samples collected by this Establishment showed an increase of radiation and also the existence of radioactive fall-out.

Although nuclear tests may be conducted in deserted areas and under worked up precautions in order to avoid the exposure of the peoples to local fall-out, yet nothing can be done to avoid exposing almost the entire world population to global fall-out resulting from a large explosion. This global fall-out is inherent in the very nature of nuclear tests, particularly multi-megaton tests, and it cannot be eliminated. It is a long-term hazard. Its short-term effects are not the only risk.

As the adverse biological and genetic effects as well as the widespread damage resulting from nuclear explosions cannot be denied, I would not hesitate to declare nuclear tests illegal whether conducted by a State in its colonies, in trust territories, in the high seas or in its own territory.

Regarding nuclear tests carried out by a State in its colonies, we believe that Articles 73 & 74 of the United Nations Charter give specific rights to non-self-governing territories, and provide that these territories are no more under the complete sovereignty of colonial countries. The members of the United Nations having committed themselves to the respect of some international standards in their relations with their colonies, they no more have the right to expose the peoples of these territories as well as of the neighbourhood to disasters by undertaking nuclear tests.

Regarding nuclear tests carried out in trust territories, I would like to point out that under Chapter 12 of the Charter of the United Nations concerning the trusteeship system, as well as under the terms of trusteeship agreements, the trustee authority has no right to use the territories it holds on trust from the United Nations for the purpose of undertaking nuclear tests. Such an act by the trustee authority is against the basic objectives of the trusteeship system.

Regarding nuclear tests carried out in the high seas, we would like to point out that according to the law of the sea, no State can

exercise sovereignty over the high seas. In time of peace, freedom of navigation, freedom of fisheries, freedom to lay submarine cables and freedom of aerial movement are correlated to the absolute rule of freedom of the seas. Nuclear tests in the high seas cause injurious effects upon fishing even outside the zone of immediate danger. Moreover, States undertaking nuclear tests in the high seas, prohibit air navigation and sea navigation in the areas where the tests are carried out. This act is a grave interference with the freedom of the air and freedom of the high seas. There is no doubt that the destruction of the living sources of the sea is a violation of the existing rules of international law.

As regards nuclear tests carried out by a State in its territory, it was argued that the use of nuclear weapons in time of war may be justified on the ground that this will weaken the striking power of the enemy and a large number of human lives will be saved. This argument, however, is not available in case of nuclear explosions carried out in time of peace by a State even within its territory, since the harmful effects of such explosions cannot be confined within its boundaries and since aliens living in its territory or passing through the danger area and also the people of the neighbouring States may be affected by these explosions.

It was argued too that on the basis of national sovereignty, any country has the right to acquire nuclear weapons as a means of self-defence and that it has the right to carry out nuclear tests for the manufacture and perfection of these weapons. This concept, in our opinion, is unacceptable. We believe that nuclear weapons are against the existing rules of international law. There are many international instruments which include specific prohibitions of the use of poisonous weapons and gases and other weapons of mass destruction. The basic principle agreed upon in these international instruments is that the only legitimate objective of war is to defeat the enemy's military force and that the destruction of life and property which goes beyond this objective is illegal. Nuclear weapons, in our opinion, are illegal because they are poisonous and cause unnecessary suffering, and are employed without regarding the distinction between combatants and non-combatants. We may add that these nuclear weapons are against the principles of morality. The fear created by the explosion of such weapons is that of total destruction,

and no country is morally allowed to spread such fear and anxiety among the peoples of the world.

The responsibility of a State for damages caused to aliens living or passing through its territory and the peoples of the neighbouring countries as a result of nuclear tests carried out in its own territory may be based on the well known theory of the abuse of the right. According to this theory, the responsibility of the State may become involved when it avails itself of its right in an arbitrary manner in such a way as to inflict upon another State an injury which cannot be justified by a legitimate consideration of its own advantage. The responsibility of such State may be based also on the principle of absolute responsibility for dangerous substances or things which is universally recognised as a general principle of law by civilised nations.

I shall now answer briefly the questions formulated in the Topics for Discussion prepared by the Secretariat.

Number of Question	Answer
I. (A)	The State is responsible under the law of tort.
(B) & (C)	The State which conducts the test is liable to pay reparation to the injured alien's home State which may exercise its right of diplomatic protection of nationals abroad.
II. (A)	The use by a State of its own territory for the purpose of conducting nuclear tests is contrary to the principles of International Law.
(B)	The responsibility of the testing State may be based on the theory of the abuse of the right.
III. (A)	The liability of the testing State to pay reparation to the injured alien's home State may also be based on the principle of absolute responsibility for dangerous substances or things.
(B)	According to the general rules, the claimant must prove actual damage in order to be paid reparation. Probably damage is very difficult to be estimated.

In the mean time, the action should be suspended until the damage actually exists.

(C) Yes.

IV. Yes.

V. In all cases, however, whether damage is actual or not, the testing State may be compelled to desist from this dangerous act by an appropriate action. The competent body to decide on the necessity of such action is the United Nations.

VI & VII Yes.

VIII. No.

Observer for International Law Commission (Dr. Radhabinod Pal, Chairman of the Commission): I must first of all thank you for inviting me in my capacity as an Observer on behalf of the International Law Commission, as also in my personal capacity, to take part in the present deliberations of the Committee on the question of legality of nuclear tests. The question really is one that should immediately exercise the minds of all men of goodwill. Indeed, it raises a grave and anxious issue demanding immediate decision. I have listened with a deep and admiring attention to every word that has fallen from the Hon'ble Members of the Committee in respect of this question and I must say, that if the popular will of the world is at all a force, then the developments thus helping to bring together friends from the diverse parts of the world, would be sure to help them to find that preponderant coefficient of driving force which should win our souls and spirits in one flaming effort in this respect. The sense of injustice thus universally felt being an indissoluble blend of reason and empathy, though evolutionary in its manifestation, offering as it were, only a common language for communication, will, I am sure, have to be heeded to.

I express my inability to participate in this deliberation in my capacity as Observer on behalf of the International Law Commission for the simple reason that the question, though in a partial form, came before that Body as far back as 1956. The question came up before the Commission twice in the course of the same session, once in connection with the question of freedom of the high seas and

again in connection with the question of pollution of the high seas including the air space above. You will find a summary of the deliberations on those occasions in the Commission's *Year Book* for 1956, Vol. I at pages 11 to 62, though not of course continuous, under Articles 2 and 23 of the draft on the Law of the Sea; you know this draft was ultimately substantially adopted by the United Nations in the shape of the Geneva Convention of 1958. I can't vouch whether attention of the Representatives are drawn to the discussions that took place on these questions before the Commission. But anyway those Articles, which are the result of the discussions, are adopted by the United Nations. As to my personal capacity, I should only say I had not the questions before me, before I came here, and I had not an opportunity of thoroughly examining any of them. Without such a study I should not venture any comment or opinion on these grave questions.

As to the question of legality of use of nuclear weapons in war, again, I have had occasion in quite a different capacity to express my view in relation to such user by the Allied Powers at Hiroshima and Nagasaki, and I should refrain from saying anything more in this connection. I did give expression to my views in my dissenting judgment. In these circumstances, and specially in view of the most comprehensive nature of the questions raised, I would pray that yourself and the Distinguished Members of the Committee would excuse my inability to comply with your invitation to participate in this deliberation in either capacity. The question involved really goes to the very root and raises many fundamental matters, which, I must confess, I could not pay proper attention to before coming here. The developments in question have driven us so helplessly to live with the horror of our achievements that I venture not to trust my ability to keep my capacities distinct in this respect and I will therefore refrain from saying anything more here in this connection. At the same time, I would assure you, I shall draw the Commission's special attention to this matter, to the questions raised and deliberations as also the conclusions arrived at this meeting.

In concluding, I would like to draw the attention of this Body to the typical justifying attempts which appear in the Editorial Note by Professor Myres McDougal of the Editorial Board of the

American Journal of International Law in 1955, in the said journal at pages 356 onwards, which note was provoked by the condemnation of such tests by Arnold Jowett in the British House of Lords in 1954 (*House of Lords Debate, Fifth Series*) as also by a very comprehensive attack on the tests by Dr. Margolis in the *Yale Law Journal* (1955). I would utter one word of caution, though not of grave consequence, namely our reference to the advisibility of referring to and relying on Article 38 of the Statute of the International Court.

Article 38, as you all know, comprises several clauses. So far as clause (d) is concerned, the decisions collected by the Secretariat should at least provide a subsidiary means for the determination of the law on this point, and there is a general principle of law well recognised by the civilised nations referred to in clause (c). But then what I am warning you or saying a word of caution in reference to is this: If you will refer to the debate at the Sixth Committee of the General Assembly during its 1960 session, while adopting a resolution on future work in the field of codification and progressive development of international law whereby we decided that international law must take due account of the momentous political, economic and social development which had been taking place in international communities, you will find what possible use the existence of this Article in this Statute is capable of. I can tell you that some say that in spite of the changing world, in spite of the changing geography of international law, in spite of the new nations coming into being who had no voice in the formation of the existing international law, the nations have indirectly accepted the existing rules of law, the international law, the rules, actual rules framed, though they did not participate in it, through this Article 38, because Article 38 is on the Statute and by being Members of the United Nations, they also became automatically members of the Court, and thereby accepted everything that is stated in the Statute, and that is why I am just uttering a word of caution before you refer to and rely on this Article 38 of the Statute of the Court.

Observer for the United Nations (Mr. Oscar Schachter) Mr. Chairman, I am very grateful for the opportunity you have given me to say a few words on this important subject, but all I can do with all humility is perhaps say a few words rather tentatively in my personal capacity.

In regard to the issue posed before this Committee, I would like to raise some questions which occurred to me. My essential question is whether this problem of such magnitude and complexity can properly and justifiably be discussed in terms of analogies and legal concepts drawn from other situations. As one who has been a teacher of law and a student of law as well as an official, I share with many of you the interest and even the delight of dealing with analogy, of extending to new situations old principles and of attempting to find in various legal systems, common maxims and common principles. These are fascinating exercises for the lawyer. They are creative and they are a great utility to the judicial bodies in dealing with new situations. But there is always the question that lawyers must face, as to whether it is justified and wise to apply particular maxims to situations which in many respects are substantially different. Can we carry principles of tort and tortious responsibility, the doctrine of *Rylands and Fletcher* which has to do with pollution of streams, the *Trail Smelter case*, over to an area which involves such entirely different considerations, which involves problems of the magnitude that are completely disproportionate to the problems dealt with in these cases? I wonder too whether it would carry conviction, in the outside world, if lawyers, jurists, said that this problem of nuclear tests which has been perplexing the world and the United Nations for many years can in some way be answered by referring to *Rylands and Fletcher* and the *Trail Smelter case*. I am raising this as a question, and as a question I think it should be considered. Does not one beg the question of the nuclear test simply by referring to these analogies? After all the records of the United Nations and elsewhere show that the States concerned do recognise the harm. They do consider this an evil. There isn't any question about the desirability of bringing about a cessation of nuclear tests, but there is the problem, a great problem of the predicament in which these States, these major powers, have found themselves. They are not desirous of continuing nuclear tests, and to some degree they have been attempting to deal with this, to meet their preoccupation with the problems of security, by negotiations long protracted, but not, in my opinion, fruitless, in order to arrive at the kind of arrangement, the kind of solution, which will bring this problem to the end. As those of you who are acquainted with the progress of the talks in Geneva must be aware, that a treaty has been virtually agreed upon though there still have been some clauses which have not been agreed

upon. I don't put this forward in an optimistic sense but as an indication that the parties concerned do consider that feasible and that practical arrangements are possible to solve this problem. Now what I am in essence suggesting here by way of questions is, that this is the problem of legislation and that this is the problem of new arrangements that must be made. I think the jurists of the world can make a contribution in that direction not only by looking at the past, not only with trying to find out where the precedents regarding noxious fumes or pollution of streams may be relevant, but by more realistically looking at what might be done towards arrangements which can be effective and which can promise at this particular juncture some hope of early attainment. And therefore I would simply again stress that I am speaking now as one who views this in the professional sense in terms of the problem of law that has been raised and to indicate that the real question is whether this is not a legislative problem to be faced through new arrangements now being worked out rather than a problem to be viewed in terms of analogies, concepts and precedents derived from wholly different situations. I put forward these questions with great humility and with all respect to the very interesting and learned discussion which I have greatly benefitted from you. Thank you very much Mr. Chairman.

Observer for the League of Arab States (Dr. Clovis Maksoud): We in the Arab States, may be logically, or because we do not possess the various nuclear and thermonuclear weapons, approach this problem without the caution that commitment requires, because through the Arab League the Arab States and Governments have declared without equivocation that they are against nuclear weapons, and the testing of nuclear weapons. We would do all within our possibilities to commit, not only our respective governments, but also persuade governments of like minded interests and like minded attitudes to do the same thing. Therefore I find myself not necessarily representing an organisation where the views have not been concretised as in the United Nations in so far as the finality of conclusions have not been attained in view of the fact that discussions are still in progress; the organisation which I represent includes the 12 governments who have committed themselves against nuclear tests. Therefore if I might sound a little less cautious or less tentative in the expression of my views, I know that usually, in such distinguished jurists' associations and committees, tentativeness and caution are criteria for eligibility to speak. However, I beg to show that it is also a very juristic position to take a definite stand, to do this without any caution and without tentativeness, at least as far as the Arab States are concerned. On the other hand, I would like to make a few basic observations concerning this very important problem to which we have been subjected. On the one hand, we have observed from the various discussions that have been made in the last day or two, that the political and legal questions involved in the nuclear tests pass imperceptibly into each other. Therefore it is not possible to distinguish completely the political from the legal problems involved. In a way the problems that are here before us concerning the ban on nuclear tests are in fact a blend of political, military, strategic as well as legal questions and this becomes more self-evident in the sense that the legal consequences, namely, the effects on human beings of the nuclear tests, are not always evident and clear, and this is due to the fact that the biological results and the scientific conclusions that have been attained in the last few years have rendered it almost without any doubt that the physical effects on the biological states of man are long-range and that it is not necessary for the effects of nuclear tests to affect the human being within a limited period of time. However, there are also the mutations which develop and which cannot be foreseen either in terms of the being itself or in terms of the time when this mutation will evolve. Therefore the legal consequence of this biological result is not determinable and because of the fact that it is not determinable, it makes the legal position rather untenable; it makes the legal consequences and possible legal reflection difficult to maintain unless the question of fact is proven as in the case of torts. If it is not proven within the framework of time, it is not possible therefore to have a legal consequence out of this nuclear position. Hence the problem of mutation in the physical development of man, in the biological development of the future generation, is not determinable. Hence if we apply the classical and traditional legal precepts and concepts, the issue of mutation and its long-range effects on the physical structure of man is in a state of flux and fluid. Therefore this problem itself is of vital importance. The documents have proven the point that the mutation is on the future generation most probably and that this mutation can express itself in biological defects in many consequences which are not

determinable either in terms of medicines or in terms of observations. Hence it is a matter for the jurisprudence of modern times to determine, despite the fact that there is an absence of precedent in this matter,and to apply the traditional concepts of law and jurisprudence, in view of the fact that there is such a determination of the physical effects which are the results of biological mutation which have been proven scientifically to be inevitable as a result and the consequence of nuclear tests. Therefore, I submit for your consideration that we take a dynamic view of the legal consequences of this mutation on the biological effects of nuclear tests, particularly when we discover that these effects are no more determinable, not only in terms of nuclear tests, but also because we find to-day that the testing of basic strategic weapons is so comprehensive, so diversifying that we cannot any longer pinpoint one type of nuclear weapon only which has become known to us as it is no more scientifically proven that all nuclear weapons which have to be tested are indentical. We observe today, in the development of strategic weapons, a large measure of diversification, a large measure of testing of new weapons and new scientific discoveries, and therefore in the same manner as mutations are unforseeable but inevitable, by the same token we find the efforts on the part of various nations, particularly the big nations of the world, to contribute to the scientific discovery, by breaking-through into new kinds of thermonuclear weapons and it is this break-through which we cannot foresee nor even the scientists can foresee the consequences of this break-through into new horizons of scientific and technological discovery. That it has become very self-evident for us, particularly in Asia and Africa, to realise that the break-through which is unforeseen in terms of technological advance, in terms of nuclear weapons, a certain degree of test ban should be immediately imposed and all our political as well as diplomatic efforts should be mobilised in this direction. But what is even more important is the fact that each of the nuclear powers in the world considers it a preemptive advantage on its part to regard this as a suspicion of preparation for war and this is where the testing of nuclear weapons and new weapons becomes a very dangerous factor. The suspicion of preparation for war is no longer a suspicion, but a cause of war itself, and therfore both sides consider the vulnerability of either of their sides in terms of retaliatory forces to an attack by either side. Therefore it is important for us to realise, as the distinguished Representative of the United

Nations has just said, that we in terms of jurisprudence should acquire a more dynamic concept and realise that nuclear weapons and the new break-through into thermological advances in terms of destructive weapons have introduced a new dimension which should have its impact and should stimulate a new dimension in jurisprudence itself. Perhaps the Afro-Asian jurists, in particular, are in a position to extricate themselves into that position of neutrality, if we might say, or impartiality, and to provide the break-through not in terms of technological destructive weapons, but the break-through in terms of providing international law and jurisprudence a new dimension, which would take into consideration not only the hopes and aspirations and moral considerations that are pertinent and relevant to our very survival, but will take into consideration the necessity of reflecting new political and physical and biological considerations in terms of references which would be applicable to our new jurisprudence and legal precedent.

As the President, formulating the issues involved in this discussion, made it very clear in his last formulation, namely, "Can we not apply the accepted principles of civilised jurisprudence?" I am sure that the President, as well as many of us, consider the terms "civilised" as operative because the term "civilised" is a dynamic concept. Civilizations, of course, take into consideration the great heritage of mankind, the great contributions of the past, the great precedents in terms of jurisprudence that have been established and proven relevant and valid. But the term "civilized" must be accommodating for the new forces and the new factors that have been introduced as a static concept of civilization can be ultimately a negation of civilization. Therefore we are confident that, particularly in this Committee, it is necessary not only to accept the straight jacket of precedents, however important precedents are, but to bring about a formulation which would take into consideration the new factors, and that these new factors would constitute a new dimension in terms of modern and contemporary jurisprudence.

Therefore, I submit to you that it may be *a priori* on our part to state that nuclear tests are illegal in all phases. Of course, we must have a certain commitment to the tenets of jurisprudence and we must prove this and we can only prove it by the application of the rules of law, and these rules of law must take into considera-

tion the new factors that have been introduced. We in the Arab States and all the Arab Governments look forward to the proceedings in this field because we consider that your conclusions in this line not only will help provide new factors and new interpretations in jurisprudence, but will also help the efforts of mankind not only towards its survival but towards its purposes in existence and being.

Observer from Ghana:- Ghana's position on the question of nuclear tests has been quite clear. My President has made it clear in no uncertain terms that Ghana is completely opposed to nuclear tests in the Continent of Africa or in any other part of the world. The Distinguished Delegate from U.A.R. was right in stating that my country became a victim to the effect of French nuclear tests in the Sahara not so long ago. That these tests must of necessity be ceased cannot be overemphasised and I wish to take this opportunity of reiterating our *status quo ante* to the effect that this Committee, this year, take perhaps a more definite step in initiating some sort of international legislation to stop these nuclear tests. In conclusion, I wish to associate myself with the answers given by the majority of Delegates to the questionnaire before the Committee.

V. A STUDY ON THE LEGALITY OF NUCLEAR TESTS

(Prepared by the Secretariat of the Committee)

TABLE OF CONTENTS

INTRODUCTION

Object & plan of study

The object of this Study is to examine the question of legality of nuclear tests in time of peace. It is estimated that over three hundred atmospheric or surface tests have been carried out in various parts of the world. About one hundred and seventy atmospheric tests have been carried out by the United States, and the Soviet Union has carried out about one hundred and twenty atmospheric tests. The United Kingdom and France have also carried out some tests. The majority of these tests have been carried out in or near the Asian-African region and Asian-African States are therefore the countries most directly concerned with the question. The United States has used the Marshall Islands, Johnston Island and Christmas Island in the Pacific Ocean as the main sites for the testing of nuclear weapons, and some of these tests have had harmful effects on the people and territory of Japan. The Soviet Union has tested its nuclear weapons in Central Asia and Siberia, and the United Kingdom has carried out its nuclear tests in the Monte Bello Islands and in Australia. France has tested its nuclear weapons in the African Sahara and some of these tests have had harmful effects on neighbouring African States. The testing of nuclear weapons is therefore a matter of common concern among Asian African countries and the Asian-African Legal Consultative Committee has decided to give this subject top priority.

It will be observed that the subject under consideration is the legality of nuclear tests in time of peace and the Report of the Secretariat therefore confines itself to this question and does not deal with the question of the legality of the use of nuclear weapons in time of war. In order to examine the question of legality of nuclear tests, it is first necessary to study the effects of nuclear tests as the various legal questions on this subject would only arise if the effects are found to be harmful to the health and well-being of the peoples of the world. The scientific information on the effects of nuclear tests contained in Chapter I of this Report is essentially a summary of the information contained in the Reports of the United Nations Scientific Committee on the 'Effects of Atomic Radiation', the Reports of the British Medical Research

Council on the 'Hazards to Man of Nuclear and Allied Radiations' and Reports of Japanese Scientists on the 'Effects and Influences of the Nuclear Bomb Test Explosions'. Chapter II of the Study deals with the application of the principles of State responsibility and tortious liability to the problem of nuclear tests in order to determine whether the carrying out of nuclear tests amounts to the commission of an international tort and whether there is State responsibility for the damage caused by such tests. Chapter III of the Study consist of an examination of the question of the compatibility of nuclear tests on the high seas in time of peace with the principle of the freedom of the seas, in order to ascertain whether such tests interfere with freedom of navigation and freedom of fishing on the high seas and thus violate fundamental rule of customary international law. The Study concludes with an examination of the partial nuclear test ban treaty entered into by the United States, Britain and the Soviet Union.

CHAPTER I

The Effects of Nuclear Weapons

In order to examine the question of legality of nuclear tests, it is first necessary to study the effects of nuclear explosions and the damage that the nuclear tests have already caused. It is, therefore, necessary to commence with an examination of the relevant scientific data regarding the effects of nuclear explosions. While the technology of nuclear weapons is exceedingly complicated, the basic scientific facts regarding the effects of the explosions are now clear and can be stated for the present purpose in a very brief compass. These basic scientific facts have implications which bear directly on the problems confronting world statesmen today and have given rise to questions with which international law must concern itself.

Over three hundred nuclear tests carried out

It is estimated that over three hundred atmospheric or surface tests have been carried out in various parts of the world. The first nuclear test was carried out by the United States in Alamogordo, U.S.A., in July 1945 when a fission bomb was exploded for experimental purposes. In August 1945, two fission bombs were dropped by the United States on Hiroshima and Nagasaki in Japan. In June and July 1946, the United States carried out two nuclear tests in Bikini Atoll. In March and April 1948, three fission bombs were exploded by the United States in Eniwetok. In 1949, the Soviet Union is reported to have carried out its first nuclear tests, within its own territory. In January and February 1951, the United States exploded several fission bombs in its own territory in Nevada. In the spring of 1951, the United States exploded four fission bombs in Eniwetok. In September and October 1951, the Soviet Union exploded two fission bombs within its own territory. In October and November 1951, several nuclear tests were carried out by the United States in Nevada. From February to April 1952, the United States exploded eight fission bombs in Nevada. In October 1952, the United Kingdom carried out its first nuclear tests in the Monte Bello Islands. In November 1952, the United States exploded several fission bombs in Eniwetok. In March 1953, the United States exploded eleven

fission bombs in Nevada. In August 1953, the Soviet Union exploded several fission bombs within its own territory. In October 1953, the United Kingdom carried out several tests of fission bombs in Woomera, in South Australia. In March and April 1954, the United States exploded several hydrogen bombs in Bikini and Eniwetok in the Pacific Ocean. In September and October 1954, the Soviet Union exploded a number of hydrogen bombs in its own territory. From February to May 1955, the United States carried out several nuclear tests in Nevada. In August and November 1955, the Soviet Union exploded several fission and hydrogen bombs within the U.S.S.R. In April 1956, the United Kingdom carried out a test of fission bomb in the Monte Bello Islands. From October to November 1956, the United Kingdom tested several fission bombs in Maralinga, South Australia. In 1956, 1957 and 1958 the United States and the Soviet Union continued testing nuclear weapons within their own territories until the nuclear test ban conference commenced in Geneva in November 1958.

France carried out her first nuclear test on 13th February 1960 in the Sahara. Nuclear tests were carried out by France again on 1st April 1960, 27th December 1960 and 25th April 1961 in the Sahara. During the years 1959 and 1960, no nuclear tests were carried out by either the Soviet Union or the United States. On 30th August 1961, the Government of the Soviet Union announced that it was going to resume the testing of nuclear weapons and this announcement was immediately followed by a series of nuclear tests which was carried out in Central Asia and the Soviet Arctic. The first Soviet test in the new series was carried out on 31st August 1961, and on 23rd October 1961 the Soviet Union exploded a 50-megaton bomb in the Arctic island of Novoya Zemlya. The Soviet Union continued to carry out further atmospheric tests in various parts of its territory for several months. According to an announcement of the United States Atomic Energy Commission made on 25th September 1963, it has been estimated that the Soviet Union has carried out about 121 atmospheric or surface tests since the first nuclear weapon was tested in Soviet territory in 1949. No information is available regarding Soviet underground tests. On 2nd March 1962, the President of the United States announced that the United States would resume

nuclear tests in the Pacific Ocean regions, and the first nuclear test was carried out on 25th April 1962 in the vicinity of Christmas Island. This was followed by a series of nuclear tests which were carried out in the vicinity of Johnston and Christmas Islands for several months. In a statement issued on 25th September 1963, the United States Atomic Energy Commission announced that since the United States first began testing nuclear weapons, she has carried out altogether about 170 atmospheric or surface tests, 10 tests at altitudes over 100,000 feet, some of them actually in outer space, and 6 underwater tests. Apart from these it is estimated that the United States has carried out about 105 explosions underground.

The test explosions which have taken place in America, in Russia, in North Africa and in the Pacific Ocean are equivalent, in the aggregate, to more than 5,000 bombs of the type that fell on Hiroshima. Each atmospheric test has added its quota of radioactive material to the land, the sea and the air. The general contamination of the world with radioactive substances will multiply as the years go by if more bombs are exploded and the harm this will do and is capable of doing is already evident from the materials already published. Scientific data is now available regarding the effects of the atmoic bombs dropped by the United States over Hiroshima and Nagasaki and regarding the effects of the nuclear tests carried out by the United States in the Pacific Ocean. Some information is also available with regard to the effects of the nuclear tests carried out by France in North Africa. There is, however, very little accurate information available with regard to the effects of the nuclear tests carried out by the Soviet Union as these tests were often carried out in complete secrecy. There is however no reason to believe in the absence of evidence to the contrary that the effect of nuclear tests carried out by the Soviet Union would be any different from the test explosions carried out by other powers. The scientific data available on the effects of nuclear explosions carried out by the United States gives us an indication of the harm caused by such explosions and at any rate of the harm the tests are capable of causing. It would, therefore, be reasonable to proceed on the basis of such scientific evidence in examining the question of legality of nuclear tests from the point of view of international law.

The effects of the atomic bombs dropped on Hiroshima and Nagasaki

So much has been written of the effects of the two atomic bombs dropped on Hiroshima and Nagasaki in August 1945, that it is only necessary here to survey briefly the main facts. The first atomic bomb to be used in time of war was exploded at 8.15 a.m. on the morning of 6th August 1945 over Hiroshima. The effect was catastrophic. The communique issued by the General Commanding the U.S. Strategic Air Forces in the Pacific stated that the reconnaissance photographs showed that "the heart of the city had been wiped out with such awful thoroughness that it was as though some giant bulldozer had swept across the buildings and houses. The photographs showed that four and one-tenth square miles of the city's built up area of six and nineteenth square miles were completely destroyed by the atom bombing mission." When Western correspondents entered Hiroshima at the beginning of September, they found the city obliterated and desolated. On 5th September 1945, the London *Daily Telegraph* correspondent described the scene thus:

> "Only the vultures live now in Hiroshima, first city in the world to be atom-bombed. Today I drove in to this town, the most destroyed town in the whole of the war. Today, nearly a month after the first atom bomb fell, the stench of death was terrible—worse than the stench of the battlefields in Normandy. It was as if all the bombed towns in the world had had their devastated areas lifted out and all had been placed together here..... I stood in what was the exact centre of Hiroshima and looked around slowly in a circle. There was absolutely nothing for two miles in any direction."

On 5th September 1945, the London *Daily Express* correspondent also described the horror and devastation in the following words.

> "Hiroshima does not look like a bombed city. It looks as if a monster steamroller has passed over it and smashed it out of existence. In this first testing ground of the atomic bomb, I have seen the most terrible and frightening desolation in four years of war. It makes a blitzed Pacific island seem like an Eden. The damage is far greater than photographs can show. When you arrive in Hiroshima you look around and for 25 and 30 square miles yousn ac eehardly a building. It gives you an empty feeling in the stomach to see such man-made devastation.... In Hiroshima, 30 days after the first atomic bomb destroyed the city and shook the world, people are still dying, mysteriously and horribly—people who were uninjured in the cataclysm—from an unknwon something which I can only describe as the atomic plague. Many people had suffered only a slight cut from a falling splinter of brick or steel. They should have recovered quickly. But they did not. They developed an acute sickness. Their gums began to bleed. And then they vomitted blood. And finally they died."

A second atomic bomb was dropped on 9th August 1945 on Nagasaki. The results were again cataclysmic, one third of the city being destroyed. The plutonium bomb used at Nagasaki had a 15 per cent greater radius of destruction than the Uranium 235 bomb used at Hiroshima. At Hiroshima approximately 80,000 people, one quarter of the population, were killed, and at Nagasaki approximately, 40,000 people or one-sixth of the population were killed. The lower casualties at the latter city were due to the uneven terrain which shielded parts of the city from the effects of the bomb. At Hiroshima 4.7 square miles of the city were destroyed and at Nagasaki 1.8 square miles of the city were destroyed. The mortality rate per square mile destroyed in Hiroshima was 15,000 people, and 20,000 people per square mile destroyed in Nagasaki. Both at Hiroshima and Nagasaki the scale of the disaster brought city life and industry virtually to a standstill.[1].

The technical effects of the explosion when the atomic bomb was dropped on Hiroshima are described in the following passage of the Summary Report of the United States Stragetic Bombing Survey on the Pacific War:

> "At the time of the explosion, energy was given off in the forms of light, heat, radiation, and pressure. The complete band of radiations, from X and gamma rays, through ultra-violet and light rays to the radiant heat of infra-red rays, travelled with the speed of light.

1. *The Effects of the Atomic Bomb at Hiroshima and Nagasaki* — Report of the British Mission to Japan, 1946.

The shock wave, created by the enormous pressure, built up almost instantaneously at the point of the explosion but moved out more slowly, that is at the speed of sound. The superheated gases constituting the original fire-ball expanded outwards and upward at a slower rate.... The duration of the flash was only a fraction of a second but it was sufficiently intense to cause third degree burns to exposed skin upto a distance of one mile.... In the immediate area of ground zero (the point on the ground below the explosion), the heat charred corpses beyond recognition."

It is estimated that the temperature at the core of an atom bomb at the moment of the explosion is about one million degrees and the shock waves produced by escape of the compressed gases cause severe damage and destroy everything they encounter.[2] The explosive energy released by a nuclear weapon equivalent nominally to 20 million tons of T.N.T. is 8.4×10^{22} ergs. In comparison, the total energy release in recorded earth-quakes varies from 10^{22} ergs for a slight local tremor to 10^{26} ergs for a catastrophic earth movement. A blast wave is propagated through the air from the centre of the explosion of such a bomb. The radius of complete destruction would be at least five miles, that of severe damage at least eight miles and of partial damage at least eighteen miles. These figures will vary with the size of the bomb, being proportional to the cube root of the explosive power. It is estimated that the 20-megaton bomb, now possessed by the United States, would have 1,000 times the nominal explosive power of the bomb that devastated Hiroshima. The propagation of the blast wave through the atmosphere enables the occurrence of an explosion of a nuclear weapon to be detected from a distance of many hundred miles if the bomb explodes in the air. If the bomb is exploded underground in a cavern, a great deal of energy will be propagated as an earthquake shock wave through the ground, so that with an energy release of the order quoted above such an explosion underground is hardly likely to escape detection.

2. For scientific of the surveys effects of the atomic bombs refer *"The Effects of the Atomic Bombs at Hiroshima and Nagasaki."* Report of the British Mission to Japan, 1946; *The Effects of the Atomic Weapons*, United States Atomic Energy Commission, 1950.

The extreme temperature attained gives rise to an enormous radiation of heat and energy at the instant of the explosion. The instant heat flash persists for about twenty seconds, and fires and burns of exposed skin might be expected at a distance of twenty miles. The distance at which such effects are to be expected is proportional to the square root of the size of the bomb. An intense radiation of gamma radiation occurs for a minute during the explosion. However, the radiation is rapidly absorbed by the intervening air and at a radius of two miles would be reduced to 400 roentgens. Beyond a radius of four miles no immediate harmful effects are to be expected. Intense neutron radiations given off the same time will be less hazardous.

Local and global radioactive fall-out from nuclear test explosions

With regard to explosions in the megaton range, the most far-reaching hazard comes from the fall-out of radioactive fission products produced in the explosion. Indeed, in the case of test explosions carried out by the various powers, in view of the precautions that are taken to prevent casualties in the neighbourhood of the explosion, the fall-out constitutes perhaps the main hazard that requires serious consideration. The fall-out also provides a very sensitive method of detecting the occurrence of nuclear weapon test explosions from a great distance. It is reported that fall-out from the Soviet tests carried out in the atmosphere was detected over Japan and India[4].

If a nuclear weapon is exploded at low altitudes, the central mass of hot gases, the fire-ball, which may have a diameter of three miles or so, may reach to the ground. The intense heat produces a huge crater and as much as 10-100 millions tons of earth and rock may be vaporized and drawn up through the intensely radioactive cloud. The dust, when it condenses out from the vapour, will itself be intensely radioactive. The dust will be drawn up to a height of perhaps 30,000 or 40,000 feet. Then it will begin gradually to fall towards the ground again. As it falls

3. For accounts of the effects of nuclear weapons, refer *Nuclear Explosions and Their Effects*, Government of India Publication, 1956.
4. On fall-out from nuclear tests, refer, *Contamination of the World by Fall-Out from Nuclear Test Explosion*, 1957, St. Paul's University, Tokyo, Japan.

slowly, it will be drawn by the prevailing winds far from the point of the explosion. The larger dust particles may be drawn along by the wind for hundreds of miles before they fall out. A particle of dust of about 1/10 milli-metre in diameter will fall from 40,000 feet in about four hours, while a particle 1./100 milli-metre in diameter will take about two weeks to fall the same distance. The relative size of the particles of the fall-out will depend on the type of the surface that comes into contact with the fire-ball.

When a nuclear bomb is exploded under fixed conditions, the danger area due to local fall-out radiation would be expected to be approximately proportional to the amount of fissionable material contained in the bomb. The local fall-out consists mainly of short-lived fission products—Molybdenum 99, Tellurium 32, Iodine 131, Barium 140, Praesodymium 143 and Cerium 143.

If the bomb is exploded so high that the fire-ball does not strike the ground, the radioactive fission products will not condense on dust particles to anything like the same extent. They will be drawn to much higher altitudes, perhaps to 100,000 feet, and will gradually spread out over a large part of the world. They will settle down slowly, sometimes become attached to water drops and reaching the ground with rain and snow. Even when the fire-ball does touch the ground, a certain proportion of the fission products will go to great altitudes and contribute to the global fall-out.

The global fall-out may persist for about ten years after the explosion of a nuclear weapon, about 10 per cent falling out each year. This means that the global fall-out will consist almost exclusively of the long-lived fission products such as Strontium 90 and Caesium 137. In this respect if differs markedly from the local fall-out in which the greater part of the activity is contributed by short-and-medium-life fission product.[5]

It has been estimated that each of the thermo-nuclear weapons tested by the United States has yielded an amount of radioactive materials many hundreds of times greater than that from the ordinary atom bomb exploded in Hiroshima. A careful examination of the fall-out produced in one of these explosions has esta-

5. Refer *The Long Range Fall-out from Nuclear Tests Explosions*, Medical Research Council, London.

blished that the main explosive force must have come from the fission of uranium 238. It is now believed that the large bombs so far tested have been the "three-decks" bombs consisting of a thermonuclear bomb surrounded by a shell of ordinary uranium. It has been suggested that it may eventually be possible to produce a hydrogen bomb completely free of fission products and thence a truly "clean" bomb. There is no evidence, however, that such a means of detonation has as yet been achieved. President Eisenhower of the United States stated in June 1957 that he had been assured by three of his scientific advisers that it might be possible to produce an absolutely "clean" bomb, after four or five more years of nuclear tests. On the other hand, other American scientists do not consider that it is possible to make clean bombs which release no radioactivity. Confirmation of this point of view is given by the report in the Journal *Science* (1957) that during explosion of even the 'cleanest' bomb part of the non-radioactive material of the bomb will pick up neutrons and be converted into manganese 54 carrying millions of curies of radioactivity. In any case, it appears that the search for a clean bomb will involve even the United States in four or five more years of tests during which bombs producing radioactivity will be tested. The testing of nuclear weapons has already significantly and irrevocably increased the background radioactivity in the world, in the same way as would an all out nuclear war, though to a lesser extent. Each test of nuclear weapon has so far added its quota of radio-active material to the land, the sea and the air. The tests carried out in the underground may minimise the risk of fall-out but what their other effects will be have yet to be seen.

In the foregoing pages it has been clearly shown that radio-active material carried into the atmosphere settles back on the earth as fall-out and that this is the most serious hazard to be faced after a nuclear explosion. It is now proposed to give a brief out-line of the ways in which such atomic radiations affect living crea-tures and to indicate what is now known about the hazards which may arise from the explosion of nuclear weapons. The chief sources of information which will be used are the Reports of the United Nations Scientific Committee on the Effects of Atomic Radiation and the Reports of the British Medical Research Council on the Hazards to Man of Nuclear and Allied Radiations.

The effects of atomic radiation

Atomic radiations, more correctly called ionizing radiations, arise when radioactive atoms distintegrate and turn into new atoms, at the same time emitting one or more of the particles of which they are composed. These particles can have positive or negative electric charges, or be uncharged, and travel very fast or less fast, according to what kind of atom is disintegrating. In some cases, as in the Hiroshima explosion, energy is emitted also, not in the form of particles, but in the form of gamma rays which are very penetrating form of X-ray. All these forms of atomic radiation are similar to cosmic rays. In this survey all the forms of atomic radiation will be considered together because they all have similar biological effects, and an attempt will be made to give a sober, factual and reasonably simple account of the effects of atomic radiation on living creatures, especially on man. The survey will not be confined to radiation from fall-out, but it would be discussed in relation to natural background radiation and medical radiation, and an attempt will be made to assess the hazards of atomic radiation in the light of the information available up to July 1961 in the reports of the U.N. Scientific Committee and the British Medical Research Council.

The biological effects of atomic radiation

When atomic radiations pass through living matter, which is composed largely of water, they split the water and other constituents into chemically very active and unstable electrically charged parts or ions, hence the name 'ionizing radiation'. These ions are created along the track of the radiation, and they can react in turn with other important molecules in cells, causing chemical changes which alter or render completely inactive some of the cells. The biological importance of these effects depends upon how far the susceptible molecules are vital for the life of the cell, and whether they are in short supply or can be replaced. The effects have mostly been studied using large amounts or radiation, from 50 to 1,000 or more rads. Evidence is derived mainly from experiments on living cells in tissue culture, on plants, on insects, and on experimental animals such as mice; but direct information on the effects of radition on man is derived from the scientific observation of the victims of the atomic bombs dropped on Hiroshima and Nagasaki and also from studies of accidental exposures of

persons in industry or in atomic energy plants. Large doses of radiation (100,000 roentgens or more) kill any mammalian tissue in a few minutes, and doses of 3,000—10,000 roentgens do so in a few hours. At doses from a few hundred to 3,000 roentgens the main immediate effect is to stop cell division. Since cell division is the means whereby body cells are constantly being replaced as they wear out, a person or animal whose cells cannot divide will die. A dose of radiation received by the whole body has a much greater effect than the same dose applied to a part of the body; this is because undamaged cells from elsewhere can often replace the damaged ones. Thus a dose of 500 roentgens, which would have a negligible effect on the rest of the body if given, say, to one arm only of a man, would kill about half of those people who were exposed to it over their whole bodies after an atomic explosion. The pattern of events which follows exposure of the whole body or most of it to a large dose of atomic radiation is called "acute radiation sicknesses." It is vividly described in the following extract from the British Medical Research Council Report on the *Hazards to Man of Nuclear and Allied Radiations* (1956):

> "The first effect of exposure of the whole body to a heavy dose of gamma rays of the order of 500 roentgens is a sensation of nausea developing suddenly and soon followed by vomitting and sometimes by diarrhoea. In some people, these symptoms develop within half an hour of exposure; in others they may not appear for several hours. Usually, they disappear after two or three days. In a small proportion of cases, however, the symptoms persist; vomitting and diarrhoea increase in intensity; exhaustion, fever, and perhaps delirium follow; and death may occur a week or so after exposure.
>
> Those who recover from the phase of sickness and diarrhoea may feel fairly well, although examination of the blood will reveal a fall in the number of white cells. Between the second and fourth weeks, however, a new series of ailments, preceded by gradually increasing malaise, will appear in some of those exposed. The first sign of these developments is likely to be partial or complete loss of hair. Then from about the third week onwards, small haemorrhages will be noticed in the skin and in the mucous membranes of the mouth, which will be associated with a tendency to bruise easily and

to bleed from the gums. At the same time, ulcerations will develop in the mouth and throat, and similar ulceration occurring in the bowels will cause a renewal of the diarrhoea. Soon, the patient will be gravely ill, with complete loss of appetite, loss of weight, and sustained high fever. Feeding by mouth will become impossible and the healing wounds will break down and become infected.

At this stage, the number of red cells in the blood is below normal, and this anaemia will increase progressively until the fourth or fifth week after exposure. The fall in the number of white blood cells, noted during the first two days after exposure, will have progressed during the intervening symptomless period, and will by now be reaching its full extent.

The changes in the blood-count seriously impair the ability to combat infection, and evidence from Nagasaki and Hiroshima shows that infections of all kinds were rife among the victims of the bomb. Many of those affected die at this stage and, in those who survive, recovery may be slow and convalescence prolonged; even when recovery appears to be established, death may occur suddenly from an infection which in a healthy person would have only trivial results.

The radiation effects described above are the most severe which can follow a single whole-body dose of 500 roentgens of gamma rays and still allow some hope of survival; but at least half of the population so exposed would die."

Such would be the consequences of direct exposure to atomic bombs for those who were sufficiently protected to avoid being killed by the heat flash, which would kill all persons in the open over a wide area. Considerable doses of radiation would also be received by persons exposed to local fall-out down wind of an explosion, for distances which depend upon the wind velocity and the size and nature of the nuclear weapon, but might be a hundred miles or more. Lesser degrees of exposure have less obvious immediate consequences—150 roentgens would produce sickness, diarrhoea, fall in white blood cells, loss of hair, perhaps ulceration of the skin if it were directly contaminated with products of fall out, but probably no death; and 50 roentgens would have no obvious effect. The possible late effects of radiation will be discussed later.

These are the effects of atomic radiation which were seen at Hiroshima and Nagasaki in 1945 and were seen again in 1954 when the crew of the Japanese fishing vessel, *Fukuryu Maru*, were affected by radiation after the nuclear tests carried out by the United States in the Pacific Ocean. These were the horrors which were twice experienced by the people of Japan but which, if nuclear weapons were banned for ever, mankind may hope never to see again—except possibly as an occasional side effect of intensive radiation treatment for cancer, or in the presumably improbable event of a bad accident in a nuclear power station.

The effects already described are the consequences of large amounts of radiation which are only produced for a few hours or days after an explosion, before the short-lived fission products have had time to decay. The effects of small doses of radiation over a long period will now be discussed. The testing of nuclear weapons has already significantly and irrevocably increased the background radioactivity in the world. When a nuclear weapon is exploded, the radioactive fission products do not necessarily condense on dust particles and finally decay. The radioactivity is often drawn to much higher altitudes, to about 10,000 feet, and gradually spreads over a large part of the world. The radioactive fission products then settle down slowly on the earth usually reaching the ground in rain or snow. This global fall-out consists almost exclusively of the long-lived fission products, strontium 90 and caesium 137. In this respect it differs markedly from the local fall-out, in which the greater part of the activity is contributed by short-life fission products the effects of which have already been described. The effects of small doses of radiation from long-life fission products have been and will continue to be a great hazard to the human race. The greatest hazard from nuclear weapons is, of course, that more and more nations will come to possess them, and that sooner or later they will be used in a war, whose horrors and consequences would beggar description. The American, Russian and — to a lesser extent — British and French tests of these weapons have, however, already distributed sufficient extra radioactivity over the world to be detectable in all over bodies, and the importance of these consequences of nuclear weapon tests must now be considered.

The genetic effects of global fall-out from nuclear tests

In the global, as opposed to the local, fall-out from a nuclear explosion, the only elements which really matter are those whose rate of radioactive decay is slow enough for them still to be significantly radioactive when they return to earth from the stratosphere. The estimates of the time taken for this return to happen have recently been sharply revised. Whereas in earlier official discussions on fall-out the average length of time which the radioactive particles would spend in the stratosphere was reckoned at 10 years, actual time now appears to be nearer 2 or 3 years. Consequently, the radioactive materials from nuclear tests in the past five years have been and will be returning to earth sooner, and less spent, than was expected. In addition, fall-out of these materials, instead of spreading uniformally on this earth, has been found to concentrate in a band in the northern hemisphere between latitutdes 30° and 45° N. Such considerations, together with variations in rates of testing hydrogen bombs (which are most important where global fall-out is concerned) and new discoveries relating to the sorts of long-lived radioactive materials produced by them, have made prediction of fall-out rates very difficult. The latest attempt was made in the Report of the United Nations Scientific Committee on the Effects of Atomic Radiation, published in 1958. This Scientific Committee estimated that if nuclear tests were stopped by the end of 1958, then fall-out from tests already carried out might increase the genetically significant radiation to the gonads by less than 1 per cent in our immediate generation, and by a diminishing amount in subsequent generations. At the same time the dose of radiation to the bone marrow in a person's life time in this generation might be increased by anything from 2 to 14 per cent over that due to natural sources—*the higher figure applying to countries whose inhabitants derive most of the calcium in their diet from rice* rather than milk, and thereby lose the partial protection afforded by the fact that the ratio of radioactive strontium to calcium is less in milk than in the herbage grazed by the cow.

Should nuclear tests continue at the same average rate as over the period 1954-58, then in about a hundred years' time the genetically significant radiation would be increased some 4 per cent, and the dose to bone marrow would be increased from 40 to

240 per cent over the current background level. The figures for the genetically significant increase are almost certainly unrealistically low, because the report of the United Nation Scientific Committee could not take into account the very recent discovery that hydrogen bomb explosions create large amounts of a long-lived radioactive form of carbon (Carbon 14) by interaction of neutrons with the nitrogen of the atomosphere.[8] Radioactive carbon is being steadily produced all the time by 7 similar action of cosmic rays, but bombs tested to date are now estimated to have increased the amount by about 0.5 per cent. The reason why carbon 14 must be regarded seriously is not only that it takes thousands of years for its radioactivity to decay, but that it can actually be built into the nucleic acid of which the chromosomes of the germ cells are made. In this case it has the maximum chance of causing damage, even though at present it only contributes 1 or 2 per cent of the radiation received by the germ cells.

Figures such as these mean little unless they are interpreted. The most optimistic interpretation is that fall-out does little biological harm as to be negligible in effect, and that radioactive strontium 90 in the human bone is unlikely to produce a single case of cancer. This is the view usually favoured by those who regard possession of hydrogen bombs as essential for defence or as a stabilising factor for world peace. A more pessimistic interpretation is that present fall-out levels, by producing several hundred thousand genetic mutations per generation in the whole world, do great biological harm, and that already sufficient strontium 90 has been released to be responsible for hundreds of new cases of leukaemia in this and the next generation. These interpretations are not so much at variance as they may appear, since they depend upon the size of the population and the period of time considered.

If radiation in very low doses produces effects in proportion to its effects in high doses—which is not certain, but must at present be considered as likely as the converse—and if the effect is considered over the whole world population (for one or two generations in the case of bone cancers and for many generations to come in

8 *"Ralio-carbon from Nuclear Tests,"* W. B. Broecker & Olson, E. A., *Science*, 1960.

the case of genetic damage) then it is a matter of simple arithmetic, based on reasonable conjectures about the rate and mode of incorporation of fall-out products into living creatures, to make the calculations arrived at by DR. G. W. BEADLE in the *Scientific American* in September 1959. These are that, even if nuclear tests cease, fall-out from already exploded bombs would result in very roughly 480,000 individuals being born with new mutations in the world in a generation, assuming that 2,400,000,000 new persons were born in that time; most, but not all of these new mutations would be undetected. By similar calculations, based on the estimates of the United Nations Scientific Committee on the Effects of Atomic Radiation, there might be 400 to 2,000 or so additional deaths in the world from leukaemia in a generation. Neither increase would be noticeable against the much larger number of mutations nor leukaemia deaths which will occur inevitably from other natural causes. It is important to realise that these estimates are only reasonable guesses, and could be wrong by quite a large factor in either case. In discussions about the genetic dangers from radiation produced by nuclear tests, there are many uncertainties and conflicts of opinion but one definite principle is however emerging—it is the people with the most knowledge of the subject who seem to be the most alarmed.

In the last few pages, an attempt has been made to objectively present the scientific facts regarding the effects of atomic radiation, so far as they are known. From what is known at present, it is possible that nuclear weapon tests will cause a significant number of deaths and deformities among the population of the world; it is also possible that they will cause only a few deaths and deformities. There is a natural tendency among those who value the tests to think only in terms of the lowest estimate, while those who oppose the tests emphasize the highest. But no one can deny that the tests have harmful effects. The testing of nuclear weapons therefore raises moral and legal problems of a new kind. It has not previously been possible for any one nation to alter global environment in a manner clearly harmful to other nations. A nation or government accused of such contamination is naturally reluctant to face the issue squarely. Even though the harm done is still small, now that it has been proved that nuclear tests have harmful effects, the issue can no longer be evaded, for rightness and wrongness are qualitative, not quantitative.

The effects of the nuclear tests carried out by the United States in the Marshall Islands

It is proposed to examine the effects of the nuclear tests carried out by the United States because more accurate scientific information is available of the effects of the hydrogen bomb explosions in the Marshall Islands by the United States than there is of any other tests. Accurate information is available regarding the effects of these tests because the hydrogen bomb is so very much more destructive than the simple fission bombs tested by the United Kingdom and France, and also because the United States Government has itself released some information regarding the effects of these tests and the Japanese Government and Japanese scientists have investigated every aspect of the damage caused by the nuclear tests in the Pacific Ocean. Japanese scientists spent nearly three years collecting the scientific information on the effects of the hydrogen bombs exploded in the Marshall Islands from 1st March to 6th May 1954, and all the scientific information collected has been published in two volumes entitled *Research in the Effects and Influences of the Nuclear Bomb Test Explosions*. This is a monumental work of 1,824 pages to which Japan's most eminent scientists have contributed and the following pages of this chapter will be essentially a summary of the scientific information on the effects of nuclear tests contained in these two volumes, which is the most comprehensive analysis of the effects of nuclear weapons yet published.

The injuries caused to the Marshall Islanders

On 31st January 1950, President Truman of the United States ordered the United States Atomic Energy Commission to proceed with the development of the hydrogen bomb. On 1st March 1954, the first hydrogen bomb was exploded at Bikini Atoll and altogether six thermonuclear tests were carried out by the United States in the Marshall Islands from 1st March to 6th May 1954. The Marshall Islands are a trusteeship territory of the United Nations with the United States as the administering authority. The United States Atomic Energy Commission chose Bikini Atoll and Eniwetok in the trusteeship territory as the main sites for testing nuclear weapons and all the inhabitants of these and neighbouring islands had to be removed from their land and homes and taken elsewhere. Soon after the United States began its trustee administration in

1947, the United States authorities removed the 137 inhabitants of Eniwetok and settled them on another island, Ujelong. The 167 inhabitants of Bikini Atoll were also removed from their land and homes and settled on Kili, an island in the southern-most part of the Marshall Islands group. Bikini and Eniwetok, where the hydrogen bombs were exploded, will almost certainly never again be inhabitable by these islanders, who have therefore been permanently exiled from their land and homes by the trustee authority.

The first hydrogen bomb was exploded at Bikini on 1st March 1954, which released radiation and radioactive material that contaminated with deadly amounts of radiation an area of 10,000 square miles. The 'warning area' set up by the United States covered 50,000 square miles of the high seas around Bikini Atoll, but as Admiral Strauss, the Chairman of the U. S. Atomic Energy Commission reported:

> "Unfortuntely the wind had failed to follow the prediction and had shifted southwards, so that the islands of Rongelap, Rongerik and Uterik were in the path of the fall-out." [9]

These islands are about 150 miles away from Bikini but the inhabitants of these islands were seriously affected by radiation. According to the United States authorities, 'the prevailing winds were westerly so the bomb cloud moved generally to the east and about 160 miles down-wind from the point of the burst the early fall-out was observed in the form of fine white particles which looked like snow. It began to fall about eight hours after the detonation and continued to fall for several hours. It was subsequently discovered by Japanese scientists that 'the coral island itself had been vaporised by the heat of the explosion, and blown into the air as a gas, and had then recrystallized.' It were these crystalline particles, heavily contaminated with radioactive material, that fell like snow on the Pacific Islands and on the Japanese fishing vessel, the Fukuryu Maru, which was engaged in fishing eighty miles away, outside the so-called 'danger zone'.

According to the U. S. authorities "two hundred and thirty-seven people from Rongelap and Uterik had to be evacuated from their homes to a hospital on Kwajalein. Twentyeight American

9 *The Times*, 31st March, 1954.

servicemen on another island were also affected. Sixtyfour of the people on Rongelap had a dose of external radiation of 175 roentgens. Eighteen who were away on a fishing trip at the time got only 69 roentgens and the 157 islanders on Uterik had an average of 14 roentgens each." In the section of this chapter on the biological effects of radiation it was noted that a dose of 500 roentgens would kill about half of those people exposed to it over their whole bodies after an atomic explosion and that even after a dose of only 100 roentgens about 15 per cent of the exposed population would be affected and a few would die. It may be said therefore that the exposure of the Pacific Islanders to radiation was considerable and symptoms of radiation sickness, described earlier in this chapter, developed in a large number of cases. According to a report in the journal, *Science* (1955) about three-quarter of the people affected by radiation developed the usual symptoms of nausea, vomitting and diarrhoea together with itching and burning of the skin. This was followed by loss of hair and painful skin ulcers, particularly in the group of sixty-four from Rongelap who had suffered the maximum exposure. The radioactive dust had fallen "in the open cisterns that were used to store drinking water. Some of the food that was eaten had also picked up radioactive dust. The woven mat houses of the area were readily penetrated by the dust; and thus practically everyone down to the tiniest babies was irradiated." Up to the present no cancer, leukaemia or cataract has been observed in any of the islands, but all the children under twelve years who were irradiated appear to be a year behind in height and weight.

In May 1954, the United Nations received an urgent plea from the Marshall Islands for an immediate cessation of nuclear weapon tests in this region. According to *The Times* of 15th May 1954, "the petition was signed by eleven members of the Marshallese Congress Committee and by hundred interested Marshall Islands citizens." The petition stated that "the lethal effect of the bomb tests had already affected the inhabitants of the two Marshall atolls, Rongelap and Uterik, who were suffering in various degrees from lowered blood count, burns, nausea and the falling out of hair. Apart from the danger to their persons in case of another miscalculation, the inhabitants were concerned about the increasing numbers of people being removed from their land. Bikini

and Eniwetok were evacuated and their inhabitants moved to Kili and Ujelong. Because Rongelap and Uterik were now radioactive, their inhabitants were being kept on Kwajalein for an indeterminate time." The petition concluded by requesting the United Nations to bring about an immediate cessation of nuclear tests in the Marshall Islands.

The United States delegate to the United Nations, MR. CABOT LODGE, said that the United States Government was 'very sorry indeed' that some inhabitants of the Marshall Islands had suffered ill-effects from the nuclear tests and assured the United Nations that the United States authorities 'were doing everything humanly possible' to take care of everyone who was in the area. In 1956, a Mission from the United Nations Trusteeship Council, headed by SIR JOHN MACPHERSON of the United Kingdom, visited the Marshall Islands and reported that 167 inhabitants of Bikini Atoll who had been evacuated to the island of Kili, in the southern most part of the Marshall Islands group, were experiencing hardship on the island of Kili, which did not possess lagoons abundant with fish as around Bikini. The United States authorities told the United Nations Mission that all efforts to find a suitable unoccupied atoll for the Bikini inhabitants had failed. The United Nations Mission, in its unanimous findings, stated that the grievances of the Bikini people appeared to be serious as they had been deprived of their homes and the extensive lagoons abundant with fish around Bikini Atoll on which they had depended for their livelihood and food. The United Nations Mission recommended generous treatment for these unfortunate people, who had suffered from the effects of the nuclear tests. It is difficult to see how the United States, which holds these islands on trust, can repair such damage. The test island in Eniwetok Atoll was practically obliterated and a cavity one mile in diameter and 175 feet deep was torn out of the ocean floor. The coral island in the Bikini Atoll was itself vaporized by the heat of the explosion and blown into the air as gas. The two islands on which the hydrogen bombs were tested have virtually disappeared from the face of this earth.

The question of nuclear tests in the Pacific Islands was raised again in the United Nations on 16th June 1961 when the United States delegate, MR. JONATHAN B. BINGHAM, told the United Nations Trusteeship Council that the United States had no immediate plans to resume nuclear tests in the trust territory of the

Pacific Islands, but declined to give the Trusteeship Council an absolute assurance that no further tests would be carried out in the Pacific Islands. The delegate of the Soviet Union had raised the question when the Trusteeship Council considered the Report of a U.N. Inspection Mission that visited the territory early this year. The U.N. Mission had said that it had a statement from the United States administering authority that there were no plans to resume tests there and had expressed a hope that no such tests would be "carried out in the future." [10]

On 21st June 1961, the subject was discussed again in the United Nations when India called for the establishment of a territorial legislative council in the United States administered Pacific Islands trust territory by the end of the year 1962. MR. C. S. JHA, India's Permanent Representative at the United Nations, told the U.N. Trusteeship Council that the islanders, who were politically advanced, should not have to wait for the legislature until the scheduled period of 1965. India's statement was made when members of the Trusteeship Council were summing up their positions on the report of the visiting U.N. Mission and the answers of the United States authorities about political and welfare conditions in the islands. The delegate of India said that his country would like to hear from the United States that it would not in future carry out nuclear tests in the islands, a promise the United States had refused to make to the Soviet Representative in the previous discussion. The delegate of India said that in the meantime the United States Government should take steps to pay the islanders of Rongelap their money claims for radiation and fall-out damage caused by the tests carried out in the Marshall Islands in 1954. The Indian delegate, MR. JHA, noted with concern the visiting U.N. Mission's Report that the people at Rongelap had not as yet recovered from the effects of the tests carried out in 1954 and were still seized by fear and anxiety lest the test series be resumed. [11]

Radioactive pollution of the Japanese fishing vessel and the death of a Japanese national

At the time of the explosion of the first American hydrogen bomb at Bikini on 1st March 1954, the Japanese fishing vessel

10. *The Times*, 17th June, 1961.
11. *The Times*, 22nd June, 1961.

Fakuryu Maru (Lucky Dragon) was 80 miles to the east of Bikini Atoll, engaged in fishing. The *Fakuryu Maru* is a wooden tuna long-line boat of approximately 100 tons. When the hydrogen bomb was exploded at 3 a.m. on the morning of that fateful day, the crew of the vessel were engaged in fishing and some of the crew saw the flash of the bomb and then heard the sound of the explosion and witnessed the mushroom shaped bomb cloud. Approximately one and a half hours later white radioactive ash began to fall on the vessel and continued to fall for five hours until foot prints could be marked on the deck. According to the report of the skipper of the vessel, Captain Tsusui, the crew began to complain of headaches, nausea and itching of their bodies. In some cases the itching became almost unbearable and began breaking out in huge irregular blisters which were very painful. When the vessel reached the port of Yaizu on 14th March, all the twenty-three members of the crew had to be admitted in hospital. It was estimated by Japanese scientists that the ash on the boat had a radioactivity of 1 currie per gamma and that the total dose of radiation received by the fishermen was 270-440 roentgens per man.[12] Earlier in this chapter it was noted that a dose of 500 roentgens would kill about half of those people who were exposed to it over their whole bodies after a nuclear explosion and that even after a dose of 100 roentgens about 15 per cent of those exposed crew were affected by radiation and experienced the symptoms of radiation sickness previously described such as vomitting, diarrhoea, fall in white cells and, in some cases, ulceration of the skin and loss of hair. Although the utmost efforts were made by Japanese doctors to cure these cases, one of the patients, AIKICHI KUBOYAMA died in the Tokyo Hospital at 6.56 p.m. on 23rd September. The medical report states that MR. KUBOYAMA had been one of the serious cases since the beginning of the incident as he appeared to have received a particularly large dose of radiation. The United States authorities have maintained that MR. KUBOYAMA did not die from radiation exposure but rather from a liver disease caused by blood transfusions. Japanese pathologists disagree and consider his death directly due to radiation damage. Radioactive fission products were found in his liver and

12. Refer *Research in the Effects and Influences of the Nuclear Bomb Tests Explosions*, Vol. I, pp. 425-34: Investigations of the Radioactive Contamination of the *Fakurya Maru*.

radiation injuries were detected in his bone marrow, lymph nodes, spleen and testicles.[13] Although it may be important scientifically to know whether the death of this unfortunate man was caused by the radiation or the treatment used to counteract it, it is certain that he would not have died, nor would his companions have been injured, but for the hydrogen bomb test at Bikini.

The test explosion in the Bikini Atoll also affected with radiation sickness five members of the crew of a Japanese freighter which had passed 1,200 miles outside the test area, but the members of the crew of this vessel were not as seriously affected as the crew of the *Fakuryu Maru* and none of them died.

Pollution of the sea and the fisheries around Japan

During the summer of 1954 the Japanese were like a nation battling against plague. The first horror was the return of the fishing boat, the Lucky Dragon, with its decks and its crew covered with radioactive dust from the bomb. Then came the radioactive fish. Fish is the main food of the Japanese, but no fish was consumed during the summer of 1954. Most of the fish landed in Japan during that summer was dangerously radioactive and had to be thrown away. Fish prices fell, fish markets closed and fishermen were pauperised. The Government of Japan organised scientific expeditions which went thousands of miles across the Pacific testing the water, the plankton and the fish for radioactivity. The Japanese Government set up testing stations at the five ports of Tokyo, Shiogama, Misaka, Shimizu and Yaizu in Japan and examined all fish landed there from March to November 1954. A great campaign was organised to find out where the danger lay, how the fish became contaminated and when they were dangerous and when they were safe. Fish free from radioactivity and safe for consumption were placed on sale in the fish markets. Posters appeared in shop windows saying "We do not sell radioactive fish" but no one would buy and the fishermen were ruined.[14]

13. As to the medical details regarding Mr. Kuboyama and the other fishermen affected by radiation, refer, *Reasearch in the Effects and Influences of the Nuclear Bomb Tests Explosions*, Vol. II, Part VIII; *Medical Science*, pp. 1281-1402, particularly 'Pathological findings on Mr. Kuboyama', pp. 1371-1402

14. *Ibid*, Vol. II, pp. 1251-80: Economic Aspects of the Effects of the Bikini H-Bomb experiments on Japanese Fisheries.

Contamination of the Pacific Ocean

Radioactive pollution of the sea water took place both from the immediate fall-out from the bombs and from the flow of radioactive water from Bikini lagoons. The ashes falling into the sea made the water intensely radioactive and this radioactivity was carried far and wide by the ocean currents. It was taken northwestward in the North Equatorial Current and twelve hundred miles from Bikini, two months after the last test explosion, the Sea water still had twenty times the radioactivity permissible in drinking water. Radioactivity was found five hundred miles east-north-east of Bikini, revealing a hitherto unknown easterly ocean current in this area. Radioactivity was found in the fish in these regions and also in the small floating creatures (plankton) on which fish feed. Radioactive fish first began to be landed in Japan in the middle of March 1954 and all fish with a radioactivity of 100 counts per minute were declared by the Government to be unfit to eat. Maps were made of areas where radioactive fish were caught at different times during the summer to find out about migration of the fish in relation to the spread of polluted water from the Bikini lagoons.[15]

Radioactivity of the fish

The radioactive fish were first limited to the area round the Marshall Islands but by June radioactive fish had spread westwards to the Carolines and then northwards to an area from the east of Taiwan (Formosa) to the Bonin Islands. Fish so radio active as to be discarded were caught during the month of June 1954 in a great arc of radius, 2,000 miles from Bikini. Later radioactive fish migrated west and north and radioactive tunnies were caught around Japan itself where the sea water was free from radioactivity. All fish landed at the five designated ports in Japan during the summer of 1954 were examined for radioactivity and those showing a higher radioactivity than the standard laid down by the Japanese Government were discarded as unfit to eat.[16] The following table summarises the survey of the fish landed in Japan during the summer and autumn of 1954:

15. *Ibid*, Vol. II, pp. 825-838, "Studies on the Radioactivity of Fishes caught in the Pacific Ocean in 1954."
16. *Ibid*, Vol. II, pp, 1085-94: "Radiological Survey of the Fish landed in Japan at Five Ports."

RADIOLOGICAL SURVEY OF FISH LANDED IN JAPAN AT FIVE PORTS

1954 Months	No. of boats Surveyed	No. of catches condemned	Fish landed tons	Fish Discarded tons.
March	130	2	6013	61
April	375	17	12395	34
May	179	36	9576	16
June	277	41	7792	33
July	219	19	11173	7
August	345	32	8589	66
September	280	38	6960	45
October	238	53	8677	17
November	..	74	..	17
	2052	312	71175	356

Three hundred and fiftysix tons of fish had to be thrown away as unfit for human consumption. On 31st May, 1954, the United States authorities said that they "have no evidence of extensive contamination in tunas or other fishes by the nuclear tests at Bikini Atoll." The above table, based on the investigations of Japan's most eminent scientists, proves that there was extensive contamination in the fish in the seas around Japan after the nuclear tests in the Marshall Islands.

The people of Japan eat fish as their daily food and the fishing industry occupies an important position in Japan. The landing of radioactive fish caused prices to fall, until in September 1954, they were half what they were before the Marshall Islands tests. Since most Japanese fishing boats are operated on a 'share system' where each man gets a share of the takings, it was the fishermen themselves who suffered most as a result of the calamity. The general wage level of the fishermen fell to half what it had been before the tests. The area around Bikini itself cordoned off by the U.S. Government, where no ships were allowed, contained fishing grounds where one-fifth of the total tunny fish were normally caught and were the main spawning area of tunny. The radioactive pollution of the spawning grounds resulted in radioactive fish appearing in the Pacific for several months after the tests.

The fall of radioactive rain on Japan

The explosion of nuclear weapons in the Marshall Islands resulted in the fall of radioactive rain on Japan itself. Nuclear explosions at Bikini were recorded in Japan on 1st and 27th March, 6th and 26th April, and 5th May 1954. Radioactive rain fell on Japan on 6th-11th March, 6th and 17th-18th April, and 6th and 14th May 1954. The radioactivity was greatest on the east coast of Japan and in September 1954 a typhoon struck the north coast of Japan carrying radioactive rain. In the spring of 1955 there was again an increase of radioactivity in the rain, this time 22 days after the commencement of the United States tests in Nevada. The radioactivity of the rain recorded in Japan over this period of one year was a hundred to a thousand times greater than the maximum permissible in drinking water.[17]

As the rain fell, the radioactive material became attached to the vegetation and was washed into the soil and into the ponds, rivers and rainwater tanks. This had harmful effects as in some parts of Japan rain water collected in tanks is used for drinking and washing. For instance, on 9th May 1954, it rained at Sato Cape, the southern-most point of Japan, and six days later the light-house keepers and their families in Sato Cape developed diarrhoea and headaches and their blood and urine when examined showed radioactivity. The radioactive material in the rain fell on the leaves of plants on the soil and so got taken up into the plants through their roots. Vegetables bought at Otsu City and Kyoto markets at the end of June, 1954 showed a radioactivity of about a hundred times than permissible in drinking water. The leaves of lettuce and carrot were more radioactive than the carrot itself. Much of the radioactivity could be washed off the leaves of the vegetables before eating, but some remained, and the radioactivity in the roots could not be washed out. Radioactivity was found in vegetables and plants because strontium 90 from the fall-out from the nuclear tests had settled on the plants and had also seeped into the soil. [18]

17. *Ibid*,. Vol. I, pp. 151-60: Artificial Radioactivity in rain water observed in Japan, 1954, 1954-55.

18. *Ibid*,, Vol. I, pp. 809-16: "Radioactive Contamination of plants and agricultural products in Japan covered with rain—Fall Out from H-Bombs detonated in March-May 1954 at Bikini Atoll, Marshall Islands.

Thus, in Japan in 1954, the fish, the rain, the drinking-water, the vegetables, the dust on roofs and in houses all became radioactive; they were made so by the nuclear tests carried out by the United States in the Marshall Islands in 1954.

The effects of the nuclear tests carried out by France in the Sahara

The three original nuclear powers, the United States, the Soviet Union and the United Kingdom, had not conducted any nuclear tests since they began the nuclear test ban negotiations in Geneva in November 1958 until the recent resumption in August September 1961. The United States carried out several underground nuclear tests in October, 1958, but during 1959 no nuclear tests were carried out by any country. In 1960, France began a series of nuclear tests in the Sahara desert and has carried out four tests of atomic bombs upto date. The first three tests were carried out on 13th February, 1st April and 27th December 1960 and a fourth test was conducted on 25th April, 1961. All these tests were of atomic bombs and were carried out in the Sahara desert.

The nuclear tests carried out by France in the African Sahara have had harmful effects on neighbouring African States. It is reported in the *Nature Magazine* of 23rd June 1960 that Ghana suffered harmful effects from the first atom bomb exploded by France on 13th February 1960. Research scientists in Ghana detected an increase in radiation in the samples they examined and found that the harvest, the soil, the water and even the milk were affected by atomic radiation in Ghana after the first atomic test carried out by France on 13th February, 1960.

The effects of the second and third atomic bombs tested in the African Sahara on the territory of the United Arab Republic are described in a report prepared by the Faculty of Science of the University of Alexandria. The second test was carried out by France on 1st April 1960 about 3,400 kilometres to the west of the city of Alexandria and a marked change was noticed in the air over Alexandria on 11th April 1960 "where radiation increased up and down according to the direction of the wind." The radioactive fall out on 15th April 1960 reached at its highest point nearly fifty times double of what is normal. From 27th November 1960,

the radioactive fall-out continued to increase and reached its highest point over Alexandria from 25th to 28th December, 1960.

The third atomic test was carried out by France on 27th December 1960 and its effects were seen in Alexandria on the 8th January 1961. According to the report of Alexandria University, intensity changed according to conditions of weather. On 14th January 1961 its effect was several times double the normal amount. The wave of radioactive fall-out increased continually.

On 25th April 1961, France exploded her fourth atomic bomb for testing purposes in the Sahara. The bomb, described as of 'low power', was exploded from the top of a tower at the Reggane testing site in the Sahara. The official communique stated: "An atomic explosion took place today at 0500 G.M.T. on the top of a tower at the Reggane testing ground." France is also reported to have carried out underground tests at a site in the Hoggar mountains, a desolate range almost entirely denuded of vegetation in the southern Sahara.

The effects of underground nuclear tests

In 1957, the first nuclear test whose effects were totally confined underground was carried out by the United States in Nevada. A chamber six feet across was made 790 feet below the surface of a hill, by letting in to the hillside a horizontal excavation shaped corkscrew fasion, to contain the shock wave, with the bomb at the end of it. When detonated, there was the usual terrible explosion, though nobody saw it, with a momentary temperature of one million degrees and pressure of seven million atmospheres, and a suppressed pulse of radiation, including a violent shower of neutrons. In less than a tenth of a second, the chamber was puffed out like bubble-gum to 125ft. in diameter, coated inside with 800 tons of brightly glowing liquid rock. In a few minutes the temperature subsided, the lava began to run down the sides like coffee and drip from the roof, forming stalactites and stalagmites as it cooled. When solid, the lava set as a glass, and dissolved in it was 65–80 per cent of the radioactivity produced by the bomb. Gradually the heat and radioactivity leaded away, and the roof crumbled in, forming a chimney of broken and collapsed rock 400 feet high vertically above the cavity, but not reaching the surface. There was no fall-out, no movement of the soil surface, and only a relatively slight earth tremor.

Since the Rainier explosion, as the above explosion was called, there have been many underground nuclear tests in the United States, most of them entirely bottled up, radioactivity and all. On the basis of these tests, American scientists claim that it can now be planned with confidence how far to bury a bomb of a given size so that no radioactivity escapes. It is said that the general features of the underground explosion can now be predicted: what size of cavity will be made, how much energy will be generated, what temperature will be reached and how much rock will be melted. According to a statement issued on 25th September 1963, the United States has carried out 105 explosions underground. No accurate information is available regarding Soviet underground tests.

The Soviet resumption of nuclear tests in 1961

On 30th August 1961, the Government of the Soviet Union announced that it was going to resume the testing of nuclear weapons. This announcement was immediately followed by a nuclear test, which was carried out in Central Asia and resulted in the fall of radioactive rain on India, Japan and other neighbouring countries. This unilateral Soviet action terminated the unofficial moratorium on testing which was maintained since the Geneva negotiations began in November 1958 and the Government of the United States also announced that it has decided to resume the testing of nuclear weapons.

As far as is known, the Soviet Union has so far carried out about 121 atmospheric or surface tests since the first nuclear weapon was tested in Soviet territory in 1949. The new test series began within hours of the Soviet announcement that they were to resume testing. Right up to the time of that announcement, the Soviet Union was still taking part in the Geneva test-ban conference, which has been widely regarded as one of the most hopeful ways of reducing world tension and preventing the spread of nuclear tests by the conclusion of treaty banning such tests. The Soviet Union's unilateral resumption of nuclear tests effectively terminated the nagotiations and mankind was again faced with the hazards of atomic radiation as a result of the new Soviet test series. Large increases in radioactivity were recorded in Calcutta, Srinagar, Tokyo, Hiroshima and other cities of Asia as the majority of the Soviet tests appear to have been carried out in the Central

Asian region of the U.S.S.R. The Soviet tests caused further alarm in Japan, where it was reported that heavy and continuing radioactivity had been registered.

The Soviet Union conducted its first nuclear test in the new series on 31st August 1961 in the area of Semipalatinsk in Central Asia. The device tested had a substantial yield in the intermediate range and was detonated in the atmosphere. The explosion had been recorded by long-range detection apparatus in various countries and it was indicated that it was not a weapon in the 50 megaton range but was larger than the average atom bomb. The Soviet announcement on the resumption of tests had stated that Russia had projects for a series of nuclear bombs with yields equivalent to 50 million tons of T.N.T. The bomb dropped on Hiroshima had an equivalent of 20,000 tons of T.N.T.

The Soviet Union conducted another nuclear test on 3rd September in the Semipalatinsk area in Central Asia. The yield of the device was in the low kiloton range and the detonation again occurred in the atmosphere. On 5th September, the Soviet Union carried out its third nuclear test in the same area. On 6th September, the Soviet Union detonated its fourth nuclear device in an area east of Stalingrad. On 10th September, the Soviet Union carried out two nuclear tests in the vicinity of Novoya Zemlya, an island in the Arctic. This brought the number of explosions in the series to six tests in 11 days. One of the devices tested on the island had an explosive force equivalent to several millions ton of T.N.T. The Soviet Union continued to carry out further atomspheric tests in Central Asia and the Arctic during the months of September and October and on 23rd October the Soviet Union exploded a 50-megaton bomb in the Arctic island of Novoya Zemlya. The Soviet decision to resume nuclear tests was a plain reversal of their previous declaration that they would not start testing again unless the United States or United Kingdom first did so. It was a grave setback to the hopes kept alive that an agreement to ban nuclear tests might be reached at the Geneva negotiations and the world reaction to the resumption of Soviet tests was one of astonishment, alarm and distress. According to an announcement made by the United States Atomic Energy Commission on 25th September, 1963, the Soviet Union has carried out 121 atmospheric or surface tests, one underwater test and about three tests at

altitudes over 100,000 feet. No information is available regarding Soviet underground tests.

The American test series in 1962

On 2nd March 1962, the President of the United States announced that the United States would resume nuclear tests in the Pacific Ocean regions, and danger zones were established in the Pacific as from 4th April 1962 when the United States Atomic Energy Commission warned ships and planes to remain clear of a rectangular area of the high seas surrounding the British test base at Christmas Island, in the Central Pacific, and the American atoll, Johnston Island, in the mid-Pacific. Strong protests were lodged by a number of Asian countries, and particularly by Japan. In one of these Notes, Japan reserved the right to demand compensation for any losses suffered by Japanese fishermen as a result of these tests, and in another Note Japan protested against establishment of such a danger zone on the ground that it was violative of the principle of the freedom of the open sea. The United States, however, expressed the view that proper notification of a danger zone for vessels and aircraft within a portion of the high seas was in conformity with standard international legal procedures, and the test series in the Pacific Ocean commenced from 25th April 1962. The first nuclear test was carried out at 10.45 a.m. on 25th April 1962 in the vicinity of Christmas Island. This was followed by a series of nuclear tests which were carried out in the vicinity of Johnston and Christmas Islands. Most of these weapons were exploded at high altitudes, and one nuclear explosion of megaton range was reported to have been carried out 500 miles above the Pacific in the Johnston Island area in June 1962. This high altitude explosion was reported to have caused a temporary break in the earth's magnetic arc in space and sent particles of the Van Allen radiation belt cascading into the atmosphere, virtually eliminating the Van Allen Belt (i.e. the radiation belt surrounding the earth). The explosion of this hydrogen bomb at a eight of 500 miles above sea level caused a spectacular display of auroral light visible for thousands of miles. The disruption to communications from a test in the megaton range at a height of 500 miles was considerable and it was reported that trans-Pacific air traffic was grounded for some days. It was also reported that the explosion blacked out high frequency radio communication for some hours.

The United States continued to carry out nuclear tests in the Pacific Ocean region for several months. In the statement issued on the 25th September 1963, the U.S. Atomic Energy Commission announced that the United States has carried out about 170 atmospheric or surface tests, 10 tests at altitudes of over 100,000 feet, some of these actually in outer space and 6 underwater tests. Apart from these, it is estimated that the United States has carried out 105 explosions underground.

An assessment of the danger from radioactive fall-out

During 1961 and 1962 nearly two hundred atmospheric or surface nuclear tests were carried out by the Soviet Union and the United States, and it is estimated that these tests have released into the atmosphere more radioactive material than was contributed by all nuclear explosions during the previous fifteen years. Though it is possible to exaggerate the danger from radioactive fall-out, no one can seriously maintain that the danger does not exist. All radioactive fall-out is potentially harmful, and the United Nations Scientific Committee on the Effects of Atomic Radiation in its recent report published in 1962 had no hesitation in concluding that "it is clearly established that exposure to radiation, even in doses substantially lower than those producing acute effects, may occasionally give rise to a wide variety of harmful effects including cancer, leukaemia and inherited abnormalities.[19] The U.N. Scientific Committee is further of the view that "it is prudent to assume that some genetic damage may follow any dose of radiation, however small."[20] With regard to the world-wide contamination of the environment from nuclear tests, the U.N. Scientific Committee is of the opinion that the full effects of radiation exposures in human beings might not show up "for several decades in the case of somatic disease, and for many generations in the case of genetic damage.[21] The Committee states that "there are no effective measures to prevent the occurrence of harmful effects of global radioactive contamination from nuclear explosions,"[22] and comes to the conclusion that "a final cessation of

19. *Report of the United Nations Scientific Committee on the Effects of the Atomic Radiation, New York, 1962*, p. 35.
20. *Ibid.*, p. 35
21. *Ibid.*
22. *Ibid.*

nuclear tests would benefit present and future generations of mankind."[23]

Further material on the effects of nuclear tests is contained in the Report of the United States Atomic Energy Commission released on 8th May 1962. In this 700-page Report, entitled *The Effects of Nuclear Explosions* and published at the commencement of the new test series, the United States Atomic Energy Commission had made public for the first time the scientific data gained from previous nuclear tests carried out by the United States. The report estimated that 92 megatons of radioactive fall-out had been disseminated in the atmosphere by nuclear explosions conducted by the United States, Britain and the Soviet Union from 1945 to 1958. Considerable attention is devoted in the report to the U.S. nuclear test at Bikini on 1st March 1954, the effects of which exceeded official expectations and contaminated a wider area than that placed out of bounds to navigations. On this matter the report states that "the fission yield of the explosion and the height of burst, in the event of nuclear attack, are unpredictable." The report goes on to state that "consequently, it is impossible to determine in advance how far the seriously contaminated area will extend, although the time at which the fall-out will commence at any point could be calculated if the effective wind velocity and direction were known." The Commission also gives an account in its report of the visual effects of high-altitude explosions carried out in 1958 as part of the test series in Johnston Island in the Pacific Ocean. In one of these tests, a nuclear weapon was detonated at an altitude of 252,000 feet (nearly 50 miles) and in another a nuclear weapon was exploded at an altitude of 141,000 feet (nearly 27 miles). The Commission states that about a minute after the first explosion, the fireball had risen to a height of over 90 miles and was directly visible from Hawaii, over 700 miles away. As seen from Hawaii, the second explosion, referred to above, produced a bright flash in the sky above the horizon lasting for a fraction of a second and about a minute later, a greyish-white radioactive cloud was observed low on the horizon. The report discloses that the deepest underwater test carried out by the United States was the explosion of a 30-kiloton device 2,000 feet under the sea off the coast of lower California in May 1955. This test revealed the

23. *Ibid.*

devastating effects of nuclear energy when under the weight of thousands of feet of water and it was estimated that one mile from the point of detonation the pressure of 330 lbs. per square inch above normal sea pressure would have smashed the hull of a submarine.

The report of the Commission reveals that disruption of radar signals may occur as a result of ionisation from a nuclear detonation and confirms that the purpose of the high altitude tests in the Pacific in 1962 was to determine what effect an enemy's nuclear explosions would have on the early warning radar system of the United States. The report states that irregularities caused by a nuclear explosion can disrupt the radar and cluster or false echoes from ionised patches. The report, however, disputes the theory that nuclear testing has an effect on the weather and states that "the general opinion of the competent meteorologists, both in the U.S.A. and in other countries, is that apart from localised effects in the vicinity of the test area, there has been no known influence of nuclear explosions on the weather."

The United States Atomic Energy Commission acknowledges the possibility of a nuclear bomb being exploded accidentally and states in its report that the conventional high-explosive trigger device of nuclear bombs can be accidentally set off. The Commission expresses the opinion that "there is always the possibility that, as a result of accidental circumstances, an explosion will take place inadvertently", and goes on to state that "although all conceivable precautions are taken to prevent them, such accidents might occur in areas where the weapons are assembled and stored, during the course of loading and transportation on the ground or when actually in the delivery vehicle, e.g., an airplane or missile." The report discloses that "nuclear weapons contain varying amounts of highly explosive in addition to the fissionable material—the nuclear explosive" and states that it is the high explosive component (in the trigger mechanism) which comprises the main possible hazard.

The report of the United Nations Scientific Committee placed before the General Assembly in September 1962, the Report of the United States Atomic Energy Commission, released in May 1962, and the Report of the British Medical Research Council,

published in December, 1960[24] have presented the current state of knowledge of radiation exposure levels and have estimated the biological and genetic effects of atomic radiation. As the recent Soviet and American tests have, within the space of two years, released more radioactive material than was contributed by all nuclear explosions during the previous fifteen years, the danger from radioactive fall-out is now much greater than it was two years ago and it may, therefore, be the appropriate time to attempt to assess the hazards of atomic radiation in the light of the information available up to September 1963. The immediate and purely local fall-out from nuclear tests can perhaps be left out of a general evaluation of the hazards of nuclear tests as the recent Soviet and American test series have not been carried out in populated areas, and no immediate or direct damage has been reported as in the case of the earlier American tests in the Marshall Islands. It is the global fall-out from nuclear tests which now constitutes the greatest hazard. Even if the tests are carried out in areas which are not populated and even if the tests do not cause any immediate damage, every test carried out will still have harmful effects on the population of the world by adding its quota of harmful radioactive substances to the air, the land and the sea. This is so because every nuclear explosion results in the radioactive fission products being drawn into the stratosphere, and these fission products gradually spread over a large part of the world and return ultimately to the earth in the form of rain or snow. In the global, as opposed to local, fall-out from nuclear explosions, the elements which constitute a hazard to the human race are those whose rate of radioactive decay is slow enough for them to be still significantly radioactive when they return to the earth from the stratosphere. Among these by far the most pernicious are radioactive strontium, radioactive caesium and radioactive carbon.

Strontium 89 and strontium 90 each compose about 5 per cent of the fission products of an atomic bomb and it is estimated that strontium 90 has a half-life of 28 years, while strontium 89 has a half-life of only 58 days. It is, therefore, strontium 90 which is most dangerous since its radioactivity decays more slowly and it remains a dangerous source of radiation when it ultimately returns

24. *The Hazards to Man of Nuclear & Allied Radiations*, H.M.S.O. London, December, 1960.

to the earth in global fall-out from the stratosphere. Radioactive strontium from fall-out settles on plants and also seeps into the soil. That which settles on plants is the most dangerous, since it may be grazed by cattle or eaten by man. After being eaten with the food, strontium is readily absorbed into the body and becomes incorporated into the bones of the person. Strontium also becomes concentrated in milk and all cow's milk throughout the world has been found in recent years to contain increasing amounts of radioactive strontium. Since strontium is easily absorbed into the body and is incorporated in bone, it is primarily an internal hazard and the hazard from strontium is somatic. The chief danger is of cancer due to irradiation of tissue in the neighbourhood of strontium deposited in the bone and radiostrontium can also induce leukaemia. In countries, where people derive their food intake mainly from cereals and vegetables, the dietary level of radioactive strontium is likely to be high because strontium from fall-out settles mainly on plants and crops, such as wheat and rice. The gravity of the strontium hazard for Asian peoples is therefore very great and the U.N. Scientific Committee has shown that the hazard for an Asian country receiving most of its dietary calcium from rice is much greater than that for an European country in which cereals do not form the main food.

In radioactive fall-out, another dangerous element is caesium 137. Radioactive caesium composes about 6 per cent of the fission products of an atomic bomb and decays with half-life of 33 years, giving off beta—and gamma-rays. It is dangerous because caesium chemically resembles potassium, and like it is concentrated inside plants and animal tissue cells. Just as strontium enters the "food chain", so does caesium, but instead of settling in the bones, caesium is distributed through the body. Its hazard is due mainly to the fact that its radioactivity contributes to the radiation dose received by the gonads and the danger from radio-caesium is mainly genetic. By subjecting the reproductive cells to gamma-rays, radio-caesium can cause grave genetic defects in succeeding generations. It is now generally accepted that the elements of radioactive caesium in global fall-out will cause genetic damage.

It has been recently discovered that thermonuclear explosions create large amounts of a long-lived radio-active form of carbon,

carbon 14, by interaction between neutrons liberated by hydrogen bombs and the nitrogen of the air. In each megaton explosion, some 7-8 kilograms of carbon 14 are generated. The reason why carbon 14 must be regarded as a great hazard is the fact that it decays very slowly. It has been estimated that radio-active carbon has a half-life of more than 5,000 years It takes thousands of years for its radioactivity to decay and it is dangerous because all living matter contains large amounts of carbon, derived ultimately from carbon dioxide from the air. Since carbon 14 lasts so long, it has a much increased chance of getting into body constituents, including even the nucleic acid of the germ cells. The hazard is difficult to assess accurately as radioactive carbon is being steadily produced all the time by a similar action of cosmic rays, but in 1960 it was estimated that the nuclear tests already carried out had increased the amount of radioactive carbon by about 0.5 per cent. These amounts of radiocarbon have been synthesised during nuclear testing and injected into the earth's carbon cycle, specifically into the atmosphere.

Other harmful elements in radioactive fall-out are iodine 131, manganese 54, zinc 65 and cobalt 60, but these elements are relatively short-lived and therefore do not constitute as great a hazard as strontium 90, caesium 137 and carbon 14. Radioactive iodine composes about 3 per cent of the fission products of an atomic bomb. It is relatively short-lived, having a half-life of only eight days, and emits beta-rays and gamma-rays. Owing to its rapid rate of decay, iodine 131 from nuclear tests is not likely to be accumulated in damaging doses, but it is often detected in the thyroid glands of cattle soon after an explosion. It can, therefore, represent a temporary hazard in the neighbourhood of nuclear explosions. This is so because iodine cannot only be eaten or inhaled directly but is also rapidly concentrated and excreted in the milk of cattle grazing on contaminated herbage. In the form of milk it could be consumed by man in significant amounts. Iodine becomes concentrated in the thyroid gland, where, particularly in young children, it can kill the cells or cause cancer to appear if accumulated in large doses. On account of their proximity to the Soviet explosion sites in the Arctic, special attention to this danger is being given in high-altitude areas in the northern hemisphere where careful checks of radio-iodine in milk have been carried out.

Manganese 54, which has a half-life of 310 days, zinc 65 which has a half-life of 250 days and cobalt 60, which has a half-life of about 5 years, have been proved to be produced in considerable amounts by hydrogen bomb explosions. All these elements are selectively accumulated in certain tissues in plants, fish and animals, and can produce harmful effects in tissues in which they accumulate. As they are relatively short-lived, radioactive elements of this kind do not constitute a hazard in global fallout, but they may represent a temporary hazard in the neighbourhood of nuclear explosions. Of these elements, cobalt 60 is potentially dangerous as it remains sufficiently active to cause damage even after a few years. During recent years reports have appeared of another new fall-out material, namely a mixture of zirconium 95 and niobium 95, both of which are powerful beta-and gamma-ray emitters, with half-lives of 65 and 35 days respectively. They appear to have originated in the 1957-58 series of tests, and first received public notice because their presence in packaging materials, such as straws, was ruining photographic films by fogging. Particles of zirconium 95 and niobium 95 were detected in the air over Europe, and were found to become concentrated in the lungs. Because their half-lives are short, these materials soon die away once tests are stopped and they do not constitute a hazard in global fall-out.

In the global fall-out from nuclear explosions, the only elements which constitute a hazard are those, such as strontium 90, caesium 137 and carbon 14, whose rate of radioactive decay is slow enough for them to be significantly radioactive when they return to the earth from the atmosphere. The estimates of the time taken for this return to happen have recently been sharply revised. Whereas in earlier scientific discussions on fall-out the average length of time which the radioactive particles would spend in the stratosphere was reckoned at 10 years, the actual time now appears to be nearer 2 or 3 years. Consequently the radioactive materials from tests in the past five years have been and will be returning to earth sooner, and less spent, than was expected. In addition, fall-out of these materials, instead of spreading uniformally on this earth, has been found to concentrate in a band in the northern hemisphere between latitudes 30° and 45°N. Such considerations together with variations in rates of testing hydrogen bombs and the new discovery relating to the long-lived radioactive element

of carbon 14, have made prediction of fall-out rates very difficu t. Any assessment of the extent of possible damage can therefore only be very rough. Strontium 90 did not exist on earth until it was produced by the explosion of nuclear weapons and its presence in human bone is the direct consequence of nuclear testing. So far as the strontium hazard is concerned, therefore, the key question which needs to be answered is whether there is a level below which radiostrontium concentration in bone is harmless. Most experts are now of the opinion that while there may be a maximum level of safety in respect of bone cancer, it is unlikely that such a level or threshold exists for the causation of leukaemia; this means that fall-out in the form of radioactive strontium will increase the incidence of laukaemia, while the possibility of increase in bone cancer is less certain. At present fallout levels, it is estimated that sufficient strontium 90 has already been released to be responsible for hundreds of new cases of leukaemia in this and the next generation. With regard to the caesium hazard, a direct linear relation between the gamma radiation dose and the probability of genetic damage is now generally accepted and most experts agree that fall-out in the form of caesium 137 will certainly cause genetic damage, which might not show up for many generations. The hazard from carbon 14 is difficult to assess accurately, for the reasons already given. To sum up, it may be said, therefore, that global fall-out from nuclear tests will definitely cause genetic damage and most likely increase the incidence of leukaemia, but the possibility of an increase in bone cancer is less certain on the basis of present knowledge.

CHAPTER II

Nuclear Tests, Tortious Liability and State Responsibility

The object of this Chapter is to consider the question as to whether nuclear tests raise issues of State responsibility. The effects of the tests as apparent from scientific evidence cannot be confined to the territory of the State carrying out the experiments, and they may result in injury to the nationals and territory of other States. The scientific information on the effects of nuclear tests set out in Chapter I has clearly shown that nuclear tests result in local and global radioactive fall-out and that the biological and genetic effects of atomic radiation constitute a great hazard to the human race. The testing of nuclear weapons, therefore, raises legal problems of a new kind, because it has not been previously possible for any one nation to alter the global environment in a manner clearly harmful to other nations. The tests carried out by the United States in the Pacific Islands, the tests conducted by France in the African Sahara and the tests carried out by the Soviet Union in Central Asia and the Arctic have had harmful effects on neighbouring States. It is for consideration whether and in what circumstances a State by carrying out nuclear tests can be said to commit an international tort.

In order to ascertain whether questions of tortious liability and issues of State responsibility arise as a result of damage caused by nuclear tests, it is first necessary to examine the principles of tortious liability and State responsibility in international law with a view to determining whether these principles of international law are applicable to the situation arising out of these tests. At the outset, it will therefore be necessary to discuss and ponder over the question as to whether the accepted principles of international law relating to State responsibility and tortious liability can be applied to new situations arising out of these tests on the basis of the evidence collected in Chapter I. If the existing principles of international law are not applicable, or if such as are applicable are not adequate to meet the new situation arising out of the hazards of these tests, it will be necessary to consider whether any extensions or analogies of the existing principles of international law are

possible. Finally, it will be a matter for consideration whether international law, which has in several cases in the past met new situations by evolving new principles, could in the present case similarly attempt to counter the grave threat to which States generally are exposed by the holding of these tests by the formulation of a suitable doctrine. If the existing rules of international law are inapplicable, it may be necessary to formulate new rules of international law to meet the new situation, since nuclear tests raise legal problems of a new kind as it has not previously been possible for any one nation to alter the global environment in a manner clearly harmful to other nations. A nation or government accused of such world contamination is naturally reluctant to face the issue squarely, but now that significant harm has been proved the issue can no longer be evaded. The whole question is clearly one of utmost gravity and of the greatest difficulty, but this should not discourage any attempt to move forward along boldly constructive lines.

State responsibility and the abuse of rights.

State responsibility arises as a consequence of a breach or non-performance of an international obligation, and the State which has committed the wrongful act or omission has a duty to make reparation for the injury caused. Wherever responsibility lies, there also lies a duty to make reparation. This is the traditional view of State responsibility prevailing in the abundant legal literature on the subject. Eagleton commences his leading treatise on *State Responsibility in International Law* with the following discourse:

> "The study of the responsibility of States in international law involves an examination of the theory upon which reparation may be demanded by one state or another, and of the process by which it may be obtained. The members of the community of nations have, in practice, agreed to respect certain principles for their mutual guidance and, in doing so, it has been understood that they were thereby accepting obligations to observe the conduct prescribed. The failure to meet these obligations imposes upon the guilty State the further obligation to make reparation for the injury caused."[1]

According to Eagleton, "responsibility is simply the principle

1. Eagleton, *The Responsibility of States in International Law*, 1928, p. 3.

which establishes an obligation to make good any violation of international law producing injury, committed by the respondent State".[2] A similar view is expressed by Anzilotti in his learned work entitled "Corso di Diritto Internazionale":

> "When a wrongful act—by which is meant, as a rule, the violation of an international right—is committed, the consequence is that a new relationship comes into existence, in law, between the State to which the act is imputable (that State being under a duty to make reparation) and the State with respect to which there exists an unperformed obligation (this State having a claim to reparation). This is the only effect that the rules of interntional law, as laid down in the reciprocal undertakings of States, can attribute to the wrongful act."[3]

The rules of international law relating to State responsibility are therefore concerned with the circumstances in which, and the principles whereby, the injured State becomes entitled to redress of the damage suffered. The acts or omissions which give rise to State responsibility are of two kinds: (1) acts which affect a State by injury to the interests or rights of that State as a legal entity, and (2) acts which cause damage to the person and property of its nationals. In most cases the injured State will claim satisfaction through diplomatic channels and may be statisfied with a formal apology, but in more serious cases where there has been material loss or damage, pecuniary reparation may be necessary and the matter may have to be placed before an arbitral tribunal. State responsibility arises if the act or omission violates a rule of international law and the wrongs or injuries which give rise to State responsibility may be of various kinds. Thus a State may become responsible for breach of a treaty or of other contractual obligation or State responsibility may arise as a result of injuries to citizens of another State. Every neglect of an international duty constitutes an international delinquency and the injured State can claim redress. State responsibility may also arise as a result of an abuse of a right enjoyed by virtue of international law. "This occurs when a State avails itself of its right in an arbitrary manner in such a way as to inflict upon another State an injury which cannot be justified by a legitimate

2. *Ibid*, p. 221.
3. Anzilotti, Corso di Diritto Internazionale, 1928, p. 416.

consideration of its own advantage."[4] The International Court has expressed the view that "in certain circumstances, a State, while technically acting within the law, may actually incur liability by abusing its rights"[5] and individual judges of the court, such as Judge Azevedo, Judge Alvarez and Judge Anzilotti, have referred to this principle in their judgments.[6] Oppenheim observes that "the maxim, *sic utere tuo ut alienum non laedas*, is applicable to relations of States no less than to those of individuals; it underlies a substantial part of the law of tort in English law and the corresponding branches of other systems of law; it is one of the general principles of law recognised by civilized States which the Permanent Court is bound to apply by virtue of Article 38 of its Statute".[7] The doctrine of the prohibition of abuse of rights is, however, of recent origin in international law and the precise extent of its application is still controversial.

Very few writers on international law have examined the question of the applicability of the doctrine of abuse of rights in international relations. The question was first considered officially at the Proceedings of the Advisory Committee of Jurists in 1920 when this august body was drafting the Statute of the Permanent Court of International Justice. When Article 38 regarding the sources of international law was being discussed, Ricci-Busatti, the Italian member of the Committee, expressed the view that the principle 'which forbids the abuse of rights' was one of the 'general principles of law recognised by civilized nations' and was of the opinion that the Permanent Court should apply this principle when deciding cases referred to it. As an illustration of the doctrine he quoted the varying limits of the breadth of the territorial sea and said that in such a dispute the Court might "admit the rulings of each country in this regard, as equally legitimate insofar as they do not encroach on other principles, such as that of the freedom of the seas."[8]

In his lectures at the Hague Academy of International Law in 1921, Politis expressed the view that the doctrine of the abuse of

4. Oppenheim, *International Law*, Vol. I (1957), p. 345.
5. *Free Zones of Upper Savoy & the District of Gex;* Series A, No. 24, p. 12 and Series A/B, No. 46, p. 107.
6. Refer particularly Judge Alvarez in *Admission (General Assembly) Case*, I. C. J. Reports, 1950, p. 15.
7. Oppenheim, *op. cit*, Vol. I, (1957), pp. 346-47.
8. Ricci-Busatti, Proceedings of the Advisory Committee of Jurists, 1920, pp. 315-316

rights was of great importance for the development of international law relating to State responsibility and advocated its progressive application as one of the 'general principles of law' referred to in Article 38 of the Statute of the Permanent Court.[9] In 1933 in his treatise on *The Function of Law in the International Community*, Lauterpacht was of the opinion that the doctrine of the abuse of rights was 'one of the basic elements of the international law of torts',[10] and in a recent treatise on *The Abuse of Rights in International Law*, published in 1953, Kiss has expressed the view that the prohibition of the abuse of rights is 'a general principle of international law'.[11] Schwarzenberger, on the other hand, is of the opinion that "in the cases and situations usually mentioned in support of the recognition and applicability of the doctrine of international law, there have been no real abuse of rights but breaches of a prohibitory rule of interntional law".[12] Cheng considers the theory of abuse of rights as 'recognised in principle both by the Permanent Court of International Justice and the International Court of Justice' and is of the opinion that the doctrine is merely—an application of the principle of good faith to the exercise of rights. In his treatise on *The General Principles of Law* this author gives a comprehensive analysis of the various applications of this doctrine in practice.[13]

A survey of the jurisprudence of the International Court of Justice and the Permanent Court of International Justice clearly shows that the basic principles of the prohibition of abuse of rights have been applied in cases. In the *German Interests Case* (1926) the Permanent Court of International Justice held that "Germany undoubtedly retained until the actual transfer of sovereignty the right to dispose of her property". The treaty obligations assumed by Germany did not, therefore, directly affect her proprietory rights, including the right of alienating property. The Court added, however, that "a misuse of this right could endow an act of alienation with the character of a breach of the Treaty."[14] It follows, therefore,

9. Recueil des Cours de L' Academie de Droit International, 1925, Vol. 6, p. 108.
10. *The Function of Law in the International Community*, 1933, p. 298.
11. L'Abus de Droit en Droit International, 1953, pp. 193-196
12. Recueil des Cours de L'Academie de Droit International, 1955, Vol. 87. p. 309.
13. *General Principles of Law as applied by International Courts & Tribunals*. 1953, pp. 121-136.
14. P.C.I.J., Series A, No. 7, pp. 30-37

that a legitimate exercise of the right of alienation was compatible with the treaty obligations, while an abuse of this right, i.e. an exercise of the right contrary to the principle of good faith, would be incompatible therewith. While the *bona fide* exercise of the right would be compatible with Germany's treaty obligations, its exercise contrary to the principle of good faith would constitute an abuse of right and a breach of these obligations, i.e. an unlawful act. In the *Free Zones Case* (1932) the Permanent Court applied the same principle in a case where France was under treaty obligations to maintain certain frontier zones with Switzerland free from customs barriers. The Court, while recognising that France had the sovereign and undisputed right to establish a police cordon at the political frontier, held that : "A reservation must be made as regards the case of abuse of a right, since it is certain that France must not evade the obligation to maintain the zones by erecting a customs barrier under the guise of a control cordon".[15] The principle underlying this opinion is that international law prohibits the evasion of a treaty obligation under the guise of an alleged exercise of a right. The principle of good faith requires every right to be exercised honestly and loyally. Any fictitious exercise of a right for the purpose of evading either a rule of law or a contractual obligation constitutes an abuse of the right, prohibited by law. In 1951 the International Court of Justice, when considering the right to draw straight line bases for the purpose of delimiting the territorial sea, mentioned the 'case of manifest abuse' of this right in the *Anglo-Norwegian Fisheries Case* (1951).[16]

The doctrine of the abuse of rights has also been applied by municipal courts, arbitral tribunals and claims commissions. The Mexican-United States General Claims Commission, for example, expressed the following opinion, on the matter in the *North American Dredging Co. of Texas Case* (1926):

> If it were necessary to demonstrate how legitimate are the fears of certain nations with respect to abuses of the rights of protection and how seriously the sovereignty of those nations within their own boundaries would be impaired if some extreme conception of this right were recognised and enforced, the present case would furnish an illuminating example.

15. P.C.I.J., Series A/B, No. 46, p. 167.
16. I.C.J. Reports, 1951, p. 142.

The General Claims Commission referred to the 'worldwide abuses either of the right of national protection or of the right of national jurisdiction' and declared that:

> The present stage of international law imposes upon every international tribunal the solemn duty of seeking for a proper and adequate balance between the sovereign right of national jurisdiction, on the one hand, and the sovereign right of national protection of citizens on the other. No international tribunal should or may evade the task of finding such limitations of both rights as will render them compatible with the general rules and principles of international law. Every right of a State is, therefore, subject to such limitations as are necessary to render it compatible with its obligations under general international law.[17]

The principles underlying the doctrine of the abuse of rights may also be illustrated by the decision in the *Trail Smelter Arbitration*.[18] The question in issue was that of State responsibility for nuisance to adjacent territory as the claim related to damage done in the United States to crops, pasture lands, trees and agriculture generally as well as to livestock as the result of sulphur dioxide fumes emitted from a smelting plant in British Columbian Canada. In this case, therefore, there was, on the one hand, the right of a State to make use of its own territory, and, on the other hand, the duty of a State at all times to protect other States against injurious acts individuals within its jurisdiction. Taking into account the conflicting interests at stake and the analogous cases in municipal law, the Tribunal arrived at the following conclusion:

> Under the principles of international law, as well as of the law of the United States, no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence.[19]

The Tribunal held Canada liable on the ground that there was a violation of the obligation to protect other States from injuries emanating from its territory and this violation constituted an abuse

17. *Opinions of Commissioners*, 1927, p. 23.
18. Annual Digest, 1938-40 Case No. 104.
19. Annual Digest, 1938-1940, Case No. 104.

of right, an unlawful act. While acknowledging that it knew of no previous international decision concerning air or water pollution, the Tribunal cited the decision of the Federal Court of Switzerland in *Solothern* v. *Aargan* relating to target practice[20] and the decision of the United States relating to pollution in *State of Missouri* v. *State of Illionois*.[21] The Tribunal clearly regarded the general principle of the duty of a State to protect other States from injurious acts within its jurisdiction, which it traced back to the *Alabama Claims Arbitration*, as of wider application. It is for consideration, therefore, that if a State uses its own territory for conducting nuclear tests, whether in such a case injury due to atomic radiation is as much a ground of liability as injury due to noxious fumes on the principles laid down in the *Trail Smelter Arbitration*.

International torts and tortious liability

'The breach of any obligation consitutes an illegal act or international tort' and 'the commission of an international tort involves the duty to make reparation'.[22] The terms 'international tort' and 'international illegal act' are merely synonyms for 'the breach of international obligations'. "Thus the breach of any international obligation, whether it rests on *lex inter partes* of a treaty, a rule of international customary law or a general principle of law recognised by civilised nations, constitutes an international tort".[23] An international tort may therefore be defined as an unjustified, unpardoned, imputable and voluntary breach of an international obligation. In international law, however, the law of torts is confined to very general principles and is still in a process of development. The application of the principles of tortious liability to international situations is still in the stage of debate and experiment and abounds in unsettled and controversial questions. The progress made by international tribunals in developing international application of private law concepts has been less far-reaching in respect of matters of tort than in respect of matters of property, contract, succession, evidence, procedure and damages.[24] The absence of any clearly

20. Refer Schindler, "The Administration of Justice in the Swiss Federal Court in International Disputes", 15 *American Journal of International Law*, 1921, pp. 121-174.
21. 200 U.S. 496, 521. J.B. Scott, *Judicial Settlement*, 1918, Vol. II, p. 1464.
22. Schwarzenberger, *International Law*, 1957, Vol. I, p. 562.
23. *Ibid.*, p. 582.
24. For a study of the international applications of private law concepts refer Lauterpacht, *Private Law Sources & Analogies of International Law* (1927).

settled authorities on questions of tortious liability in international law, however, need not necessarily dispose of the matter. International law, like other branches of law and perhaps more so, is constantly developing and is influenced by new principles arising out of international relations. This century has seen great technological, scientific, political, economic and social changes and if the basic principles of domestic law have undergone drastic changes, there is no reason why international law should not develop in the same manner. The general theory of tortious liability in municipal law has been adapted in modern times to the needs of an industrialised society. In English law, for instance, 'the segregation of the law of tort from other parts of law is quite modern',[25] and it was in the first quarter of the twentieth century that the great English jurist, Sir Frederick Pollock, developed a general theory of tortious liability and formulated the new principles of toritous liability which were necessary to adapt the law of torts to the needs of an industrialized society.[26] Is it possible and desirable that international law on the subject may develop in the same manner? Sir Frederick Pollock has observed that "all members of a civilised commonwealth are under a general duty towards their neighbours to do them no hurt without lawful cause or excuse'.[27] Is the international community of sovereign States a 'Civilised Commonwealth' in this respect? Is there a place in contemporary international law for 'the general principle that one must not do unlawful harm to one's neighbours,'[28] and, if so, is there an international tort involving the legal liability of a State for damage caused by nuclear tests? It is submitted that there is nothing inherently unreasonable in the conception of such an international tort as there may well be an analogy with the liability for breach of absolute duties attached to the ownership and custody of dangerous things in municipal law. The proposition that harm to one's neighbours resulting from nuclear tests might be regarded as an international tort calls for fuller consideration.

During the last decade a radical change has taken place in the geography of international law as a result of the emergence of forty independent Asian African States, and if any new principles of international law are formulated, it will be necessary to take into

25. Winfield, *The Province of the Law of Tort* (1931), p. 8.
26. Refer Pollock, *The Law of Torts* (1929), Chapter I.
27. *Ibid.*, p. 1.
28. *Ibid.*, p. 6.

consideration not only the general principles of law of European countries to which international law had recourse in the past, but also the general principles of law of Asian African countries, such as traditional Islamic law, Japanese law, traditional Chinese law and African customary law. The formal definition of the sources of international law embodied in Article 38 of the Statute of the International Court has now won world-wide acceptance and 'the general principles of law recognised by civilised nations' are universally accepted as a third source of international law. Contemporary international law may accordingly be fertilized and progressively developed by recourse to the general principles of law of the major legal systems of Asia and Africa. As Professor Milton Katz, Director of International Legal Studies at Harvard University, so wisely said :

> Public international law represents essentially a limited part of the thought, and a limited part of the diplomatic experience, of a small number of Western European countries during the past three or four centuries. It is a limited and rudimentary legal system. Why not draw also on the experience of larger and more mature legal systems of, let us say, Japan, China, the Middle East, and India. Each of these legal systems represents an immense body of experience and the traditions and values of important and ancient civilizations. We feel that the contribution of law and lawyers to a just and workable international order will be greater if all of these legal systems are taken as our sources and not just a particular one to which the term' international law' has been traditionally applied.[29]

Therefore, as Roscoe Pound enunciated, "if we are to proceed wisely in creative juristic activity in the complex society of today, we must study scientifically the legal materials of the whole world".[30]

It is clear, therefore, that in cases where neither international convention nor custom furnish a satisfactory rule of law, a rule of international law may be deduced from the general principles of law recognised by civilised nations, and these principles include the ge-general principles of law of all the major legal systems of the world. Can we accordingly deduce a sufficient consensus of general princi-

29. *Report of International Law Conference*, held at Niblett Hall, Inner Temple, London, June 1956, p. 41.
30. *Tulane Law Review*, Vol. 5, (1930), p. 15.

ples regarding liability for harmful acts to one's neighbours from legal systems so varied as the Civil Law with its multifarious European, Latin American and other variants, the Common Law and the Islamic Law, with their variants, Hindu Law, Chinese Law, Japanese Law, African Law in its varied forms and Soviet Law? Do the major legal systems of Europe, America, Asia and Africa recognise a general obligation not to inflict unlawful harm on one's neighbour? All the major legal systems of the world have been profoundly influenced during the past three centuries by either the Civil Law of Europe or the Common Law of England. Latin American Law, for instance, is essentially a projection of the Civil Law of Spain and Portugal.[31] Traditional Islamic Law survives, without substantial civil law influence, only in Yemen and Saudi Arabia.[32] In Turkey, the Islamic and Ottomon Law[33] have been profoundly modified by the adoption of the *Swiss Civil Code*, the *Neuchatel Civil Procedure Code* and the *Italian Penal Code*.[34] In the United Arab Republic, Egyptian law has been greatly influenced by the French Codes, and Syrian law has been recast on the basis of the *Egyptian Civil Code*,[35] while in Lebanon, Morocco, Tunisia and Algeria French law has exercised wide influence. In Iraq, Islamic law and Ottoman law have been modified by English Commercial Law and in Iran the *Civil Code* of 1928, *Criminal Code* of 1926 and the *Commercial Code of* 1925 represent a compromise between Islamic law and western models. In Indonesia and Malaya, Islamic law, modified by the influence of western legal systems has been superimposed upon earlier systems of indigenous law such as the 'adat law' of Malayasia and in India, while matters of personal status, marriage, family relations, succession and inheritance are determined by indigenous Hindu and Muhamedan law, all other branches of law are in effect statutory re-statements of English Common Law adapted to Indian conditions, e.g. *Indian Contract Act, Indian Sale of Goods Act, Indian Partnership Act, Indian Evidence Act, Indian Penal Code, Indian Codes of Civil*

31. Refer P.J. Edor, *A Comparative Study of Anglo-American and Latin American Law.*

32. Louis Milliot, 'Introduction a l' etude du droit musulman (1953), Ch. VII, 'Le droit musulman et les influences occidentales' pp. 770-783.

33. Refer Young, Corpns du droit Ottoman (1907).

34. For an analysis of this reception and its consequences, refer "*The Reception of Foreign Law in Turkey*" T.B. Balta, C.J. Hamson, K. Lipstein and others, 9 *International Social Science Bulletin* (1957) pp. 7-81.

35. Refer F.P. Walton, *The Egyptian Law of Obligations* (2nd Ed.), 2 Vols.

and Criminal Procedure.[36] During the twentieth century, Japanese law has been widely influenced by western legal systems, and in the comprehensive legislative changes introduced before the last World War Japan based her reforms to a large extent on the constitutional and legal system of Germany and to a lesser extent, as regarding the civil law in particular, on France.[37] Since 1945 American influence is evident, particularly with regard to commercial law, criminal practice and constitutional law. In the continent of Africa, English, French, Belgian, Portuguese and Roman-Dutch Law have had a far-reaching impact on African customary law.[38]

It is clear that there has been a considerable process of mutual interaction of the different legal systems of the world, and it may therefore be possible to deduce certain general principles of law which are recognised by all civilised nations. The alignment of the major legal systems of the world will now be examined in order to determine whether any universally accepted principle of liability for harmful acts can be elucidated.

The Western law of liability for harmful acts, in civil law and common law countries alike, recognises a general obligation not to inflict unlawful harm on one's neighbour. The obligation is based partly on liability for fault, including negligence, and partly on an absolute liability for dangerous things. Sir Frederick Pollock, in his treatise on *The Law of Torts*, observes that the principle accepted by Anglo-American common law is that "it is a wrong to do wilful harm to one's neighbour without lawful justification or excuse."[39] This position was reached in the common law after a long process of development which is analysed by Winfield in his jurisprudential study on *The Province of the Law of Tort*.[40] The principle of general responsibility for unlawful harm to one's neighbour is also recognised by France in Article 1382 of the *Code Napolean* and by Italy in Article 2043 of the *Italian Civil Code*. The same principle is adopted in Germany in Sections 823 and 826 of the *German Civil*

36. Refer Gledhill, *Reception of English Law in India*, (1950).

37. Refer J.E. de Becker, *Elements of Japanese Law* (1916).

38. Refer T.O. Elias *The Nature of African Customary Law*, (1956), especially Ch. XIII, 'The Impact of English Law on African Law', pp. 273-292. Refer also Julius Lewin, *Studies in African Native Law* (1946) & T.O. Elias, *Ground-work of Nigerian Law* (1954).

39. F. Pollock., *The Law of Torts* (1926), p. 20.

40. P.H. Winfield; *The Province of the Law of Torts* (1931).

Code,[41] and the *Swiss Code des Obligations* incorporates the same principle in Article 41.[42] This principle also appears to be fully accepted in the Soviet Union in Article 403 of the *Soviet Code*.[43] It may be said, therefore, that the major legal systems of Europe recognise a general obligation not to inflict unlawful harm on one's neighbour. In general, the law of liability for unlawful harm, in the countries of Europe, is based on the principle of fault, which is inherited from the conception of *dolus* and *culpa* in Roman Law, but the principle of fault has in recent times been qualified in some form by giving the principle of absolute liability in respect of dangers created by the respondent a substantially wider application than was known to Roman law.[44] Thus in English law there is the rule in *Rylands v. Fletcher* which lays down that :

> The person who for his own purposes brings on his land and collects and keeps there anything likely to do mischief if it escapes must keep it in at his peril, and, if he does not do so, is *prima facie* answerable for all the damage which is the natural consequence of its escape.[45]

In American law, there is the principle of liability for ultra-hazardous activities, which has been stated thus:

> One who carried on an ultra-hazardous activity is liable to another whose person, land or chattels the actor should recognise as likely to be harmed by the unpreventable miscarriage of the activity for harm resulting thereto from that which makes the activity ultra-hazardous, although the utmost care is exercised to prevent the harm.[46]

In French law, there is the *theorie du risque cree*[74] and in German

41. Refer *Manual of German Law* (1950), United Kingdom Foreign Office Vol. I, pp. 100-108

42. Refer Recueil Systematique des Lois et Ordonnances; 1847-1947, p. 41.

43. Refer Gsovski, *Soviet Civil Code* (1948), Vol. 1, pp. 488-90.

44. For an analysis of the development of the theory of absolute liability in the common law, refer Buckland & Mc Nair, *Roman Law & Common Law* (1936), particularly pp. 313-14; with regard to the civil law refer: F.H. Lawson, *Negligence in the Civil Law* (1950).

45. L.R. 3 H.L. 330; refer Winfield, *Law of Torts* (1954) pp. 584-614.

46. American Law Institute, *Restatement of the Law of Torts* (1938), Vol. 3, pp. 41-53.

47. For an analysis of the *theorie du risque cree* refer Planiol, Traite elementaire du droit civil, 3rd ed. by Ripert, 1949, Vol. 2. pp. 315-17.

law, there is the principle of responsibility for risks.[48] The principle of absolute liability for dangerous things has therefore been accepted by the major legal systems of Europe and America.

Let us now turn to the legal systems of Asia and Africa. With the exception of the legal systems which, like Hindu law and Mohammedan law as applied in India, now operate only as personal laws and have no contemporary application to matters of tort, all the major legal systems of these two continents, such as Islamic law, traditional Chinese law, Japanese law and African customary law, are confronted with the problems of the relationship of fault, negligence and absolute liability which are among the most difficult and rapidly developing branches of law in these regions. In traditional Islamic law, there does not appear to be a clear distinction between tort and crime as understood in western legal systems. The Syrian jurist, Riyad Maydani, has observed that "no other parts of the *Sharia* are as inadequately worked out by Muslim jurists as the law of *uqubat*, which covers both tort and crime as understood in the common law.[49] On this question, Riyad Maydani draws the following distinction:

> The term *uqubat* (singular, *uquba*) covers the two kinds of wrongs, namely torts and crimes. But the line dividing the two is sometimes very narrow since the rights of the public and of individuals are often combined. One of the tests is to determine to whom the law grants the remedy, to the public or to the individual. In the latter case, the wrong would be a tort, in the former case, a crime.[50]

Louis Milliot, in his *Introduction al etude du droit musulman* expresses the view that the elements of the common law distinction between tort and crime exist in Islamic law in distinctions between rights of action vested in men, rights of action vested in Allah and mixed rights of action, but all of these rights operate within the framework of a general law of transgressions in which religious

48. Refer U.K. Foreign Office, *Manual of German Law*, (1950), Vol. I, pp. 108-110.

49. For an exposition of the general principles of the Law of 'uqubat' refer Riyad Maydani, "*Uqubat Penal Law*", *Law in the Middle East* (1955), pp. 223-35.

50. *Ibid.*, p. 223.

offences, civil liability and criminal responsibility are intermingled." [51] The nearest approach in Islamic law to a law of tort is to be found in the *Majalla*, the Ottoman codification of the *Sharia* law of the *Hanafi* school, which although superseded in Turkey in 1926 by the Swiss Codes, is still in force to varying extents in some of the successor States of the Ottoman Empire. [52] Although the *Majalla* was a product of the Ottoman reform movement of the latter half of the nineteenth century, it was based on the *Hanafi* school of law and was one of the important means of preserving Islamic institutions while the Ottoman Empire was changing from an Islamic to Western society. It did not introduce new principles of law but codified the Islamic principles which had served as the civil law of the Ottoman Empire. Its very name indicates this fact, for the word *Majalla* means a digest of legal rules and principles. The full name of the code is *Majallat-i-Ahkami Adliye*, the Book of the Rules of Justice. [53] The various parts of the *Majalla* were published and put into effect over a period of several years; the first part was published in 1870 and the sixteenth and last in 1877. The *Majalla* had the force of law and was applied as the civil code of the Ottoman Empire. It consisted of an introductory section and sixteen books, each treating a different subject.

The theory of objective responsibility or risk is set forth in several of the preliminary articles "Disadvantage is an obligation accompanying enjoyment" (Article 87), and "the burden is in proportion to the benefit, and the benefit to the burden" (Article 88). It follows that if a situation creates a benefit for a person, that person should also be responsible for the risk involved, i.e. a businessman or factory owner should be responsible for the harm he causes to other persons even if he is not at fault. In European law, responsibility is based largely on the principle of negligence, which has been so striking a feature of the development of both the common law and the civil law. If damage is not due to a person's negligence, he is generally not liable for compensation; objective responsibility is only applied in exceptional cases where there is an absolute liability

51. Refer Louis Milliot, '*Introduction al' etude du droit Musulman*' (1953) pp. 207-212 and 744-750. This book is an excellent introduction to the principles of Islamic law.

52. For an account of the organisation and basic principles of the *Majalla* refer S.S. Onar "*The Majalla*", *Law in the Middle East* (1955) pp. 292-308.

53. For an English translation of the *Majalla*, refer C.A. Hooper, *Civil Law of Palestine and Transjordan*, (1953), Vol. I.

in respect of dangers created by the respondent. In the *Majalla*, by contrast, objective responsibility is an essential principle. [54] Where destruction of property is concerned, the *Majalla* makes the destroyer responsible for the damage, irrespective of intention or negligence (Article 912). Consequently, a person who destroys another's property by accident is held liable to pay compensation (Article 916). Intent or negligence is not considered and the liability is based exclusively upon the result of the action. It is a fundamental legal principle of Islamic law that when a person exercises a right which belongs to him, he exercises a right which has been permitted to him by law. Therefore, when a person exercises his right within its legal bounds, this permission releases him in principle from all consequences with regard to others that may arise thereon. This is the meaning of the rule adopted in Article 91 of the *Majalla*, "legal permissibility negates liability". Thus it is a basic principle that the exercise of a right does not in itself entail liability. However, if the exercise of a right causes injury to others, it can give rise to liability. In the opinion of the *Hanafi* jurists, the exercise of a right is to be prohibited if it should cause serious injury. This principle was adopted in Article 1197 of the *Majalla* which provides that :

> No person may be prevented from doing as he wishes with his peoperty unless in so doing he should cause grave damage to other persons.

This approach, therefore, focuses upon the result rather than upon the intention of the person exercising the right. If the result is fraught with grave danger, the exercise of the right is prohibited regardless of the intention. [55] It may be said, therefore, that Islamic law, as codified in the *Majalla*, recognises a general obligation not to inflict harm on one's neighbour and imposes an absolute liability in cases of damage done directly to the person or property of another. The principle, that injurious exercise of rights is prohibited, enunciated in Article 1197 of the *Majalla*, is very similar to the modern principle of the prohibition of the abuse of rights. Article 226 of the *German Civil Code*, for instance, provides that :

> The exercise of a right is forbidden if it can have no other purpose than to harm some other person.

54. S.S. Onar, 'The Majalla', *Law in the Middle East* (1955), p. 297.

55. Subhi Mahmasani, 'Transactions in the *Sharia*', *Law in the Middle East* (1955), pp. 186-87: Exercise of Rights.

Similarly, Article 2 of the *Swiss Civil Code* provides that :

> Every person is bound to exercise his rights and to fulfil his obligations according to the principles of good faith. The law does not protect the manifest abuse of a right.

The *French Civil Code* also provides in Article 544 that :

> Ownership is the right of enjoying and disposing of a thing in the most unlimited manner provided that it is not utilised in a manner forbidden by law.[56]

The basis of liability in African customary law appears to be causation rather than culpability, but modern writers on African law, such as T.O. Elias, argue that "fault, negligence and absolute liability are all elements in a concept of liability in African customary law which is perhaps not fully self-conscious of all its constituent elements but does not diverge widely in its essentials from the accepted concepts of the common law."[57]. The concept of responsibility in traditional Chinese law appears to be based on the principle of "what has happened" rather than "who has done something" [58], but there appears to be absolute liability in such cases.[59] Japanese Civil Law, which is based to a large extent on the *German Civil Code*, accepts the principle of liability for fault, including negligence and the principle of absolute liability for dangerous things.[60] The Indian law also accepts these principles as it is based largely on English common law. The principle of absolute liability has, however, been rather sparingly accepted in Roman-Dutch law as applied in Ceylon, because the principle did not form part of the traditional Roman-Dutch law, which is based on Roman, but was subsequently infused into Roman-Dutch law as applied in Ceylon through the influence of English law.[61]

It may be said, therefore, that in respect of the fundamentals of the law of tortious liability there is a substantial body of agreed principles common to all the major legal systems of the world

56. For a comparative study of the application of the theory of the abuse of rights in French, German, and Swiss laws refer H.C. Gutteridge, 'Abuse of Rights' 5 *Cambridge Law Journal* 22 (1933), pp. 32-39.
57. T.O. Elias, *The Nature of African Customary Law*, (1956), pp. 155-61; refer also Julius Lewin, *Studies in African Native Law*, (1947).
58. Owen Latimore, *Manchuria, Cradle of Conflict* (1932), p. 80.
59. Refer Jean Escarra, Le droit chinois (1936), pp. 77-78.
60. J.E. de Becker *Elements of Japanese Law* (1916). p. 245.
61. Refer R.W. Lee, *Introduction to Roman-Dutch Law*, (1931), pp, 333-34.

on which a universal system of international law can draw in developing and elaborating its own rules and principles with regard to international torts and tortious liability. The major legal systems of Europe, America, Asia and Africa recognise in some form a general obligation not to inflict unlawful harm on one's neighbour. This principle is recognised by the legal systems of Europe and America and is also recognised by the legal systems of Asia and Africa which have been profoundly influenced in matters of tort by the common law and the civil law. The principle that one must not do unlawful harm to one's neighbours is also recognised by Islamic law as codified in the *Majalla*. The principle of absolute liability for dangerous substances or things is recognised in some form by all the legal systems of the world. In English law, there is the rule in *Rylands* v *Fletcher*; in American law, there is the principle of liability for ultra-hazardous activities; in French law, there is the *theorie du risque cree*; and in German law, there is the principle of responsibility for risks. The theory of objective responsibility or risk is recognised by Islamic law as codified in the *Majalla* and the principle of absolute liability for dangerous things also forms part of the civil law of India and Japan. It may be said, therefore, that the major legal systems of the world recognise a general obligation not to inflict unlawful harm on one's neighbour and base this obligation partly on liability for fault and partly on absolute liability for dangerous things. These principles of law recognised by all civilised nations may therefore be regarded as a source of international law and have an important bearing on the future development of international law in the field of international torts and tortious liability. The general principle of law recognised by all nations that 'one must not do unlawful harm to one's neighbours' should be applicable in international law if a universal system of international law is to continue to develop in accordance with modern scientific developments, particularly in the field of nuclear weapons. All systems of municipal law prevent an owner of property from doing acts on his property and dealing with it in a manner dangerous to neighbouring owners. A similar doctrine, based on this universally accepted principle of absolute liability for dangerous things, should be applicable in international law, and a State harbouring dangerous things on its territory or carrying out dangerous experiments within its territory should be liable for damage caused to neighbouring States. A State has no doubt sovereign authority over its own

territory, but it is submitted that in exercising its sovereign rights a State is under an obligation not to perform any acts on its territory which will have harmful effects on neighbouring States. On the basis of the general principle of law recognised by all civilised nations that "all members of a civilised commonwealth are under a general duty towards their neighbours to do them no hurt without lawful cause or excuse," it is submitted that no State should be permitted to use its territory in a manner harmful to neighbouring States. A State, which harbours dangerous things on its territory or carries out dangerous experiments on its territory, which cause damage to neighbouring States, should therefore incur legal responsibility to the other States. It is submitted that this responsibility should extend to every kind of damage whatsoever-biological, metereological economic and otherwise. Such acts would be international torts. The legality of carrying on of nuclear tests in one's own territory, if such tests cause harm outside the territory, will therefore depend on the application of this general principle of law recognised by all nations that "one must not do unlawful harm to one's neighbours." If the rule applies and damage has been caused, the testing State would have committed an international tort and will be responsible to the neighbouring States for the consequences of its illegal action.

The application of the principles of State responsibility and tortious liability to the problem of nuclear tests

The nuclear tests carried out by the United States in the Pacific Ocean and the nuclear tests carried out by the Soviet Union in Central Asia and the Arctic appear to have had harmful effects on neighbouring States. It is for consideration, therefore, whether an international tort was committed by the testing States as a result of the thermo-nuclear experiments and whether there is State responsibility for the damage caused by these tests. It is also for consideration whether the tests carried out by France in the Sahara raise issues of State responsibility as these tests appear to have had harmful effects on the territories of Ghana and the United Arab Republic. Finally, it is for consideration whether the resumption and continuation of nuclear tests by the Soviet Union, the United States, the United Kingdom and France would raise issues of joint liability in tort and whether the States which carry out these tests would be liable as joint tortfeasors in international law.

At the commencement of this Chapter the principles of State

responsibility were examined, and it was shown that for State responsibility to arise there must be an act or omission in violation of international law, that the act or omission must be imputable to a State and result in injury to another State, and that the State which has committed the wrongful act or omission has a duty to make reparation for the injury caused. State responsibility may therefore arise as the result of the commission of an international tort. The breach of any international obligation, whether it rests on *lex inter partes* of a treaty, a rule of international customary law or a general principle of law recognised by civilised nations, constitutes an international tort, which has been defined as "an unjustified, unpardoned, imputable and voluntary breach of an international obligation."[62] The principles of State responsibility and tortious liability may now be applied to determine whether an international tort was committed by the testing States as a result of the nuclear tests carried out in the Pacific Ocean and in Soviet Asia.

It is for consideration, therefore, whether there was an act in violation of international law and whether this act was directly responsible for the damage caused. It is submitted that the nuclear tests carried out in the Pacific Ocean violated international law because the tests interfered with the freedom of the seas. It is a universally accepted rule of international law that no State has the right to interfere with any of the four freedoms of the high seas, namely, freedom of navigation, freedom of fishing, freedom to lay submarine cables and pipelines, and freedom to fly over the high seas. The evidence collected in Chapter I has shown that the nuclear tests interfered with freedom of navigation, freedom of fishing and freedom of flying and thus violated universally accepted rules of customary international law. The closing of vast areas of the Pacific Ocean to shipping and aircraft cannot be reconciled with freedom of navigation on the high seas and in the air space above the high seas. No police power can be found to justify fencing off from the maritime and air traffic of other nations hundreds of thousands of square miles of open sea and air space. When the testing State declared hundreds of thousands of square miles of the open sea as a 'prohibited area' it, in effect reserved that vast area of the high seas for its own and exclusive use; it in effect appropriated the area and exercised dominion over it. In other words, it subjected a part of the high seas

62. Schwarzenberger, *International Law*, 1957, Vol. I, p. 632.

to its sovereignty; navigation, fishing, flying over the high seas—indeed, all the freedoms of the open seas—became impossible in that area. The rule of prohibition of exercise of sovereignty or jurisdiction in any part of the open sea was, therefore, infringed and the four freedoms belonging to other States were interfered with. It is of the essence of the freedom of the seas that the rights of all States are common; the sea must remain common and open to all nations, and no given State is entitled to proscribe its use to other States.

The nuclear tests carried out in the Marshall Islands interfered not only with freedom of navigation but also with freedom of fishing in the Pacific Ocean. In Chapter I it was shown that the contamination of the water and fish of the Pacific Ocean as a result of the nuclear tests seriously impaired and interrupted the right of Japanese fishermen to fish on the high seas and had harmful effects on the fishing industry of Japan. It is a fundamental principle of international law that all States have the right for their nationals to engage in fishing on the high seas and no State may be prevented from exercising this right to fish on the high seas in time of peace. It is submitted, therefore, that the contamination of the fish in the Pacific Ocean and the consequent hardship caused to the fishing industry in Japan is a clear violation of the fundamental right of fisheries on the high seas. The nuclear tests in the Pacific therefore interfered with freedom of navigation and freedom of fishing and violated universally accepted rules of customary international law. It is established beyond doubt that the interference with freedom of navigation and freedom of fishing and the damage to the fishing industry of Japan were caused by the nuclear tests carried out in the Marshall Islands and the carrying out of these tests were voluntary acts performed by the armed forces of the testing States, which would come under the category of an executive organ of the State. These acts were directly responsible for the damage caused to the nationals of Japan and to Japan's fishing industry. In Japan, in 1954, the fish, the rain, the drinking water, the vegetables, the dust on roofs and in houses all became radioactive; they were made so by the nuclear tests carried out in the Marshall Islands. It is clear therefore that there was an act in violation of international law which was imputable to a State and that this act resulted in damage to another State. As all these requisites are present, there would appear to be a clear commission of an international tort, and the testing State is therefore

legally responsible to Japan for the consequences of its illegal action.

It is submitted, therefore, that an international tort was committed as a result of the thermonuclear experiments in the Pacific Ocean and that there is State responsibility for the damage caused by these tests. On the basis of these principles, it is also submitted that the carrying out of nuclear tests by the Soviet Union may amount to the commission of an international tort. In Chapter I it was noted that the nuclear tests recently carried out by the Soviet Union in Central Asia and the Arctic have resulted in radioactive fall-out on Japan, India and other neighbouring States. It is submitted, therefore, that if the harmful effects of these tests can be proved by scientific evidence, there would appear to be a clear commission of an international tort by the Soviet Union. The principles of tortious liability in the case of such an international tort may be based on the principle of absolute liability for dangerous substances or things which is universally recognised as a general principle of law by all civilised nations. The liability in such a case must be regarded as absolute liability in accordance with the principles laid down in such cases, such as *Rylands v. Fletcher*, in which Blackburn J. enunciated the classical exposition of the doctrine in the following words :

> A person who for his own purposes brings on his land and collects and keeps there anything likely to do mischief if it escapes, must keep it in at his peril, and, if he does not do so, is *prima facie* answerable for all the damage which is the natural consequence of its escape.[63]

The equivalent of this case in international law is the *Trail Smelter Arbitration* between the United States and Canada in which the Tribunal held Canada liable on the ground that

> Under the principles of international law, as well as the law of the United States, no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence.[64]

63. Winfield: *Textbook of the Law of Tort*, p. 585.
64. Annual Digest, 1938-40 Case No. 104.

The Tribunal clearly regarded the general principle of the duty of a State to protect other States from injurious acts from within its jurisdiction, which it traced back to the *Alabama Claims Arbitration*,[65] as of wider application. It is submitted that injury caused by atomic raidation as a result of nuclear tests is as much a ground of liability as injury caused by noxious fumes and that on the basis of this principle the testing State would appear to have committed an abuse of rights by availing itself of its rights "in an arbitrary manner in such a way as to inflict injury upon another State."[66] State responsibility therefore arises as a result of this abuse of rights enjoyed by virtue of international law and the State which has committed the wrongful act has a duty to make reparation for the injury caused.

The Government of the United States took prompt action after the Pacific tests in 1954 and tendered the sum of two million dollars to the Government of Japan, but it offered this sum of money to the Government of Japan *ex gratia* and 'without any reference to the question of legal liability.' The Government of Japan accepted the sum of two million dollars "in full settlement of any and all claims against the United States or its agents, nationals or juridical entities." It is submitted, however, that the payment of compensation does not finally settle the question if the State concerned continues testing such weapons as in the case of the United States which resumed its test series in the Pacific in 1962. If the carrying out of such tests amounts to the commission of an international tort, no further tests should be carried out. Although no international tribunal has given a judgment on the question of whether a State may continue to persist in a conduct for which it is liable for damages, and although the question may be in doubt until the matter is clarified by at least an advisory opinion of the International Court, it is apparent that no State would regard payment of compensation each time a nuclear test takes place as an equitable solution to the problems arising from the damage caused by such explosions. In the *Trail Smelter Arbitration*, the United States contended that "a State may not continue activity which inflicts compensable injury."[67] If the carrying out of nuclear tests amounts to an illegal act, the payment

65. Moore, *History & Digest of International Arbitrations*, 1898, pp. 495-682.

66. Refer commencement of this Chapter for an analysis of the principles underlying the theory of abuse of rights in international law.

67. 3, United Nations Reports of International Awards, p. 1965.

of compensation would not legalise or justify the constant commission of the illegal act. If the carrying out of such tests amounts to the commission of an international tort, no further tests should be carried out. If further tests are carried out with resulting damage, the question will arise as to what remedy is available to the States which have suffered damage. The typical remedy for tort is unliquidated damages. Is such a remedy feasible and appropriate in the type of case under consideration? Would something in the nature of a mandatory injunction prohibiting such tests be a more appropriate remedy? If so, could such an injunction be issued by the International Court of Justice if the matter is referred to the Court by a State or group of States? If nuclear tests continue unabated, these are some of the questions which the States affected by radioactivity will have to consider. The difficulties of the matter must not be, and are not likely to be, underestimated. What relative importance should be attached, in the development of a workable body of law on the subject, to the principles of fault and absolute liability respectively? What degree of responsibility could be imputed to the testing State for the damage caused to the neighbouring States? At what point would the principle of remoteness of damage become applicable? These are some of the questions which will have to be considered if the necessary legal action is to be taken to prohibit the carrying out of nuclear tests. The danger is not that these difficulties will be overlooked or underestimated, that they will be regarded as so appalling that they may discourage any attempt to move along constructive lines.

Nuclear tests and the United Nations Charter

It is a matter for consideration, whether it is lawful for a trustee authority to use territories, which it holds on trust from the United Nations, for the purposes of holding nuclear tests.[68] The United States has in the past used the trusteeship territory of the Marshall Islands as the main site for the testing of nuclear weapons and the injuries and hardship caused to the Marshall Islanders by these tests have been described in Chapter I of this Report.[69] It is for consideration, therefore, whether the conduct of nuclear tests in trust territory is a violation of the United Nations Charter and the Trusteeship Agreement. The chapters of the United

68. Refer Chapter I of this Report.

69. *Ibid.*

Nations Charter dealing with non-self-governing territories and the international trusteeship system are not easily reconciled with conducting hazardous nuclear experiments in the Marshall Islands. Article 73 of the Charter of the United Nations states that :

> Members of the United Nations which have or assume responsibilities for the administration of territories whose peoples have not yet attained a full measure of self-government, recognise the principle that the interests of the inhabitants of these territories are paramount, and *accept as a sacred trust, the obligation to promote to the utmost*, within the system of international peace and security established by this Charter, the well-being of the inhabitants of these territories.

Article 74 states that :

> Members of the United Nations also agree that their policy in respect of the territories to which the Charter applies, no less than in respect of their metropolitan areas, must be based on the *general principle of good-neighbourliness*, due account being taken of the interests and well-being of the rest of the world, in social, economic and commercial matters.

Article 6 of the Trusteeship Agreement describes even more specifically the responsibilities of the United States as an administering authority. Article 6(2) states that the administering authority must promote the "economic advancement and self-sufficiency of the inhabitants" by encouraging "the development of fisheries, agriculture and industries" and by protecting the inhabitants against the "loss of their lands and resources." Article 6(3) requires the administering authority to "protect the health of the inhabitants." The removal of the inhabitants of the islands of Bikini, Eniwetok, Rongelap and Uterik from their homes for the purpose of carrying out nuclear tests and the consequent injury to the health and well-being of the inhabitants of the Marshall Islands due to the effects of the nuclear tests, appear to be a clear violation of the above treaty obligations assumed by the United States.[70] The removal of the inhabitants of the islands in the so-called "danger zones" amounts to removing them from their land and homes and this is a violation of Article 73 of the Charter and Article 6 of the Trusteeship Agreement. The 137 inhabitants of the

70 Refer Chapter I of this Report for the effects of the nuclear tests on the Marshall Islanders.

island of Eniwetok were removed from their land and homes and settled on the island of Ujelong. The 167 inhabitants of Bikini Atoll were similarly removed from their land and homes and settled on the island of Kili. Bikini and Eniwetok, where the hydrogen bombs were exploded, will almost certainly never again be inhabitable by these islanders, who have therefore been permanently exiled from their land and homes by the trustee authority. The mission from the United Nations Trusteeship Council which visited the Marshall Islands in 1956 reported that the 167 inhabitants of Bikini Atoll who had been evacuated to the island of Kili, in the southernmost part of the Marshall Islands group, were experiencing great hardship as they had been deprived of the extensive lagoons abundant with fish around Bikini Atoll on which they had depended for their livelihood and food. The deprivation of the people of Bikini of their fishing grounds and the placing of these unfortunate people on the island of Kili, which does not possess lagoons abundant with fish as around Bikini, appears to be contrary to the requirements of Article 6 of the Trusteeship Agreement which provides that the administering authority should promote the economic advancement and self-sufficiency of the inhabitants by encouraging the development of fisheries and by protecting the inhabitants against loss of their natural resources.

Apart from the economic hardship caused by the removal of the islanders from their homes, the inhabitants of the islands of Rongelap and Uterik suffered injury as a result of the radioactive fall-out from the nuclear tests and developed radiation sickness. All the children of these islands who were irradiated appear to be an year behind in height and weight and a United Nations mission which visited the islands at the beginning of this year has reported that the people of Rongelap have not yet fully recovered from the effects of the tests and appear to be still seized by fear and anxiety lest the series be resumed. Article 73 of the United Nations Charter requires that in administering trust territories the trustee authority must ensure the just treatment of the people of the trust territory and protect them against abuses. It is submitted that it is very unjust and indeed a manifest abuse to explode hydrogen bombs in a trustee territory and subject the people there to the hazards of atomic radiation. Under Article 73 of the Charter the administering State has accepted as a sacred trust the obligation to promote to the utmost the

well-being of the inhabitants of these territories. The explosion of hydrogen bombs on the territory can hardly be said to be promoting the well-being of the inhabitants of the territory. On the contrary, it has in fact retarded the development of the children of the territory and subjected a large number of the people to atomic radiation and radiation sickness. It is submitted therefore that by carrying out harmful nuclear tests in the trust territory, the administering authority has violated the provisions of the Charter and committed an illegal act. It is submitted, further, that although a State may be said to have a certain measure of sovereignty over a colonial territory, the administering authority of a trust territory does not have sovereignty over such territory as it is merely looking after the territory as a trustee under the supervision of the United Nations. It is therefore not entitled to exercise any sovereign rights over the territory and does not have the right to carry out nuclear tests which harm the people of the territory. It is submitted therefore that the carrying out of dangerous nuclear tests in a trust territory is contrary to the basic principles of trusteeship and constitutes an arrogation of sovereign rights which the administering authority does not possess.

It is for consideration whether the carrying out of nuclear tests with its consequent hazards to the health of the peoples of the world amounts to a violation of fundamental human rights in the context of the United Nations Charter and the Universal Declaration of Human Rights. The preamble to the United Nations Charter reaffirms the faith of the peoples of the United Nations in fundamental human rights and the dignity and worth of the human person. The Statement of Purposes of the United Nations includes international cooperation in promoting and encouraging respect for human rights and fundamental freedoms. Lauterpacht in his treatise *International Law and Human Rights* expresses the view that it would be wholly inaccurate to conclude that the provisions in the Charter relating to human rights are mere declarations or principles devoid of any element of legal obligation. Any such conclusion is, in the opinion of the learned author, no more than a facile generalisation. The provisions of the Charter on the subject figure prominently in the Statement of Purposes of the United Nations and Members of the United Nations are, in the opinion of the author, under a legal obligation to act in accordance with these purposes. It is their legal duty to respect and observe fundamental human rights and freedoms.

Nuclear tests constitute a hazard to the human race. Even if the tests are carried out within the territory of the testing State, as in the case of the Soviet tests, and even if such tests may endanger immediately only the lives and health of the people of the testing State, the carrying out of such tests may still amount to a violation of fundamental human rights, as in the context of the U. N. Charter the welfare of the people of all States, including the Soviet State, is the common concern of the United Nations and the peoples of the world. Eventually the whole of human life on the globe may be affected by nuclear tests, such as the 50-megaton bomb explosion in the Soviet Arctic, and it is clear that these tests in the eastern regions of the Soviet Union have resulted in the fall of radioactive rain on neighbouring countries, such as Japan and India. The carrying out of such tests amounts to a wanton disregard for the welfare and safety of human race. It is submitted that the holding of such tests in gross disregard of the consequences to human life is illegal and is in violation of the principles of the Universal Declaration of Human Rights and the provisions of the United Nations Charter with regard to fundamental human rights and freedoms. It is to be hoped that the dictates of humanity and of public conscience, invoked by the Universal Declaration of Human Rights, will carry weight also in the realm of nuclear tests and that the humanitarian codes of international law will soon comprise the prohibition of nuclear tests.

It is also a matter for consideration whether nuclear tests may be carried out in colonial or non-self-governing territories, such as the African Sahara, in which France has carried out atomic tests and proposes to carry out further tests. Article 73 of the United Nations Charter defines non-self-governing territories as territories whose people have not yet attained a full measure of self-government. Such territories are not part of the metropolitan area of a State and a State does not possess the same measure of absolute sovereignty over such non-self-governing territories as it has over its metropolitan territory. This is so because the administering State has the responsibility to guide such territories to full self-government and independence, and therefore the form of sovereignty exercised over such territories may be called "conditional sovereignty", i.e. a sovereignty exercised under certain conditions for the time being until the territory achieves full independence and developes into

a sovereign State of its own. The sovereignty exercised over such territories is threfore merely transitory and is not absolute sovereignty. It is submitted that Articles 73 and 74 of the United Nations Charter give specific rights to non-self-governing territories and that these territories are not under the complete and absolute sovereignty of the metropolitan States. As the members of the United Nations have committed themselves to the observance of certain international standards in their relations with their colonies, it is submitted that they do not have the right to expose the peoples of these dependent territories, as well as the peoples of the neighbouring territories, to harmful radioactive fall-out by carrying out nuclear tests in such territories. In Chapter I it was shown that the nuclear tests carried out by France in the Sahara have resulted in radioactive fall-out in the neighbouring States of Ghana and the United Arab Republic. It is submitted, therefore, that if the harmful effects of these tests can be proved by scientific evidence, there would appear to be a clear commission of an international tort by France. France has carried out these four nuclear tests in defiance of a Resolution adopted by the General Assembly of the United Nations on 23 November 1959 which reads as follows :

The General Assembly,

Recognising the anxiety caused by the contemplated tests in the Sahara among all peoples, and more particularly those of Africa :

1. Expresses its grave concern over the intention of the Government of France to conduct nuclear tests.
2. Requests France to refrain from such tests.

In carrying out these tests, France not only flouted a resolution of the General Assembly of the United Nations but also ignored the agreement between the United States, Russia and Britain to suspend nuclear tests during the Geneva test-ban negotiations. It is estimated that over three hundred atmospheric or surface tests have so far been carried out in various parts of the world. Each nuclear test has added its quota of radioactive material to the land, the sea and the air, and the scientific evidence collected and set out in Chapter I of this Report has shown that the general contamination of the world by radioactive substances is already having harmful biological and genetic effects on the human race.[71] The indefinite

71. Refer 'Effects of Atomic Radiation', Chapter I.

continuation of nuclear tests will result in an increasingly dangerous pollution of the atmosphere, land and water all over the world and may seriously affect the life and health of the populations of all countries. If the nuclear powers persist in testing nuclear weapons, the States which do not indulge in these tests will have to consider the question as to whether the testing States are liable as joint tort-feasors in international law for the damage caused by these tests. Even if the tests are carried out within the territory of the testing States as in the case of the Soviet tests, and even if the tests do not cause any immediate damage to neighbouring States, every atmospheric test carried out will still have harmful effects on the rest of the world by adding its quota of harmful radioactive substances to the air, the land and the sea. This is so because every atmospheric or surface test results in the radioactive fission products being drawn into the stratosphere and these fission products gradually spread out over a large part of the world and return ultimately to the earth in the form of rain or snow. The estimates of the time for this return to happen have recently been sharply revised. Whereas in earlier official discussions on fall-out the average length of time which the radioactive particles would spend in the stratosphere was reckoned at 10 years, the actual time is now estimated by scientists to be 2 to 3 years. Consequently, the radioactive materials from the over three hundred atmospheric tests, carried out by the Soviet Union, the United States, Britain and France have already returned to the earth with their dangerous radioactive pollution. The Russian, American, British and French tests of nuclear weapons have already distributed sufficient extra radio-activity over the world to be detectable in all our bodies. No living thing can escape. Every nuclear test spreads an additional quota of radioactive elements over every part of the world and each added amount of radiation causes damage to the health of human beings all over the world. It is for consideration, therefore, whether the States which carry out these dangerous experiments with nuclear weapons may be liable as joint tortfeasors in international law. Governments accused of such world-wide contamination and injury to the life and health of peoples of the world are naturally reluctant to face the issue squarely, but now that it has been proved that nuclear tests do result in world-wide contamination, the issue can no longer be evaded. International morality demands and international law requires the immediate cessation of nuclear tests.

CHAPTER III

Nuclear tests and the Freedom of the Seas
Two opposing views

The compatibility of nuclear tests on the high seas in time of peace with the principle of the freedom of the seas has been the subject of considerable controversy among international lawyers. There appear to be two opposing views on this vital question. On the one hand, it is argued by writers such as Jenks[1], Margolis[2], and Shigerdi Oda[3], that nuclear tests are incompatible with the principle of the freedom of the seas and its corollaries of freedom of navigation and freedom of fishing. The American writer, Margolis is of the opinion that "the establishment of a 400,000 square mile warning area" by the United States in the Pacific during the Marshall Island tests "cannot be reconciled with freedom of navigation on the high seas and in the air space above the seas." He is also of the view that "the interference with the interests of other nations in fishing on the high seas caused by the hydrogen bomb tests" is a violation of the international law rule of freedom of fisheries" and "incurs the responsibility of the United States for resulting damage." The English jurist, Jenks, is of the opinion that "in the case of tests on the high seas in time of peace it appears reasonable to postulate a legal obligation to give advance warning of any future tests" and concludes that "where injury to the person or property of nationals of other States arises directly from such tests and there has been no unreasonable disregard of a proper warning, liability for such injury must be regarded as a legal obligation."

On the other hand, it is argued, by Myres S. McDougal,[4] the American jurist, that "the extent to which the bomb tests have actually interfered with commercial navigation, in spite of the size of the area affected, is virtually nil" and "furthermore, the amount of interference with fishing caused by the existence of the warning

1. Jenks, *The Common Law of Mankind*, 1958, pp. 360-62.
2. Margolis: "The Hydrogen Bomb Experiments & International Law," *Yale Law Journal*, April 1955, pp. 627-47.
3. Shigerdi Oda, Die Friedensworte, 53, 1956, pp. 126-35.
4. *Studies in World Public Order*, (1960), pp. 763-843. " The Hydrogen Bomb Tests in Perspective: Lawful Measures for Security," Myres S. McDougal & Robert A. Schlei. Refer also *The Public Order of the Oceans: A Contemporary International Law of the Sea* (1962), pp. 761-72, Myres S. McDougal and William T. Burke.

zones appear to have been slight." In the view of this writer, nuclear tests are not incompatible with the principle of the freedom of the seas but are, in his view, "reasonable measures necessary in the present state of international relations for the protection of international peace and security." In his opinion,

> The only national policy for proponents of human dignity today is to demand, and to demand from a strength which ensures respect, not merely spurious or naive legalisms and not merely freedom for navigation and fishing and the narrowly conceived and unrealistically isolated welfare of a few scattered peoples, but workable prescriptions and institutions for global disarmament.

The object of this Chapter is to examine the question of the compatibility of nuclear tests on the high seas in time of peace with the principle of the freedom of the seas and to ascertain whether such tests interfere with freedom of navigation and freedom of fishing on the high seas and thus violate a fundamental rule of customary international law. In order to achieve this object, it will be necessary to examine the history and recent developments in the law of the sea, with particular reference to the United Nations Conference on the Law of the Sea. The rules of customary and conventional international law applicable to the regime of the high seas will be discussed and these rules will be applied to the given situation in order to determine whether nuclear tests on the high seas interfere with freedom of navigation and freedom of fishing on the open sea.

An examination of the conventions adopted by the United Nations Conference on the Law of the Sea

'International Law had its origin in the attempt to set up some law which would be respected and observed upon the seas, where no nation had the right of dominion and where lay the free highways of the world'.[5] In ancient times navigation on the high seas was free to everybody and the Roman jurist, Ulpian, has described the sea as 'open to everybody by nature.' During the latter part of the Middle Ages, however, the rising maritime nations began to

5. Woodrow Wilson, President of the United States in an Address before the Joint Session of Congress on 2 April 1917; 55 *Congress Records* 103 (1917).

claim sovereignty over extensive areas of the high seas.[6] Portugal claimed sovereignty over the Atlantic and Indian Oceans, Spain over the Pacific Ocean, and the Italian Republic over various parts of the Mediterranean. After the discovery of America and India, Spain and Portugal attempted to enforce their claims by forcibly excluding foreign vessels from the oceans over which they claimed sovereignty. Such exorbitant claims were naturally ignored by rising maritime powers, such as Britain, Holland and France, whose ships forced their way into the Pacific and Indian Oceans in spite of strenuous opposition from Portugal and Spain.[7] The resulting conflict and controversy indirectly influenced the growth of international law. In order to uphold the right of the Dutch to navigation and commerce in the Indian Ocean, the Dutch jurist, Hugo Grotius, wrote in 1609 his famous treatise *Mare Liberum*, in which he contended that the high seas do not form part of the territory of any State as it cannot actually be taken into possession by occupation and that consequently it is by nature free from the sovereignty of any State and belongs equally to all nations.[8] Although Grotius' conception of the freedom of the open sea encountered wide opposition at that time, the growth of maritime communications and international trade in the eighteenth century soon rendered obsolete the medieval theory that States could appropriate vast areas of the high seas to themselves. The principle of the freedom of the high seas was advocated by most writers on international law in the eighteenth century, such as Bynkershoek, Vattel, Martens and Azuni, and by the beginning of the nineteenth century it came to be universally accepted as a rule of international law in both theory and practice.

In the modern times, the principle of the freedom of the open sea implies that the high sea, outside territorial waters, "is not, and never can be, under the sovereignty of any State whatever." Since, therefore, the open sea is not the territory of any State, no State has the right to exercise its legislation, administration, jurisdiction or police over parts of the open sea. Since, further, the open sea can never be under the sovereignty of any State, no State has the right to

6. An analysis of the development of the Law of the Sea during the early period may be found in Hall, *International Law* (1924) pp. 170-180 and in Gidel, De Droit International Public De La Mer (1932), pp. 129-33.

7. Refer Smith, *Law & Custom of the Sea* (1950) pp. 43-44.

8. Grotius' treatise was first translated into English in 1916 and bore the title, "The Freedom of the Seas or the Right Which Belongs to the Dutch to take part in the East Indian Trade."

acquire parts of the open sea through occupation, for, as far as the acquisition of territory is concerned, the open sea is what Roman Law calls *res extra commercium*.[9] The real basis of the doctrine today is to be found in the practical necessity for freedom of communication and commerce between States in which the sea constitutes an international highway. Thus although the open sea is not the territory of any State, it is an object of the Law of Nations. Customary international law contains rules which guarantee a certain legal order on the open sea and important international conventions have been concluded with the object of establishing legal order on the high seas. The four international conventions on the Law of the Sea, adopted by the 1958 United Nations Conference on the Law of the Sea, represent the most comprehensive codification of international law that has been achieved since the Hague Peace Conferences on the Laws of War, and are full of promise for the further progressive development and codification of international law by the United Nations and regional organizations.

The International Law Commission in its Draft Articles presented to the U. N. Conference laid down the fundamental rule of international law that "the high seas being open to all nations, no State may validly purport to subject any part of them to its sovereignty." The Commission laid down, further, that "freedom of the high seas comprises, *inter alia* :

1. Freedom of navigation ;
2. Freedom of fishing ;
3. Freedom to lay submarine cables and pipelines ;
4. Freedom to fly over the high seas." (Article 27).

"Every State has the right to sail ships under its flag on the high seas" (Article 28) and "all States have the right for their nationals to engage in fishing on the high seas" (Article 29). These fundamental principles of the Law of the Sea were incorporated in the conventions adopted by the United Nations Conference on the Law of the Sea.

The second of the four conventions, adopted by the 1958 United Nations Conference on the Law of the Sea, deals with the Regime of the High Seas and is a declaration of the established rules of inter-

9. Oppenheim, *International Law* (1957), Vol. I, p. 589.

national law relating to the high seas. As the object of this Chapter is *to examine the question of the compatibility of nuclear tests on the high seas with the principle of the freedom of the high seas*, it is necessary to examine the relevant provisions of this convention in some detail as the convention is a codification of the established rules of international law relating to the high seas in time of peace.

The convention states by way of definition, in Article 1, that the term "high seas" means all parts of the sea that are not included in the territorial sea or in the internal waters of a State. Article 2 of the convention on the high seas adopts the principles laid down in the Commission's draft and states that "the high seas being open to all nations, no State may validly purport to subject any part of them to its sovereignty. Freedom of the high seas is exercised under the conditions laid down by these articles and by other rules of international law. It comprises, *inter alia*, both for coastal and non-coastal States: (1) Freedom of navigation; (2) Freedom of fishing; (3) Freedom to lay submarine cables and pipe lines; (4) Freedom to fly over the high seas. These freedoms, and others which are recognised by general principles of international law, shall be exercised by all States with reasonable regard to the interests of other States in their exercise of the freedom of the high seas."

Agreement on the last paragraph of this Article was not easily reached because of its bearing on the issue of nuclear tests. Due to the absence of agreement on this issue, the Conference did not incorporate in the convention any express pronouncement on the freedom to undertake nuclear tests on the high seas. It is clear, however, that the principle generally accepted in international law and incorporated in Article 2, namely that the high seas are open to all nations, governs the regulation of the question. As the International Law Commision clearly stated in its Commentary to this Article, 'no state may subject any part of the high seas to its sovereignty' and "*States are bound to refrain from any acts which might adversely affect the use of the high seas by nationals of other States*" it follows from the above Article that the high seas cannot be under the sovereignty of any State and that no State has a right to exercise jurisdiction over any such a stretch of water. The sea must remain common to all nations in order to fulfil its main mission of an international highway.

The convention lays down, in Article 4, the universally accepted rule of international law that "every State, whether coastal or otherwise has the right to sail ships under its flag on the high seas." The convention then goes on to state, in Articles 5 and 6, that each State shall fix the conditions for the grant of its nationality to ships, for the registration of the ships in its territory, and for the right to fly its flag. Nevertheless, for purposes of recognition of the national character of the ship by other States, there must exist genuine link between the State and the ship. In particular, the State must effectively exercise its jurisdiction and control in administrative and technical matters over the ships flying its flag. Ships may sail under the flag of one State only and may not change the flag during a voyage or while in a port of call, save in the case of a real transfer of ownership or change of registry.

These provisions settle another disputed question of modern times, namely the question of the ship's flag, but this matter is not relevant to the question under consideration. What is relevant is the fact that the convention has laid down clearly that every State has the right to sail ships under its flag on the high seas. Freedom of navigation on the high seas is open to the ships of all States and therefore no State is permitted to commit any acts on the high seas which might adversely affect the use of the high seas as a highway by the ships of any other State. It is in the interest of free intercourse and communication between States that the principle of the freedom of the open sea has become universally recognised and will always be upheld.

Under Article 24 of the convention, States are required to "draw up regulations to prevent pollution of the seas by the discharge of oil from ships or pipelines or resulting from the exploitation and exploration of the seabed and its sub-soil" and Article 25 lays down that "every State shall take measures to prevent pollution of the seas from the dumping of radioactive waste, taking into account any standards and regulations which may be formulated by the competent international organisations." States are also required, by Article 25, to "cooperate with the competent international organisations in taking measures for the prevention of pollution of the seas or air space above, resulting from any activities with radioactive materials or other harmful agents."

In the past, concern over the problem of pollution of the high seas has been restricted almost exclusively to pollution from the discharge of oil by ships. A new source of pollution of the sea is the dumping of radio-active waste. The Conference decided that the dumping of radioactive waste, which may be particularly dangerous for fish and fish eaters, should be put on the same footing as pollution by oil. Article 25 accordingly lays down that every State should take measures to prevent pollution of the seas from radioactive waste. The Conference also considered the question of the pollution of the sea or air space above resulting from experiments or activities with radioactive materials or other harmful agents. With regard to this matter, it was finally decided that in view of the many-sidedness of the subject and the difficulties besetting any attempt to impose a general prohibition, the convention should merely provide for an obligation upon States to co-operate in drawing up regulations with a view to obviating the grave dangers involved. Article 25 accordingly provides that all States should co-operate with the competent international organisations in taking measures for the prevention of pollution of the seas or air space above, resulting from any activities or experiments with radioactive materials. It is clear, therefore, that no State should indulge in such activities with radioactive materials because the indulgence in such activity would amount to lack of cooperation with the measures being taken by the international community to prevent pollution of the seas or air space from atomic radiation. Indeed such activity would amount to open defiance and violation of this provision which lays down that all States should cooperate in measures designed to eliminate such dangers.

The Convention lays down, in Articles 26, 27, 28 and 29 that all States are entitled to lay telegraph, telephone, or high-voltage power cables and pipe-lines on the bed of the high seas. Subject to its right to take reasonable measures for the exploration of the continental shelf and the exploitation of its natural resources, the coastal State may not impede the laying or maintenance of such cables or pipe-lines. Due regard must be paid to cables or pipe-lines already in position on the seabed when fresh cables are laid. Every State must pass legislation to provide that the breaking or injury, by a ship flying its flag or by a person subject to its jurisdiction, of a submarine cable, done wilfully or through culpable negligence, shall be

a punishable offence. The legislation must also provide that if persons subject to the State's jurisdiction when laying a cable or pipe-line cause a break or injury to another cable or pipe-line, they should bear the cost of the repairs.

Articles 1, 2, 4 and 24 to 29 are the only provisions of the Convention on the High Seas which are strictly relevant to the subject under consideration. Articles 1, 2 and 4 have a special bearing on the question as they lay down the fundamental principles underlying the law of the sea. The remainder of the articles of this convention deal with the immunity of warships and other government ships, penal jurisdiction in matters of collision, the duty of ships to render assistance, slave trade, piracy and other matters which are not relevant to the question under consideration. The importance of the convention, as a whole, lies in the fact that it is a declaration of the established rules of international law relating to the high seas and is a codification of the customary rules of international law on the subject.

The third convention adopted by the 1958 United Nations Conference on the Law of the Sea is concerned with fishing and the conservation of the living resources of the high seas. The International Law Commission, in its deliberations, became convinced that the claims by various States to a broad territorial sea were evidence not so much of their desire to secure exclusive fishing rights, as of their anxiety to prevent existing fish stocks from becoming exhausted through wasteful and predatory exploitation of fisheries by foreign fishing fleets in adjacent waters. As such, the Commission hoped that it might be able to inhibit the trend towards the extension of territorial sea by making provision for measures whereby fishing in adjacent waters would be subject to some form of regulation or control by the coastal State, without it being necessary to go as far as to designate those waters as part of the State's territorial sea. The relevant rules, submitted to the Conference, were contained in Articles 50 to 59 of the Commission's Draft Articles. The convention adopted by the Conference recognises the special interest of the coastal State in the maintenance of the productivity of fisheries in an area of the high seas adjoining its territorial sea and contains provisions for protecting the living resources of the high seas. The convention also contains elaborate provisions for the peaceful settle-

ment of fishing disputes. A few of the provisions are relevant to the subject under consideration because fishing on the high seas is open to the nationals of all States and nuclear tests carried out on islands in the seas may seriously interfere with the right of fishing on the open sea.

In Article 1, the convention lays down the general principle that all States have the right for their nationals to engage in fishing on the high seas, subject to their treaty obligations and to the provisions contained in this convention regarding the conservation of living resources and the interests and rights of the coastal State. This Article re-affirms the fundamental principle of international law that all States have a right for their nationals to fish on the high seas. The convention requires States to enter into negotiations with a view to laying down by agreement measures necessary for the conservation of the living resources of the high seas and recognises the special interest of coastal State in the maintenance of the productivity of the living resources in the area of the high seas contiguous to its territorial sea. The convention prescribes the procedure to be adopted for the settlement of disputes arising between States and lays down provisions for the regulation of fisheries conducted by means of equipment embedded in the floor of the sea in areas of the high seas adjacent to the territorial sea of a State. The technical details of these provisions are not of direct interest to us, but the general principles underlying the convention are relevant to the subject under consideration. All States have the right for their nationals to engage in fishing on the high seas, and therefore no State may be prevented from exercising this right to fish on the high seas in time of peace. All States must cooperate in measures necessary for the conservation of the living resources of the seas, and therefore no State may carry out any action which might damage or adversely affect the living resources of the sea. Fisheries in the open sea are open to the vessels of all nations and no State may by unilateral action prevent the nationals of other States from enjoying the living resources of the high seas.

The Conference also adopted two other conventions on the Territorial Sea and on the Continental Shelf, but as the provisions of these conventions have no special bearing on the subject under consideration, it is not proposed to deal with them in detail. Both United

Nations Conferences on the Law of the Sea, held in 1958 and 1960, failed to reach any agreement on the controversial question of the breadth of the territorial sea. The 1958 Conference, however, did succeed in drawing up a convention which dealt broadly with most of the other aspects of the territorial sea and with the contiguous zone. This convention, which was adopted by the Conference, deals with the questions of jurisdiction in the territorial sea, the delimitation of the territorial sea (without stating the maximum limit), the right of innocent passage and the question of the contiguous zone. The provisions relating to the contiguous zone may be noted as they may have some bearing on the subject under consideration.

International law accords States the right to exercise preventive or protective control for certain purposes over a belt of the high seas contiguous to their territorial sea. This power of control, however, does not change the legal status of the waters over which it is exercised, which remain a part of the high seas and are not subject to the sovereignty of the coastal State. The coastal State can exercise over the contiguous zone only such rights as are conferred on it by the convention adopted at the Geneva Conference. The convention defines the contiguous zone as a zone of the high seas contiguous to the territorial sea of the coastal State and states that the coastal state may exercise in this zone the control necessary to (a) prevent infringement of its customs, fiscal, immigration or sanitary regulations within its territory or territorial sea, and (b) punish infringement of the above regulations committed within its territory or territorial sea. The convention lays down that the contiguous zone may not extend beyond twelve miles from the base line from which the breadth of the territorial sea is measured.

This recognition of the contiguous zone clears up another disputed question of international law. States have in the past claimed contiguous zones of varying length for different purposes. Now the limit of this zone is fixed at twelve miles and the rights of control are clearly defined. It is significant that the convention does not recognise special security rights in the contiguous zone, nor does the convention recognise any exclusive right of the coastal State to engage in fishing in the contiguous zone. Since the contiguous zone is part of the high seas, however, the rules adopted by the Conference for the conservation of the living resources of the sea would apply to it.

No country is, of course, obliged to claim any contiguous zone and there are still some, such as the United Kingdom, which do not; nor, if it does so, is it obliged to claim the maximum distance permissible. What the above provision makes quite clear is not only that this maximum is twelve miles measured from the coast, or from straight baselines where permissible, but that it includes, and is not additional to, the territorial sea. The legal status of the contiguous zone is also made quite clear. The contiguous zone is not merely a separate and different zone from the territorial sea; it is part of the high seas and its basic juridical status is that of the high seas. It is control and not jurisdiction that may be exercised over the contiguous zone. These rules may have some bearing on the disputed question as to whether States may establish 'danger zones' on the high seas when carrying out nuclear tests. The particular purposes for which a contiguous zone may be established are clearly defined by Article 24 of the convention. Such zone may be established only for the purpose of enforcement of "customs, fiscal, immigration and sanitary regulations." It is significant that the convention does not recognize special security rights in the contiguous zone. Proposals to include 'security rights', successful at the Committee stage, were not adopted at the final plenary stage of the Conference. The International Law Commission had equally rejected such inclusion in its draft, "on the ground that the extreme vagueness of the term 'security' would open the way for abuses", and that "the granting of such rights was not necessary." A State may not, therefore, legitimately establish a contiguous zone merely for reasons of 'security'.

The fourth and last convention adopted by the United Nations Conference deals with the continental shelf, a new conception of maritime law which has become of great importance in recent years since the discovery of vast oil-fields below the bed of the sea at a considerable distance from the shores of the coastal State. The International Law Commission made a detailed study of the question and adopted, at its eighth session, draft articles which formulated the rules of international law relating to the continental shelf. The Commission accepted the principle that the coastal State may exercise control and jurisdiction over the continental shelf, with the proviso that such control and jurisdiction shall be exercised solely for the purpose of exploiting its resources ; and it rejected any claim

to sovereignty or jurisdiction over the superjacent waters. If a right over the waters above the sea-bed of the continental shelf was attributed to the coastal State, that State could appropriate marine areas extending hundreds of miles from the coast. The Commission considered it its duty to reject categorically such an infringement of the principle of the 'mare liberum.' In the words of the Special Rapporteur, J.A.P. Francois,

> "The Commission's draft is based on the principle of recognising the sovereign rights of the coastal State over the continental shelf, for the purposes of exploring and exploiting its natural resources. As a counterpart to this principle the further principle is laid down that rights of the coastal State over the continental shelf do not affect the legal status of superjacent waters as high seas, or that of the air space above those waters. In this manner the Commission thought it could reconcile the interests of the coastal State in the exploitation of the sea-bed and sub-soil of the continental shelf with the interest which the community of States has in preserving the principle of the freedom of the seas."

The principles formulated by the Commission formed the basis of the Convention on the Continental Shelf adopted by the Conference which lays down that "the rights of the coastal State over the continental shelf do not affect the legal status of the superjacent waters as high seas, or that of the air space above these waters." It is expressly laid down that "the exploration of the continental shelf and the exploitation of its natural resources must not result in any unjustifiable interference with navigation, fishing or the conservation of the living resources of the sea." The convention accordingly re-affirms the fundamental principle of the freedom of the high seas for navigation, fishing and flying over the seas for the ships and aircraft of all nations. The articles on the continental shelf are intended as laying down the regime of the continental shelf, only as subject to and within the orbit of the paramount principle of the freedom of the open sea. No modification of or exceptions to that principle are admissible in international law and no State has any right to interfere with the freedom of navigation and freedom of fishing on the high seas. Although 'general' and 'special' police powers over portions of the sea have come to be exercised by States

or groups of States for the repression of piracy, self-defence, hot pursuit, slave trade prohibition, conservation of fisheries and other purposes, the exercise of these rights is subject to and within the orbit of the paramount principle of the freedom of the high seas and its four corollaries which are the fundamental rules governing all relations between States on the high seas. No State has the right to exercise its legislation, administration or jurisdiction over parts of the open sea and all States have the right of navigation and fishing on the high seas. These principles are clearly laid down in the Geneva Conventions on the Law of the Sea which are a declaration of the universally accepted rules of international law relating to the sea.

Problems of international law arising from the testing of nuclear weapons on the high seas

On the basis of the facts set out in Chapter 1 and the principles of international law enunciated in this Chapter it is for consideration whether nuclear tests, if carried out in areas of the high seas, can be said to interfere with the right of navigation and fishing on the high seas and thus violate a fundamental rule of customary international law. Considerable controversy has arisen among international lawyers on the question of the compatibility of nuclear tests on the high seas with the principle of the freedom of the seas. The views of the various writers on this question were briefly stated at commencement of this chapter. Very strong views on this question have been expressed by the American Professors Myres S. McDougal and William T. Burke in their recently published work on the law of the sea, entitled *The Public Order of the Oceans*.[10] In this treatise, the learned Professors have contended that nuclear tests are not incompatible with the principle of the freedom of the seas and have reached the following conclusions :

> "Nuclear weapons testing necessarily displaces free movement in the air and sea for thousands of square miles in the vicinity, and this activity has understandably occasioned much controversy about limits on free navigation. Several States and writers have declared such use impermissible and have advanced in support of these contentions, conceptions of freedom of the seas incorporating absolute prohibitions upon

10. Myres S. McDougal and William T. Burke—*The Public Order of the Oceans: A Contemporary International Law of the Sea*. Yale University Press, 1962.

> any kind of interference with the classical uses of the sea, navigation and fishing. It is scarcely necessary to demonstrate again the manifold inadequacies which attend such misconceptions. It should suffice to note that they are quite unsatisfactory representation of the permissible exclusive authority established by the historic practice of States and ignore completely that the most relevant standard prescribed by customary international law is that of reasonableness. Fair assessment of the relevant factors would indicate to the impartial observer that the exclusive use attendant upon weapons testing fully comports with the reasonableness criterion. For the United States, all such tests have been carried out in parts of the sea far removed from populations of any appreciable magnitude. The test areas selected have offered minimum interference with navigation and flight. No international sea routes are located in the danger zone, and only a slight deviation in flight plan was necessary for the twice-weekly flights across the zone. Japanese fishing operations were affected by United States tests in 1954 but only for a limited period of time. In contrast to these minimal effects upon inclusive use, the interest at stake for the United States is easily seen to be of the greatest significance for its security and for that of a good part of the world. Finally, it is pertinent to note that no practicable alternative was available to the United States for the kind of experimentation that had to be carried out with these devices."[11]

The conclusions reached by McDougal and Burke appear to be based on an interpretation of Article 2 of the Convention on the Regime of the High Seas, adopted by the Geneva Conference on the Law of the Sea in 1958. The American writers allege that "it is not to be inferred that this widespread acceptance of the general doctrine prescribing freedom of access for navigation absolutely prohibits any activity or authority which may interfere with such freedom, [12] and claim that "activities involving exclusive use that temporarily displace free access to non-contiguous areas of the high seas,"[13] are " recognised by the general community

11. *Ibid.*, pp. 771-72
12. *Ibid.*, p. 768
13. *Ibid.*

to be consistent with international law."[14] Such activities are defined as "essentially military in nature"[15] and are said to include "naval manoeuvres and operations and the recent carrying out of nuclear weapons' tests in the sea."[16] In the view of these writers, such activities form an exception to the universally accepted rule of freedom of navigation on the high seas, and it is claimed that "exclusive use" of regions of the high seas for such purposes is "in accord with international law."[17]

It is submitted that these arguments are unsound in law and it is proposed to refute them *seriatim*. The views expressed by McDougal and Burke on the legality of nuclear tests in *The Public Order of the Oceans* are similar to those previously expressed by Myres McDougal in an article entitled "The Hydrogen Bomb Tests and the International Law of the Sea," published in the *American Journal of International Law*.[18] The conclusions drawn by McDougal in this article were strongly criticised by Gilbert Gidel, the eminent French jurist, in an article entitled "Explosions Nucleaires Experimentales et Liberte de la Haute Mer", in which Gidel maintained that nuclear tests on the high seas were incompatible with the principle of the freedom of the open sea.[19] In this article, Gidel very strongly condemned the carrying out of such tests in regions of the high seas and maintained that all such arguments set forth by writers trying to justify the legality of these tests were incorrect. Similar views have been expressed by other writers, such as Georges Fischer,[20] E. Margolis[21] and Shigerdi Oda,[22] who have maintained that such tests are incompatible with the principle of the freedom of the seas and its corollaries of freedom of navigation and freedom of fishing.

14. *Ibid.*
15. *Ibid.*
16. *Ibid.*
17. *Ibid.*, p. 769.
18. "The Hydrogen Bomb Tests & the International Law of the Sea" , 49 *American Journal of International Law*, (1955). Refer also M.S. McDougal and N. A. Schlei, *Studies in World Public Order* (1960) pp. 763-843.
19. "Explosions Nucleaires Experimentales et Liberte de la Haute Mer", *Festschrift fur Jean Spiropoulos*, 173, (1957).
20. *L' Engergie Atomique et les Etats-Unis*, (1957), pp. 366-95.
21. "The Hydrogen Bomb Experiments & International Law", *Yale Law Journal* (April 1955), pp. 629-47.
22. "The Hydrogen Bomb Tests & International Law", 53 *Dis Friedenswarte* (1956), pp. 126-35.

Article 2 of the Geneva Convention on the High Seas states :

"The high seas being open to all nations, no State may validly purport to subject any part of them to its sovereignty. Freedom of the high seas is exercised under the conditions laid down by these articles and by the other rules of international law. It comprises, *inter alia*, both for coastal and non-coastal States :

1. Freedom of navigation ;
2. Freedom of fishing ;
3. Freedom to lay submarine cables and pipelines ;
4. Freedom to fly over the high seas.

These freedoms and others, which are recognised by the general principles of international law, shall be exercised by all States with reasonable regard to the interests of other States in their exercise of the freedom of the high seas."

The Geneva Conference did not incorporate in the Convention on the High Seas any express pronouncement on the question of nuclear tests on the high seas, but it is clear that the principle generally accepted in international law and incorporated in Article 2, namely, that the high seas are open to all nations, governs the regulation of the question. As the International Law Commission clearly stated in paragraph 1 of its Commentary to this Article : "The principle generally accepted in international law, that the high seas are open to all nations, governs the whole regulation of the subject. No State may subject any part of the high seas to its sovereignty ; hence no State may exercise jurisdiction over any such stretch of water. States are bound to refrain from any acts which might adversely affect the use of the high seas by nationals of other States."[23] With regard to the question of nuclear tests, the Commentary states in paragraph 3 that "in this connexion the general principle enunciated in the third sentence of paragraph 1 of this Commentary is applicable."[24] The Commentary also states that " in addition, the Commission draws attention to Article 48, paragraphs 2 and 3, of these Articles."[25] These Articles deal with

23. *Report of the International Law Commission*, 1956, p. 24.
24. Ibid. p. 24.
25. Ibid.

the question of the pollution of the high seas resulting from experiments or activities with radioactive materials or other harmful agents.

It is clear, therefore, that in the opinion of the International Law Commission the general principle that "States are bound to refrain from any acts which might adversely affect the use of the high seas by nationals of other States" is applicable to the question of nuclear tests on the high seas and governs the regulation of the subject. In the book entitled *The Public Order of the Oceans*, McDougal and Burke claim that "although this 'general principle' smacks of absolutism, statements of Commission members and other passages in the Comment seem to make this appearance deceptive."[26] In fact the matter was clarified in the Sixth Committee of the U.N. General Assembly when the subject was raised by the representatives of India, Tunisia, Rumania and Czechoslovakia. In reply to questions raised by these delegates, the Special Rapporteur of the International Law Commission, Mr. J.P.A. Francois, stated that "in point of fact, the Commission had set down the general principle whereby States were required to abstain from all acts which might adversely affect the use of the high seas by nationals of other States" and concluded that "it would be necessary to judge in each particular case whether the testing of nuclear weapons was admissible or not on the basis of that principle."[27] The Commission had, therefore, formulated a general principle on the basis of which such tests were to be judged.

This general principle was included in the Commentary to Article 2 because some Members of the Commission had expressed the view that "freedom of the high seas does not extend to any such utilisation of the high seas as is likely to be harmful to any part of mankind." Introducing a draft proposal to this effect, Dr. Radhabinod Pal said that "the first question to be considered was whether there should be any statement of principle at all" and he agreed with the Special Rapporteur that the Commission should give a ruling one way or the other. He stated that "the Commission could not ignore the fact that in recent years powerful weapons of mass destruction had been invented and tested on the high seas" and said

26. McDougal and Burke, *op. cit.*, p. 761.
27. *Official Records of the General Assembly*, Sixth Committee, Eleventh Session (1956), p. 113.

that "although political considerations were involved some provisions should be inserted in the draft prohibiting the use of the high seas, which were *res communis*, in a manner which might be injurious to mankind."[28] Speaking on this proposal, another Member of the Commission, Mr. Jaroslav Zourek, said that "the Commission must distinguish clearly between scientific experiments and tests of weapons of mass destruction", and maintained that "experiments on the high seas with atomic or hydrogen bombs must be considered as a violation of the principle of the freedom of the high seas." In his view, "the principle stated in the Commentary on Article 2 that 'States are bound to refrain from any acts which might adversely affect the use of the high seas by nationals of other states' was the generally accepted corollary to the freedom of the seas" and there was no necessity to introduce "the concept of reasonableness." In this connection, he stated that "even those who wished to introduce the criterion of reasonableness must admit that if account were taken on the one hand of the interests of native populations, of the rights of all users of the high seas and, with regard to the living resources of the high seas, the rights of all mankind, and on the other hand of the interests of those who carried out experiments with weapons destined to destroy humanity, the answer to the question raised could only be that given by existing international law." In his opinion, "experiments with atomic weapons, unlike naval exercises, could not be controlled" and "in the interests of mankind the real solution was to prohibit all tests of that nature."[29]

The discussions in the International Law Commission, the Draft Articles and Commentaries drawn up by the Commission and the Convention on the High Seas finally adopted by the Geneva Conference accordingly re-affirm the fundamental pricinciple of the freedom of the high seas for navigation, fishing and flying over the seas for aircraft of all nations. No modifications of or exceptions to this principle appear to be accepted by the International Law Commission. Although 'general' and 'special' police powers over portions of the sea have come to be exercised by States or groups of States for the purposes of suppression of piracy, self-defence, naval

28. *Yearbook of the International Law Commission*, 1956, Vol. 1, pp. 11-12.
29. *Ibid.*

exercises, hot pursuit, slave trade prohibition and conservation of fisheries, the exercise of these rights is subject to and within the orbit of the paramount principle of the freedom of the high seas and its four corollaries which are the fundamental rules governing all relations between States on the high seas in time of peace. States have, no doubt, the right to conduct naval exercises on the high seas. These exercises, however, usually last only for a short period in a limited area and they cannot be put on the same footing as nuclear tests which are conducted in vast areas of the ocean for long periods. McDougal and Burke have argued from the analogy of naval exercises that thermonuclear experiments are lawful.[30] It is submitted that this analogy is not sufficiently relevant to sustain their conclusions. No 'police power' or 'historic practice' can be found to justify the fencing off from maritime and air traffic of other nations hundreds of thousands of square miles of open sea and air space. Gunnery practice by naval vessels and the explosion of hydrogen bombs are two quite different activities, and the fact that naval exercises in time of peace are permissible does not justify in any way the carrying out of nuclear tests on the high seas. If nuclear tests on the high seas are "in accord with international law", as argued by McDougal and Burke,[31] all the four Powers which at present possess nuclear weapons would have the right to test them on the high seas, and the open sea will have to be apportioned to the nuclear Powers for the carrying out of nuclear tests. International law would then have to allot experimental zones in different parts of the high seas for experimenting with nuclear weapons. As more and more States come to possess nuclear weapons, millions of square miles of oceans will have to be apportioned between the nuclear Powers and freedom of navigation and fishing on the high seas would have to be abandoned. It is submitted that there is no possibility of any legitimate adjustment between the freedom of the open sea and the claims of individual States to use it for the purpose of nuclear tests. The high seas should remain open for the use of all nations and no State should attempt to subject any part of the open sea to its jurisdiction for the purpose of carrying out nuclear tests. The sea must remain common and open to all nations and States are bound to refrain

30. McDougal and Burke, *op. cit*, pp. 768-72.
31. *Ibid.*, p. 769.

from any acts which might adversely affect the use of the high seas by the nationals of other States.

It is clear that such tests should not be carried out in regions of the high seas as the carrying out of thermonuclear experiments on the high seas results in interference with freedom of fishing on the open sea. It is difficult to agree with McDougal and Burke that such interference is "reasonable" and has only "minimal effects."[32] Vast areas of the high seas have to be patrolled by the testing State to ensure that no fishing vessels enter the prohibited zones and if any vessels inadvertently enter such zones, the vessels and the fishermen may suffer radioactive contamination as in the case of the "Fukuryu Maru." The carrying out of such tests contaminate the waters of the high seas and there is no guarantee that such contamination can be confined to the fish and waters within such zones. The immediate fall-out from such explosions makes the waters intensely radioactive, and this radioactivity may be carried far and wide by ocean currents. The radioactivity also contaminates the fish and plankton in such regions and such radioactive fish may migrate to other regions. Even if the tests are "carried out in parts of the sea far removed from populations of any appreciable magnitude" and even if "no international sea routes are located in the danger zone" as claimed by McDougal and Burke,[33] nuclear tests would still constitute a great danger to all neighbouring countries as the radioactivity may be carried far and wide by the ocean currents. In this respect, too, nuclear tests cannot be placed on the same footing as gunnery exercises as the effects of experiments with nuclear weapons cannot be effectively controlled and confined to the prohibited areas. Such contamination of the waters and fish of the ocean would amount to an interference with freedom of fishing on the high seas. The Convention on Fishing, adopted by Geneva Conference of 1958, lays down that all States have the right for their nationals to engage in fishing on the high seas, and therefore no State may be prevented from exercising this right to fish in any part of the high seas. All States are required to cooperate in measures necessary for the conservation of the living resources of the sea and, therefore, no State may carry out any action which might damage or adversely

32. *Ibid.*, pp. 772.
33. *Ibid.*

affect the living resources of the sea. Fisheries in the open sea are open to the vessels of all nations and no State may by unilateral action prevent the nationals of other States from enjoying the living resources of the sea. In the light of these principles, it is clear that the contamination of the waters and fish of the oceans by nuclear tests would amount to an interference with freedom of fishing on the high seas and no "historic practice of States" such as naval exercises can be put forward to justify the carrying out of such experiments which pollute the high seas with radioactivity.

It is submitted by McDougal and Burke that although "nuclear weapons testing necessarily displaces free movement in the air and sea for thousands of square miles in the vicinity, the test areas selected have offered minimal interference with navigation and flight", and therefore, there has been no infringement of the freedom of the open sea.[34] In contradistinction to this view, it is submitted that no State may validly purport to exercise its jurisdiction or dominion over any part of the high seas. When a testing State declares thousands of square miles of the high seas as a "prohibited area", it in effect reserves that vast area of the high seas for its own and exclusive use, it in effect appropriates the area and exercises dominion over it ; in other words, it subjects a part of the high seas to its jurisdiction or sovereignty. The rule of prohibition of exercise of sovereignty or jurisdiction in any part of the open sea is therefore infringed. The fact that "no international sea routes are located in the danger zone" does not affect the question at all. The right to exercise sovereignty or jurisdiction over the high seas is denied to States by law and such dominion cannot be lawfully exercised over *any* part of the open sea. In the words of Oppenheim,

> "The open sea is not, and never can be, under the sovereignty of any State whatever. Since, therefore, the open sea is not the territory of any State, no State has as a rule a right to exercise its legislation, administration, jurisdiction, or police over parts of the open sea. Since, further, the open sea can never be under the sovereignty of any State, no State has a right to acquire parts of the open sea through occupation for, as far as the acquisition of territory is concerned, the open sea is what Roman law calls *res extra commercium*."[35]

34. *Ibid.*, pp. 771-72.

All areas of the high seas must remain common and open to all nations and no State has the right to exercise dominion over any part of the open sea. Even if no injury to ships or fishermen occurs as a result of nuclear tests, the testing State would still have violated a fundamental rule of international law by closing so vast an area of the open sea. The very nature of nuclear experiments is such that, to the extent that adequate safety measures are taken by cordoning off areas of the high seas, universally accepted rules of customary international law are violated. The alleged humanitarian purpose behind the closing of such vast areas of the high seas loses its justification when it is recalled that the hazard is artificially introduced. The establishment of danger zones is no doubt induced by the desire of the testing State to protect the lives of sailors and fishermen who might be sailing in the surrounding waters, but the debarring of such vessels from so vast an area of the high seas aggravates the legal position as the greater the degree of precaution taken, the larger the prohibited area and the greater the interference with the freedom of the open sea.

In *The Public Order of the Oceans*, McDougal and Burke state that "the most relevant standard prescribed by customary international law is that of reasonableness" and claim that "the exclusive use attendant upon weapons testing fully comports with the reasonableness criterion."[36] It is submitted that although it is necessary in some cases to resort to the criterion of reasonableness in matters where rules of international law do not exist, in the present instance this criterion is inadmissible as the rules of international law are quite clear in this matter. Considerations of common sense, reasonableness and good faith or, in short, equitable considerations have often been resorted to supplement or progressively develop established rules of international law. In the present instance, however, the introduction of the concept of reasonableness is quite inadmissible because it would enable States to violate established principles of international law by claiming that their action is "reasonable". Even if the criterion of reasonableness were ad-

35. Oppenheim, *International Law*, Vol. I (1957), p. 589.
36. McDougal and Bruke, *op. cit.*

missible in this matter, it is difficult to see how McDougal and Burke could have arrived at their present conclusions. A reasonable and *bona fide* exercise of a right is one which is appropriate and necessary for the purpose of the right, *i.e.*, in furtherance of the interests which the right is intended to protect. It should at the same time be fair and equitable exercise of the right and not one which is calculated to procure for the party concerned an unfair advantage. The exercise of a right in such a manner as to prejudice the interests of other parties is unreasonable. It follows, therefore, that a legitimate exercise of a right is compatible with international law, while the exercise of the right contrary to the principles of good faith and reasonableness would be incompatible therewith. McDougal and Burke appear to claim that the carrying out of nuclear tests on the high seas is reasonable exercise of a right and has been exercised by the testing States with reasonable regard to the interests of other States in their exercise of the freedom of the high seas. Every State has, no doubt, the right to use the high seas, but the exercise of the right to use the high seas would be unlawful if it were exercised in such a manner as to cause harm to other users of the high seas. The fall-out from nuclear tests contaminate the fish and waters of the high seas. This harmful effect alone, apart from the other effects, is sufficient to maintain that the right to use the high seas is being misused or abused in such a manner as to cause harm to others. The exercise of a right in such a manner as to harm or prejudice the interests of others is unreasonable and incompatible with international law. If a right is exercised in such a manner that it does harm to the general interests of others and infringes on the rights of other States, it is not a reasonable exercise of a right but an *abus de droit*. It has been established by scientific evidence that the radioactivity which arises out of thermonuclear experiments pollutes both the sea and the air over the sea, leads to the destruction of the living resources of the sea, and creates a danger to all mankind in the nature of long-term radioactive fall-out in the form of strontium 90 and caesium 137. The carrying out of nuclear tests, therefore, cannot be said to be a reasonable exercise of the right to use the high seas as the right is being exercised in such a manner as to cause harm to the general interests of other States who are entitled to a free and full use of the high seas.

A treaty prohibiting certain nuclear tests has now been entered into by the United States, Britain and the Soviet Union. The treaty was signed in Moscow on 5th August, 1963 by the Foreign Ministers of the United States, Britain and the Soviet Union. The object of the treaty appears to be to prevent the carrying out of nuclear tests which result in radioactive fall-out, and only such tests are prohibited. The preamble states that the parties desire "to put an end to the contamination of man's environment by radioactive substances" and Article I lays down that "the parties undertake to prohibit, to prevent and not to carry out any nuclear weapons test explosion" which " causes radioactive debris to be present outside the territorial limits of the State under whose jurisdiction or control such explosion is conducted". All such tests are prohibited "in the atmosphere, beyond its limits, including outer space or under water, including territorial waters or high seas." It is stated that "the provisions of this sub-paragraph are without prejudice to the conclusion of a treaty resulting in the permanent banning of all nuclear test-explosions including all such explosions underground."

The treaty, however, prohibits only atmospheric nuclear tests, *i.e.*, tests which are conducted on or above the earth's surface, on land or at sea, and as such underground nuclear tests are not prohibited. The possible reason behind this distinction lies in the fact that all atmospheric tests, whether they are conducted on land or at sea, result in radioactive fall-out which cannot be confined to "danger zones" or to " the territorial limits of the State under whose jurisdiction or control the explosion is conducted." Every such test results in the radioactive fission products being drawn into the stratosphere and these fission products gradually spread over a large part of the world and return ultimately to the earth in the form of rain or snow. Scientific evidence has now established that such tests have harmful effects and the preamble to the treaty expressly states that the treaty has been concluded with a view "to put an end to the contamination of man's environment by radioactive substances." The harmful effects of such tests therefore appear to be acknowledged by the signatories and the British Foreign Secretary, Lord Home, has stated that "every human family can live from now on free from the fear that their unborn children may be affected by man-made poison in the air.[37]" This

37. *The Statesman, New Delhi*, 6th August, 1963, p. 1.

official recognition of the harmful effects of such tests brings considerable satisfaction to those who have striven for so long to prove that such tests have harmful effects and should therefore be prohibited.

As already stated, the treaty does not prohibit the carrying out of underground nuclear tests for the apparent reason that such tests do not result in radioactive fall-out. Scientists now claim that it can be planned with confidence how far to bury a bomb of a given size so that no radioactivity escapes and it is said that the general features of an underground explosion can now be predicted. It is claimed that such tests result in no fall-out, no movement of the soil surface and only in relatively slight earth tremors. The parties to the treaty, however, state that "they seek to achieve" the prohibition of "all nuclear test explosions, including all such explosions underground." Tests carried out underground may not result in fall-out, but what their other effects will be, have yet to be seen. The explosion of a 50-megaton bomb underground, for instance, may result in more than a relatively slight earth tremor.

Article 3 of the treaty states that any State "may accede to it at any time" and a number of States have already expressed a desire to do so. The Government of France has, however, stated that France will not accede to the treaty. This is particularly unfortunate in view of the fact that France is the only country, apart from the signatories, which is in a position to test nuclear weapons. In 1960, France began a series of nuclear tests in the Sahara desert and has carried out about five tests of atomic bombs up to date. The first three tests were carried out on 13th February, 1st April and 27th December, 1960, the fourth test was conducted on 25th April, 1961 and the fifth test was reported to have been carried out in or about June 1962. All these tests were carried out in the Southern Sahara and have aroused considerable protests from neighbouring African States. France is now expected to carry out further tests in this region as she has reiterated that she will not be bound by the treaty prohibiting such tests. The Foreign Minister of France, Mr. Maurice Couve de Murville, is reported to have told the French Parliament that France would continue with her nuclear programme.[38]

38. *Ibid* 27th July 1963, p. 7.

The treaty signed at Moscow on 5th August, 1963 is somewhat limited in its application. Its limitations lie in the fact that all the nuclear powers are not bound by it and it does not prohibit all types of tests. It is, however, to be welcomed because atmospheric tests, resulting in fall-out, are clearly the most harmful of all tests and the signatories to the treaty are those who possess the most powerful and therefore the most harmful of these weapons. It is to be hoped that all States will accede to the treaty and desist from future programmes to develop such weapons. Unfortunately, one State, the People's Republic of China, which may possess these weapons in the near future, has denounced the treaty and is reported to be proceeding with her programme to develop the nuclear weapon.[39] As long as this situation persists, the dangers of nuclear tests still remain to be obviated as more and more States may come to possess such weapons and are at present still free to test them. Furthermore, as long as the United States, Britain and the Soviet Union continue to test nuclear weapons underground and France continues to test such weapons in any environment she chooses, the fear of nuclear weapons may cause other nations to strive to develop such weapons and mankind may again be faced with the hazards of atomic radiation as a result of a new test series by emergent nuclear powers. It is therefore the duty of international lawyers to continue to attempt to counter this grave threat by formulating a suitable doctrine of international law which contributes towards the bringing about of the cessation of all nuclear tests. It is to be hoped that the dictates of humanity and public conscience, invoked by the test ban treaty, will carry weight also in countries which refuse to accede to the treaty, and that all States will ultimately accede to such a treaty so that the humanitarian codes of international law will comprise the prohibition of all nuclear tests.

ANNEXURES*

A. 1956 Report of the United Nations Scientific Committee on the Effects of Atomic Radiation.

B. 1958 Report of the United Nations Scientific Committee on the Effects of Atomic Radiation.

39. *Ibid.*

*These have not been reproduced here.

C. The Conclusions of the United Nations Scientific Committee on the Effects of Atomic Radiation—Extracts from the 1962 Report of the United Nations Scientific Committee on the Effects of Atomic Radiation.

D. The Long Range Fall-Out from Nuclear Test Explosions. The Hazards to Man of Nuclear and Allied Radiations Medical Research Council, 1958, H.M.S.O., London.

E. The Effects of Radiation and An Assessment of the Hazards of Exposure to Radiation. The Hazards to Man of Nuclear and Allied Radiations. Medical Research Council, 1958, H.M.S.O., London.

VI. DRAFT REPORT ON THE LEGALITY OF NUCLEAR TESTS

As Prepared by the Secretary and Presented to the Fifth Session

VI. DRAFT REPORT ON THE LEGALITY OF NUCLEAR TESTS

As Prepared by the Secretary and Presented to the Fifth Session

This Committee at its Third Session held in Colombo in January 1960 decided to take up for consideration the question of Legality of Nuclear Tests, a subject which had been suggested by the Government of India under article 3(c) of the Statutes of the Committee being a matter of common concern to all the participating states in this Committee. The Committee decided to take up this subject especially in view of the fact that this matter had not been considered by any other Body from the legal point of view nor had it been adequately dealt with by any of the authorities on International Law. The Committee also took note of the fact that several nuclear tests had been carried out in parts of the Asian-African continents or in areas adjacent thereto and as such the problem was of great concern to the Asian-African countries. The Committee directed its Secretariat to collect the factual and scientific data that were available on the effects of the nuclear tests and also to prepare a list of topics for discussion on the legal aspects of the matter.

At its Fourth Session held in Tokyo in February, 1961, the Secretariat of the Committee presented before it the relevant material both from the scientific and legal point of view which formed the basis of discussions at that Session. The Members for Burma, Ceylon, India, Indonesia, Iraq, Japan, Pakistan, Morocco and the United Arab Republic stated their respective viewpoints. The Committee also heard statements from the Observer for Ghana and Mr. F.V. Garcia-Amador, then a Member of the International Law Commission, in his personal capacity as a recognised expert. The Committee after a general discussion decided to study the matter further and to take up the question for fuller consideration at its Fifth Session. The Committee, however, indicated the scope of its study and directed its Secretariat to collect further material on those lines. The Committee decided that it was not concerned with the controversial and debatable question regarding use of nuclear weapons in times of war but that it should confine itself to an examination of the problem of Legality of Nuclear Tests in times of peace. In accordance with the decision taken by the Committee at its Tokyo Session,

the Secretariat prepared a comprehensive brief which has been placed before the present Session on the basis of which the matter has been fully considered. The Committee heard the viewpoints and expressions of opinion on the various topics arising on this subject from the Members from Burma, Ceylon, India, Indonesia, Japan, Pakistan, Thailand and the United Arab Republic (the Members for Iraq and Morocco being unavoidably absent). The Governments of Japan and the United Arab Republic also submitted written memoranda on the subject. The Committee also invited the observers from Ghana, Laos, the Philippines, the representatives of the Secretary-General of the United Nations, the representative of the League of Arab States (an Inter-Governmental Organisation) and Dr. Radhabinod Pal, Member of the International Law Commission in his personal capacity as an expert, to express their views, if they so wished, having regard to the importance of the subject.

The first question which this Committee has to consider is whether or not the effects of the nuclear tests are harmful, because the Committee's opinion on the legal issues must necessarily depend to a large extent on its finding on this issue. The Secretariat has placed before the Committee a good deal of material on this issue which includes the Reports of the United Nations Scientific Committee on the Effects of Atomic Radiation drawn up in 1958 ; the Proceedings of the International Conference on the Peaceful Uses of Atomic Energy 1955, Vol. 13 ; the publications of the British Medical Research Council entitled "Hazards to Man of Nuclear and Allied Radiations" and the Report published by the Physics Department, Faculty of Science, Alexandria University, Cairo. The Committee's attention was drawn both at the Tokyo Session and at the present Session to a Japanese publication entitled "Research on the Effects and Influences of Nuclear Bomb Test Explosions" which gives a factual account of the effects of nuclear explosions over Hiroshima and Nagasaki in 1945 as also the effects of the nuclear tests carried out in the Pacific in 1954. The Secretariat of the Committee has also studied a number of other publications and documents and has placed before the Committee a summary of the facts given therein.

Every nuclear weapon test amounts in effect to explosion of a nuclear weapon, and it would appear that destruction which results

from such tests may be or are capable of being of the same magnitude as that resulting from the use of a nuclear weapon. This is borne out by the factual details given regarding the effects of the nuclear tests carried out in the Marshall Islands in 1954 as set out in the study prepared by the Secretariat on the subject. Although accurate details regarding the effects of nuclear weapon tests carried out by some countries are not available, it would be reasonable to assume, in the absence of evidence to the contrary, that the effects would be the same or are likely to be the same. The study prepared by the Secretariat on the factual and scientific aspects of the matter as well as other scientific material placed before the Committee appear to make out a case that the nuclear weapon tests do result in harmful effects in the present state of scientific development, that is to say : (1) The explosions resulting from such tests cause or are capable of causing indiscriminate destruction of lives and property not only in the place where such explosions take place but over a wide area ; (2) In the present state of scientific development it is not possible to control the effect of such tests nor to confine them to a particular area, and miscalculations may occur as in the case of Marshall Island tests resulting in much indiscriminate destruction ; (3) The test explosions result in fall-out of radioactive fission products which in some cases may be global and which may persist for over a period of ten years after the explosion of a nuclear weapon ; (4) Atomic radiations have harmful effect on human beings from the biological and genetic aspects, and as such not only are detrimental to the present generation but also to future generations ; (5) Nuclear tests, if carried out on the high seas, result in closing of large areas of the seas to navigation and to destruction of the living resources of the seas ; (6) The carrying out of these tests may necessitate mass movement of the population from the area where such tests are to be conducted.

The Delegation of Japan, in the course of discussion at the Tokyo Session of the Committee expressed some doubts as to whether scientific evidence did establish that the nuclear tests have harmful effect on the human beings. The Report of the United Nations Scientific Committee, especially its conclusions (Appendix I) would appear to leave little room for doubt in this matter. The delegation of Thailand has at the present session stated that all nuclear tests may not result in harm to mankind. The Committee does not

dispute this possibility but on such matters the Committee must be guided by scientific material. As at present the Committee is not aware of any material or findings by scientific bodies or has its attention been drawn to any such material which would show that present nuclear weapon tests can be carried out without causing adverse effect to man. It has sometimes been asserted by some of the testing States that no adverse consequences ensued from a particular test or tests. This may be true in so far as direct damage is concerned in the shape of destruction of lives and properties due to the precautions taken, but having regard to scientific evidence the hazards from "fall-out" and "atomic radiation" even in regard to such cases cannot be eliminated. Apart from this the risk or possibility of destruction would appear to be there in all cases since according to the scientific evidence it is impossible to control the effect of such tests in advance. The Committee has not before it any scientific material regarding the effects of underground tests and can express no opinion on the assertion that long range fall-out may be controlled in such tests.

The Committee sees no reason to doubt the findings of the research and medical institutions whose reports have been placed before the Committee by the Secretariat as stated above. In the opinion of some of the Delegates the available scientific and factual material makes out a *prima facie* case whilst in the opinion of others such evidence conclusively proves that nuclear tests cause unaccountable damage and harm to man. In either view of the matter the Committee considers that in the absence of factual and scientific evidence to the contrary it would be reasonable to proceed on the basis that nuclear tests have harmful effect in considering the legal issues. The Committee's conclusions must be understood to have been made on this basis.

It has been pointed out in the course of discussions by various Delegates, particularly those of Japan, Pakistan and Thailand, that the question of nuclear tests and their cessation was essentially a political one and any expression of views on the legal aspects of the problem may not affect the decision of the testing States in one way or another. It was stated that cessation of these tests could be brought about only by means of an agreement among the great powers which were the testing States. The Delegate of Pakistan

also observed that an effective ban on nuclear tests is not feasible without inspection and control. It has been emphasised by the Delegate for Japan that stress should be laid on the moral and humanitarian aspects of the matter to call for cessation of the tests rather than rely on principles of international law. The Delegate of Pakistan also stressed the moral and ethical aspects of the matter. The Committee is not unaware of these considerations but the task before it is to examine the legal aspects of the problem. The Committee proceeds to do so with the view that the Committee's findings may help the participating countries in the Committee in formulating the viewpoint on this aspect of the problem especially as no other Body of Legal Experts have had occasion to examine this problem. The Committee also hopes that nations of the world which have progressively been adhering to the principles of international law would be prepared to do so even in this field and political considerations may well be influenced by the legal aspects of the matter. A further point was raised by the Delegate for Thailand, that is, that the Committee should consider the question of international control of nuclear tests rather than discuss the question of their legality or otherwise. In his opinion, all nuclear tests were not *per se* illegal because if such tests caused no damage they could not be declared illegal. He, however, suggested that the tests should be internationally controlled, and wished that matter to be discussed. The Committee finds some difficulty in considering this question as at present in view of the fact that it is doubtful whether such questions which are essentially political would fall within the competence of this Committee, which is an Advisory Body of Legal Experts and in any event this question would not appear to be covered by the Committee's present terms of reference on the subject. It has already been stated that the Committee's examination of the legal aspects of the problem and its conclusions are made on the basis that nuclear weapon tests have harmful effect which appears to be made out by the available scientific and factual material. It is clarified that should evidence to the contrary be available different considerations may prevail on which the Committee expresses no opinion at present.

The Committee in proceeding to discuss the legal issues involved in the problem would first consider the case of a nuclear test carried out by a State in its own territory. There can be little doubt that

a State enjoys and is entitled to enjoy full and complete sovereignty over its own territory and it may well be asserted relying on the doctrine of State sovereignty that in international law a State can use its territory in any manner it likes and no other State may question the activities that a State may wish to carry on in its own territory. This principle, if applicable, would perhaps cover the case of nuclear tests. The Committee, however, finds that international law has never regarded the doctrine of State sovereignty to be absolute in as much as international law regards that in certain circumstances a State may be held responsible to another or other States for its acts even though that act has been committed in the exercise of its sovereignty. For example, it has been well recognised in international law that no State can allow its territory to be used for carrying on of acts prejudicial to other States, and if it does, that State is held to incur responsibility under the law of nations. Again, a State is held to be responsible for an internationally wrongful conduct if it treats a citizen of another State living within its territory in a manner contrary to the principles of the law of nations even though such act is done by a State within its territory and in the exercise of its territorial sovereignty. It is, therefore, clear that a State is not always immune under international law for every one of its acts done in the exercise of its territorial sovereignty and that in certain circumstances a State may incur responsibility for its sovereign acts on the basis that the act amounts to an internationally wrongful conduct.

The basis of the doctrine of State Responsibility is that the members of the community of nations have, in practice, agreeed to respect certain principles for their mutual guidance, and in doing so, it has been understood that they were thereby accepting obligations to observe the conduct prescribed. The failure to meet these obligations imposes upon the guilty State the further obligation to make reparation for the injury caused.[1] In the traditional international law a State incurs responsibility in cases where it commits acts detrimental to another State or its nationals and actual damage or injury is caused by such acts. Reparation has to be made, the quantum of which is determined according to the nature of the damage or injury suffered. It, therefore, seems that actual

1. Eagleton, *The Responsibility of States in International Law*, 1928, p. 3

damage or injury would need to be proved before reparation can be claimed on the basis of State responsibility. Apply the test of State responsibility to the present situation, it would appear that a State conducting nuclear tests even in its own territory would be responsible for its acts if the tests result in causing harm or injury to another State or its nationals. It is perhaps not open to doubt that if the nuclear test explosions caused destruction of life and property in another State or that of an alien in its own territory, the doctrine of State responsibility in international law would be attracted. But the question is whether this is the only class of case where a State would incur responsibility. International law nowhere defines as to what would be regarded as damage or injury to another State or its nationals. Hitherto lawyers have come to regard loss of life, bodily injury, loss or destruction and damage to property as cases where reparation becomes payable if such result ensues to the citizens of a State or their property due to the wrongful acts of another State because these were the only types of harm or damage that could be contemplated and were known to us. These instances would appear to be by no means exhaustive and in the view of this Committee, there is no reason why other forms of harm or damage should not form the basis of State responsibility. International law is not and cannot be static and it must keep pace with the rapid development of science. Indeed, nations have always agreed to observe new code of conduct to meet a new situation, for instance, with the development and growth of air travel there has come into recognition a set of rules for regulating the conduct of the States in that sphere. The testing of nuclear weapons have raised problems of a new kind because scientific evidence shows that such tests result in local and global radioactive fall-out and that biological and genetic effects of atomic radiation constitute a great hazard to man. This type of damage, which according to scientific material, not only is injurious to the present generation but to future generations and which certainly appears to be much more serious than the loss of life or property of a person, could never have been contemplated in the traditional international law. Scientific evidence also shows that nuclear tests result in the pollution of the atmosphere and alter the global environment in a manner clearly harmful to mankind. Should such categories of harm be disregarded in the application of the doctrine

of State responsibility? The Committee considers that this question ought to be answered in the negative.

The Committee takes note of the observation in Oppenheim's *International Law* that "the increasing complexities of modern international relations, in particular having regard to the unlimited potentialities of scientific weapons of destruction, may call for far reaching extensions of responsibility expressly declared by International Law."[2] The Committee further notes that even in the municipal law of tort under various systems of law the doctrine of liability has been extended from time to time to meet new situations arising out of modern scientific developments. The Committee is , therefore, of the opinion that a State ought to incur responsibility for damage or harm caused by the nuclear test explosions even though such harm or damage is of a kind other than direct loss of life or bodily injury and damage to or destruction of property.

It has already been observed that under the traditional doctrine of State responsibility proof of damage is essential to establish a claim. This principle appears to be based on the fact that the types of damage or injury known to international or municipal law were capable of being proved by direct evidence. Even so in the municipal law of tort courts have been known to have awarded damages for injuries like "the loss of expectation of life"[3] which could only be calculated on the medical or scientific data regarding the normal span of a human life. The Committee considers that it would be reasonable to proceed on the basis of scientific data regarding the effects of nuclear explosions in determining the question as to whether damage has been caused or not. The Committee is of the opinion that it would be safe to proceed on such data since the harmful effects of a nuclear explosion according to scientific evidence may not become apparent for years to come.

The Committee is of the opinion that in the present state of scientific evidence it is reasonable to assume without further proof that every nuclear test causes harmful effect, the degree of such harm varying according to the size of the weapon, and that such effects cannot be confined to the territories of the testing State.

2. Oppenheim—*International Law*, 8th Ed., p. 342.
3. *Rose* v. *Ford* (Decision of the Court of Appeal in England).

The harm caused, even though not apparent, may manifest itself at a later date. The Committee, therefore, considers that a State testing a nuclear weapon should incur responsibility by reason of conducting that test without the fresh requirement of proof of actual damage in view of the available scientific data regarding the harm that the explosion of nuclear weapon causes or is capable of causing. It is, of course, open to a testing State to prove by means of scientific evidence that the test had no harmful effect. The Committee is conscious of the fact that its recommendations in this regard may result in a shift of onus of proof, but having regard to the fact that the available scientific data on the general result of nuclear explosions makes out a *prima facie* case regarding the harmful effects of such tests, it would not be unreasonable to shift the onus. The same result will follow if the doctrine of "Strict or Absolute Liability" known and recognised in all civilised legal systems is adopted in the sphere of State responsibility. This aspect of the matter will be discussed later more fully.

State responsibility may also arise as a result of an abuse of a right enjoyed by virtue of international law. This occurs when a State avails itself of its right in an arbitrary manner in such a way as to inflict upon another State an injury which cannot be justified by a legitimate consideration of its own advantage.[4] The International Court has expressed the view that "in certain circumstances, a State, while technically acting within the law, may actually incur liability by abusing its rights"[5] and individual judges of the court, such as Judge Azevedo, Judge Alvarez and Judge Anzilotti, have referred to this principle in their judgments.[6] Oppenheim observes that the maxim, *sic utere tuo ut alienum non laedas*, is applicable to relations of States no less than to those of individuals ; it underlines a substantial part of the law of tort in English law and the corresponding branches of other systems of law, it is one of the general principles of law recognised by civilized States which the Permanent Court is bound to apply by virtue of Article 38 of its

4. Oppenheim, *International Law*, Vol. I (1957), p. 345.
5. *Free Zones of Upper Savoy & the District of Gex*, Series A, No. 24, p. 12 and Series A/B, No. 46, p. 107.
6. Refer particularly Judge Alvarez in *Admission (General Assembly) Case*. I. C. J. Reports, 1950, p. 15.
7. Oppenheim, *International Law*, Vol. I, (1957), pp. 346-347.

Statute.[7] The doctrine of the prohibition of abuse of rights appears, however, to be of recent origin in international law and the precise extent of its application is still controversial.

Very few writers on international law have examined the question of the applicability of the doctrine of abuse of rights in international relations. The question was first considered officially at the Proceedings of the Advisory Committee of Jurists in 1920 when that august body was drafting the Statute of the Permanent Court of Justice. When Article 38 regarding the sources of international law was being discussed, Ricci-Busatti, the Italian member of the Committee, expressed the view that the principle 'which forbids the abuse of rights' was one of the 'general principles of law recognised by civilised nations' and was of the opinion that the Permanent Court should apply this principle when deciding cases referred to it.[8]

In his lectures at the Hague Academy of International Law in 1925, Politis expressed the view that the doctrine of abuse of rights was of great importance for the development of international law relating to State responsibility and advocated its progressive application as one of the 'general principles of law' referred to in Article 38 of the Statutes of the Permanent Court.[9] In 1933, in his treatise on *The Function of Law in the International Community*,[10] Lauterpacht was of the opinion that the doctrine of the abuse of rights was 'one of the basic elements of the international law of torts', and in a recent treatise on *The Abuse of Rights in International Law* published in 1953, Kiss has expressed the view that the prohibition of the abuse of rights is a general principle of international law.[11] Schwarzenberger, on the other hand, is of the opinion that 'in the cases and situations usually mentioned in support of the recognition and applicability of the doctrine of international law, there have been no real abuse of rights but breaches of a prohibitory rule of international law.'[12] Cheng considers the theory of abuse

8. Ricci-Busatti, Proceedings of the Advisory Committee of Jurists, 1920, pp. 315-316.
9. Recueil des Cours de L' Academie de Droit International, 1925, Vol. 6, p. 108.
10. *The Function of Law in the International Community*, 1933, p. 298.
11. L' Abus de Droit en Droit International, 1953, pp. 193-1956.
12. Recueil des Cours de L'Academie de Droit International, 1955, Vol. 87, p. 309.

of rights as 'recognised in principle both by the Permanent Court of International Justice and the International Court of Justice' and is of the opinion that the doctrine is merely an application of the principle of good faith to the exercise of rights. In his treatise on *The General Principles of Law* this author gives a comprehensive analysis of the various applications of this doctrine in practice.[13]

A survey of the jurisprudence of the International Court of Justice and the Permanent Court of International Justice clearly shows that the basic principles of the prohibition of abuse of rights have been applied in cases. In the *German Interests Case* (1926) the Permanent Court of International Justice applied this doctrine.[14] In the *Free Zones Case* (1932) the Permanent Court applied the same principle in a case where France was under treaty obligations to maintain certain frontier zones with Switzerland free from customs barriers.[15] The principle of good faith requires every right to be exercised honestly and loyally. Any fictitious exercise of a right for the purpose of evading either a rule of law or a contractual obligation constitutes an abuse of the right, prohibited by law. In 1951 the International Court of Justice, when considering the right to draw straight line bases for the purpose of delimiting the territorial sea, mentioned the 'case of manifest abuse' of this right in the *Anglo-Norwegian Fisheries Case* (1951).[16]

The doctrine of the abuse of rights has also been applied by municipal courts, arbitral tribunals and claims commissions. The Mexican-United States General Claims Commission, for example, expressed the following opinion on the matter in the *North American Dredging Co. of Texas Case* (1926) :

> "If it were necessary to demonstrate how legitimate are the fears of certain nations with respect to abuses of the rights of protection and how seriously the sovereignty of those nations within their own boundaries would be impaired if some extreme conception of this right were recognised and

13. *General Principles of Law as applied by International Courts & Tribunals*, 1953, pp. 121-136.
14. Permanent Court of International Justice, Series A, No. 7, pp. 30-37.
15. Permanent Court of International Justice, Series A/B, No. 46, p. 167.
16. International Court of Justice Reports, 1951, p. 142.

enforced the present case would furnish an illuminating example."..

The principles underlying the doctrine of the abuse of rights may also be illustrated by the decision in the *Trail Smelter Arbitration*. The question in issue was that of State responsibility for nuisance to adjacent territory as the claim related to damage done in the United States to crops, pasture lands, trees and agriculture generally as well as to livestock as the result of sulphur dioxide fumes emitted from a smelting plant in British Columbia in Canada. In this case, therefore, there was, on the one hand, the right of a State to make use of its own territory, and, on the other hand, the duty of a State at all times to protect other States against injurious acts by individuals within its jurisdiction. Taking into account the conflicting interests at stake and the analogous cases in municipal law, the Tribunal arrived at the following conclusion:

> "Under the principles of international law, as well as of the law of the United States, no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence."[17]

The Tribunal held Canada liable on the ground that there was a violation of the obligation to protect other States from injuries emanating from its territory and this violation constituted an abuse of right, an unlawful act. While acknowledging that it knew of no previous international decision concerning air or water pollution, the Tribunal cited the decision of the Federal Court of Switzerland in *Solothurn* v. *Aargan* relating to target practice[18] and the decision of the United States relating to pollution in *State of Missouri* v. *State of Illinois*. The Tribunal clearly regarded the general principle of the duty of a State to protect other States from injurious acts within its

17. Annual Digest & Reports of Public International Law Cases, 1938-1940, Case No. 104, pp. 315-333.

18. Refer Schindler, "The Administration of Justice in the Swiss Federal Court in International Disputes", 15 *American Journal of International Law*, 1921, pp. 121-174.

jurisdiction, which it traced back to the *Alabama Claims Arbitration*, as of wider application. It is for consideration, therefore, that if a State uses its own territory for conducting nuclear tests whether in such a case injury due to atomic radiation is as much a ground of liability as injury due to noxious fumes on the principles laid down in the *Trail Smelter Arbitration*. It appears that having regard to the scientific data available on the extent of the damage or injury that nuclear weapon tests cause or are capable of causing, the principle of the decision in this case ought to be applied in the present situation.

In considering the question as to whether a State carrying out nuclear tests on its own territory can be said to abuse its rights of State sovereignty, it is necessary to deal with the point raised in the course of discussions in this Committee regarding "Justification". It has been pointed out that a State testing nulcear weapons may sincerely believe that possession of nuclear weapons and testing thereof to perfect such weapons is not only necessary for its own self-preservation but also for the preservation of other nations and as such it could not be said that testing of nuclear weapons in its own territory was an abuse of a State's rights because it was done for a legitimate purpose. On the other hand, it is stated that there could be no justification for these tests since testing of nuclear weapons by a State or group of States result in similar activities by the other group of States. It has also been said that nuclear or thermo-nuclear tests result in world tension and increase the possibility of war. The Committee does not doubt that there may be two possible views about the necessity or justification of these tests for self-preservation or preservation of a group of nations. But what it has to consider is whether it is permissible according to the legal concepts that a State should be allowed to indulge in activities, however necessary it may be for the purpose of its self-defence, which result in polluting the atmosphere of the world and which cause untold harm to man as established by scientific evidence. Even in the traditional doctrine of State responsibility, a state is liable to make reparation for injuries caused to other states or its nationals by its acts. The Committee also is of the opinion that considerations of self-defence may not be a very vital factor on this question. The justification of an action in self-defence is generally valid when one considers the activity of a

particular state in reference to a particular act. But here what the situation provides is not a single act by a State but a type of activity carried on by a number of States each trying to justify it on the ground of self-defence because another State is also carrying on the same kind of activity. In such situation it appears to be extremely doubtful whether justification on the ground of self-preservation is at all a relevant consideration. The scientific data shows that each nuclear test adds its quota of radioactive material which pollutes the air and causes harm to man. The Committee is of the opinion that States whose nationals suffer from the ill effects of these tests are entitled to maintain that the testing State is responsible under the doctrine of State responsibility even though the testing State may legitimately believe that it is carrying out such tests for its own preservation or preservation of other nations. Another factor to be taken note of is whether doctrine of self-preservation would extend to authorising of such preservation by adopting of means which result in indiscriminate destruction of life and property and cause harm not only to the present generation but also to succeeding generations. It is also to be noted that even in a war use of poisonous gas by a State which is fighting for its own preservation is forbidden by international law on the ground that such means cause indiscriminate and unnecessary harm and as going beyond the legitimate means of warfare. It therefore appears to be all the more reason why in times of peace nuclear tests, which result in the pollution of the air and atomic radiation, should not be permitted by international law even though such testing of nuclear weapons may be done with the legitimate belief of self-preservation.

The matter may now be considered from another angle, that is whether a State can be said to commit an international tort by reason of its resorting to nuclear weapon tests. The terms "international tort" and "international illegal act" appear to be synonyms for 'the breach of international obligations'. Thus the breach of any international obligation whether it rests on *lex inter partes* of a treaty, a rule of international customary law or a general principle of law recognised by civilised nations, constitutes an international tort'.[19] In international law, however, the law of torts is confined to very general principles and is still in a process of development. The

19. Schwarzenberger, *International Law*, 1957, Vol. I.

absence of any clearly settled authorities on questions of tortious liability in international law, however, need not necessarily dispose off the matter. International law, like other branches of law and perhaps more so, is constantly developing and is influenced by new principles arising out of international relations. As already observed, the general theory of tortious liability in municipal law has been adapted in modern times to the needs of an industrialised society. In English law, for instance, it was in the first quarter of the twentieth century that the great English jurist, Sir Frederick Pollock, formulated the new principles of tortious liability which were necessary to adapt the law of torts to the needs of an industrialised society[20]. Sir Frederick Pollock has observed that 'all members of a civilised commonwealth are under a general duty towards their neighbours to do them no hurt without lawful cause or excuse'. Is the international community of sovereign States a 'civilised commonwealth' in this respect? Is there a place in contemporary international law for these general principles that one must not do unlawful harm to one's neighbours, and, if so, is there an international tort involving the legal liability of a State for damage caused by nuclear tests? It has been suggested that there is nothing inherently unreasonable in the conception of such an international tort as there may well be an analogy with the liability for breach of absolute duties attached to the ownership and custody of dangerous things in municipal law. The definition of the sources of international law embodied in Article 38 of the Statute of the International Court has now won world-wide acceptance and 'the general principles of law recognised by civilised nations' are universally accepted as a third source of international law. Contemporary international law may accordingly be fertilized and progressively developed by recourse to the general principles of law of the major legal systems of the world. It is, therefore, reasonable to hold that in cases where neither international convention nor custom furnish a satisfactory rule of law, a rule of international law may be deduced from the general principles of law recognised by civilised nations and these principles include the general principles of law of all the major legal systems of the world.

The Western law of liability of harmful acts, in civil law and common law countries alike, recognises general obligation not to

20. Refer Pollock, *The Law of Torts* (1929), Chapter I.

inflict unlawful harm on one's neighbour. The obligation is based partly on liability for fault, including negligence, and partly on an absolute liability for dangerous things. Sir Frederick Pollock, in his treatise on *The Law of Torts*, observes that the principle accepted by Anglo-American common law is that it is a wrong to do wilful harm to one's neighbour without lawful justification or excuse.[21] This position was reached in the common law after a long process of development which is analysed by Winfield in his jurisprudential study, *The Province of the Law of Tort*.[22] The principle of general responsibility for unlawful harm to one's neighbour is also recognised by France in Article 1382 of the *Code Napolean* and by Italy in Article 2043 of the *Italian Civil Code*. The same principle is adopted in Germany in Sections 823 and 826 of the *German Civil Code*,[23] and the *Swiss Code des Obligations* incorporates the same principle in Article 41[24]. This principle also appears to be fully accepted in the Soviet Union in Article 403 of the *Soviet Civil Code*.[25] It may be said, therefore, that the major legal systems of Europe recognise a general obligation not to inflict unlawful harm on one's neighbour. In general, the law of liability for unlawful harm, in the countries of Europe, is based on the principle of fault, which is inherited from the conception of *dolus* and *culpa* in Roman law, but the principle of fault has in recent times been qualified in some form by giving the principle of absolute liability in respect of dangers created by the respondent a substantially wider application than was known to Roman law.[26] Thus in English law there is the rule in *Rylands v. Fletcher* which lays down that:

> "The person who for his own purposes brings on his land and collects and keeps there anything likely to do mischief, if it escapes, must keep it in at his peril, and, if he does not do so, is *prima facie* answerable for all the damage which is the natural consequence of its escape.[27]

21. F. Pollock, *The Law of Torts* (1920), Page 20.
22. P. H. Winfield, *The Province of the Law of Tort* (1931).
23. Refer *Manual of German Law* (1950), United Kindgom Foreign Office; Vol. I, pp. 100-108.
24. Refer 'Recucil Systematique des Lois et Ordonnances', 1847-1947, page 41.
25. Refer Gsovski, *Soviet Civil Code* (1948), Vol. I, pp. 488-490.
26. For an analysis of the development of thoory of absolute liability in the common law, refer: Buckland & Mc Nair, *Roman Law & Common Law* (1936), particularly pp. 313-3 4; with regard to the civil law refer : F. H. Lawson, *Negligence in the Civil Law* (1950).

In American law, there is the principle of liability for ultra-hazardous activities, which has been stated thus :

> "One who carries on an ultra-hazardous activity is liable to another whose person, land or chattels the actor should recognise as likely to be harmed by the unpreventable miscarriage of the activity, for harm resulting thereto from that which makes the activity ultra-hazardous, although the utmost care is exercised to prevent the harm."[28]

In French law, there is the *theorie du risque cree*[29] and in German law there is the principle of responsibility for risks.[30] The principle of absolute liability for dangerous things has therefore been accepted by the major legal systems of Europe and America. This principle is also recognised by the legal systems of Asia and Africa which have been profoundly influenced in matters of tort by the common law and the civil law. The principle that one must not do unlawful harm to one's neighbours is also recognised by Islamic law as codified in the *Majalla*. The principle of absolute liability for dangerous things also forms part of the civil law of India and Japan. It may be said, therefore, that the major legal systems of the world recognise a general obligation not to inflict unlawful harm on one's neighbour and base this obligation partly on liability for fault and partly on absolute liability for dangerous things. These principles of law recognised by all civilised nations may therefore be regarded as a source of international law and has an important bearing on the development of international law in the field of international torts and tortious liability. The general principle of law recognised by all nations that 'one must not do unlawful harm to one's neighbours' should in the opinion of this Committee be applicable in international law if a universal system of international law is to continue to develop

27. L. R. 3. H. L. 330; refer Winfield, *Law of Tort* (1954)—pp. 584-614.
28. American Law Institute, *Restatement of the Law of Torts*, (1938), Vol. 3, pp. 41-53.
29. For an analysis of the *theorie du risque cree* refer: Planiol, Traite elementaire due droit civil, 3rd ed. 1949, Vol. 2, pp. 315-317.
30. Refer U. K. Foreign Office, *Manual of German Law*, (1950), Vol. I. pp. 108-110.

in accordance with modern scientific developments. All systems of municipal law prevent an owner of property from doing acts on his property and dealing with it in a manner dangerous to neighbouring owners. A similar doctrine, based on this universally accepted principle of absolute liability for dangerous things, should be applicable in international law and a State harbouring dangerous things on its territory or carrying out dangerous experiments within its territory should be liable for damage caused to neighbouring States. A State has no doubt sovereign authority over its own territory but it is under an obligation not to perform any acts on its territory which will have harmful effects on neighbouring States. A State which harbours dangerous things on its territory or carries out dangerous experiments on its territory, which causes damage to neighbouring States, should therefore incur legal responsibility to the other States. It appears to be reasonable to hold that this responsibility should extend to every kind of damage including—biological, meteorological, economic and otherwise—which can be traced to the acts of the State on its territory—such acts would be international torts. The legality of the carrying on of nuclear tests in one's own territory if such tests cause harm outside the territory will, therefore, depend on the application of this general principle of law recognised by all nations that "one must not do unlawful harm to one's neighbours." If the rule applies and damage is caused, as is shown by scientific evidence, the testing State would have committed an international tort and will be responsible to the neighbouring States for the consequences of its illegal action.

The next question to be considered is whether these tests can be said to be violative of the United Nations Charter or the principles contained in the Declaration of Human Rights.

The preamble to the United Nations Charter reaffirms the faith of the peoples of the United Nations in fundamental human rights and the dignity and worth of the human person. The Statement of Purposes of the United Nations includes international co-operation in promoting and encouraging respect for human rights and fundamental freedoms. Lauterpacht in his treatise, *International Law and Human Rights*, expresses the view that it would be wholly inaccurate to conclude that the provisions in the Charter relating to human rights are mere declarations of principles devoid of any

element of legal obligation. Any such conclusion is, in the opinion of the learned author, no more than a facile generalisation. The provisions of the Charter on the subject figure prominently in the Statement of the Purposes of the United Nations and Members of the United Nations are, in the opinion of the author, under a legal obligation to act in accordance with these purposes. It is their legal duty to respect and observe fundamental human rights and freedom.

Nuclear tests appear to constitute a hazard to the human race. Even if the tests are carried out within the territory of the testing State, and even if such tests may endanger immediately only the lives and health of the people of the testing State, the carrying out of such tests may still amount to a violation of fundamental human rights, as in the context of the U.N. Charter the welfare of the people of all States, including the testing State, is the common concern of the United Nations and the peoples of the world. Eventually the whole of human life on the globe may be affected by nuclear tests such as the recent 50 megaton bomb explosion. The carrying out of such tests amounts to a wanton disregard for the welfare and safety of the human race. It may perhaps be said that the holding of such tests in gross disregard of the consequences to human life is in violation of the principles of the Universal Declaration of Human Rights and the provisions of the United Nations Charter with regard to fundamental human rights and freedom.

This Committee is of the opinion that no State can act in complete disregard of the elementary dictates of humanity. This position has been accepted as declaratory of the existing law by the International Military Tribunal of Nuremberg as long back as 1946 and the position is also established by rules of international customary treaty law as regards deeds of outrage. The Preamble to the Charter of the United Nations, the Universal Declaration of Human Rights and the adoption of the Genocide Convention clearly establish this humanitarian aspect in international law. In the international law of the war this aspect has long been recognised. The Committee is of the opinion that any testing of nuclear weapons in disregard of the consequences on human lives would be in violation of the recognised principles of international law. The Committee is further of the opinion that international law being regulatory of the conduct of nations *inter se* cannot be said to be devoid of mora-

lity or ethics and this position should not be disregarded by the testing States.

It is also for consideration, whether the conduct of nuclear tests in trust territory is a violation of the United Nations Charter and the Trusteeship Agreement. The provisions of the United Nations Charter dealing with Non-Self Governing Territories and the International Trusteeship System are not easily reconciled with conducting hazardous nuclear experiments in such areas. Article 73 of the Charter of the United Nations states that :—

> "Members of the United Nations which have or assume responsibilities for the administration of territories whose peoples have not yet attained a full measure of self-government, recognise the principle that the interests of the inhabitants of these territories are paramount, and *accept as a sacred trust the obligation to promote to the utmost*, within the system of international peace and security established by this Charter, *the well-being of the inhabitants of these territories*."

Article 74 states that :

> "Members of the United Nations also agree that their policy in respect of the territories to which the Charter applies, no less than in respect of their metropolitan areas, must be based on the *general principle of good-neighbourliness*, due account being taken of the interests and well-being of the rest of the world, in social, economic and commercial matters."

Article 6 of the model Trusteeship Agreement describes even more specifically the responsibilities of the trustee as the administering authority. Article 6(2) states that the administering authority must promote the "economic advancement and self-sufficiency of the inhabitants" by encouraging "the development of fisheries, agriculture and industries" and by protecting the inhabitants against the "loss of their lands and resources." Article 6(3) requires the administering authority to "protect the health of the inhabitants." The removal of the inhabitants of the area in the so-called "danger zones" amounts to removing them from their land and homes and this would amount to violation of Article 73 of the Charter

and Article 6 of the Trusteeship Agreement. Article 73 of the United Nations Charter requires that in administering trust territories the trustee authority must ensure the just treatment of the people of the trust territory and protect them against abuses. It may well be said that it is very unjust and a manifest abuse to explode hydrogen bombs in a trust territory and subject the people there to the hazards of atomic radiation. Under Article 73 of the Charter the administering State has accepted as a sacred trust the obligation to promote to the utmost the well being of the inhabitants of these territories. The explosion of hydrogen bombs on the territory can hardly be said to be promoting the well being of the inhabitants of the territory. It may further be said that although a State may be said to have a certain measure of sovereignty over a colonial territory, the administering authority of a trust territory does not have sovereignty over such territory as it is merely looking after the territory as a trustee under the supervision of the United Nations. It is therefore not entitled to exercise any sovereign rights over the territory and does not have the right to carry out nuclear tests which harm the people of the territory. It follows that the carrying out of dangerous nuclear tests in a trust territory is contrary to the basic principles of trusteeship and constitutes an arrogation of sovereign rights which the administering authority does not possess.

It is also a matter for consideration whether nuclear tests may be carried out in colonial or non-self governing territories. Article 73 of the United Nations Charter defines non-self-governing territories as territories whose people have not yet attained a full measure of self-government. Such territories are not part of the metropolitan area of a State and a State does not possess the same measure of absolute sovereignty over such non-self-governing territories as it has over its metropolitan territory. This is so because the administering State has the responsibility to guide such territories to full self-government and independence and therefore the form of sovereignty exercised over such territories may be called 'conditional sovereignty' *i.e.* a sovereignty exercised under certain conditions for the time being until the territory achieves full independence and develops into a sovereign State of its own. The sovereignty exercised over such territories is therefore merely transitory and is not absolute sovereignty. Articles 73 and 74 of the United Nations Charter would

appear to give specific rights to non-self-governing territories and that these territories are not under the complete and absolute sovereignty of the metropolitan States. As the members of the United Nations have committed themselves to the observance of certain international standards in their relations with their colonies, it is considered that they do not have the right to expose the peoples of these dependent territories, as well as the peoples of the neighbouring territories, to a harmful radioactive fall-out by carrying out nuclear tests in such territories.

The next question for consideration is whether the nuclear tests, if carried out in the areas of the high seas, can be said to interefere with the right of navigation and fishing on the high seas and thus violate a fundamental rule of customary international law.

For the purposes of safety it appears that nuclear tests cannot be conducted without the establishment of a danger zone on the high seas. This may amount to a serious interference with freedom of navigation on the high seas. The vast area has to be patrolled by the testing State to ensure that no ships enter the zone and if any ships inadvertently enter that zone the vessels and the crew may suffer radioactive contamination. The closing of vast areas of the high seas to shipping and aircraft cannot be reconciled with the freedom of navigation on the high seas and in the air space above the seas. The alleged humanitarian purpose behind the closing of such vast areas of the high seas loses its justification when it is recalled that the hazard is artificially introduced. A warning area of 400,000 square miles was created in April, 1954, no doubt induced by the desire of the United States authorities to protect the lives of sailors and fishermen who might be sailing in the surrounding waters, but the debarring of such vessels from a vast area of the high seas aggravate the legal position as the greater the degree of precaution taken, the larger the warning area, and the greater the interference with freedom of navigation on the high seas. The more the area is increased, the more difficult it is to cordon it off effectively. The very nature of nuclear experiments is such that, to the extent that adequate safety measures are taken by cordoning off areas of the high seas, universally accepted customary rules of international law are violated as the ships of all nations have the right to sail on the high seas and no state may interfere with freedom of navigation on the high seas.

Every State has the right to sail ships under its flags on the high seas as the open sea is the common highway for the ships of all nations. Freedom of navigation on the high seas is open to the ships of all States and therefore no State is permitted to commit any acts on the high seas which might adversely affect the use of the high seas as a highway by the ships of any other state. It is in the interest of free intercourse and communication between States that the principle of the freedom of the open sea has become universally recognised and must be upheld. The doctrine of the freedom of the open sea is recognised by all authorities on international law as a fundamental principle of the law of nations. This Committee is of the opinion that insofar as the tests necessitate creation of danger zones, they interfere with the freedom of navigation. This may also amount to exercise of sovereignty by the State creating danger zones over the open seas which clearly is not permissible. The investigations of Japanese scientists have proved beyond doubt that the nuclear tests cause destruction and contamination of fish and other living resources of the sea. It is a fundamental principle of international law that all States have the right for their nationals to engage in fishing on the high seas and no State may be prevented from exercising this right to fish on the high seas in time of peace. Fisheries on the open sea are open to the vessels of all nations and no State may by unilateral action prevent the nationals of other States from enjoying the living resources of the high seas. In 1953, a few months before the Bikini tests, the International Law Commission expressed the opinion that "it may be contrary to the very principle of freedom of the seas to encourage or permit action which amounts to an abuse of a right and which is apt to destroy the natural resources whose preservation and common use have been one of the main objects of the doctrine of the freedom of the seas. The interference with the interests of other nations in fishing on the open sea is a clear violation of one of the fundamental principles of the law of the sea, namely, the right of all nations to fish on the high seas which, in the words of Fauchille, is "eternally open to all the nations."

In the light of the foregoing discussion, the conclusions reached by this Committee are as follows :—

(1) Conducting of nuclear tests, as such, may not offend any principle of international law if they do not result in harm or damage.

(2) Scientific evidence as available, however, shows that every nuclear explosion caused by testing of nuclear weapons results in widespread damage and is capable of doing such damage ; that in the present state of scientific development it is impossible to eliminate the possibility of harmful effects of such tests ; such harmful effects not only cause direct damage and destruction but pollute the atmosphere and cause fall-out of radioactive material and also increase atomic radiation which is detrimental to the well being of man and affects also future generations.

(3) Having regard to the harmful effects, as shown by scientific data, a State which carries out the nuclear tests must be held to be carrying on a dangerous activity. Even if such activities are carried on within the territory of the 'testing State' they amount to an abuse of the State's right in regard to the use of its own territory. The plea of justification on the ground of self-preservation ought not to be accepted.

(4) The principle of absolute liability well recognised in all civilised legal systems for harbouring dangerous chattels or carrying on of dangerous activities ought to be applied in international law as a part of its progressive development, and a State carrying on nuclear tests ought to be made liable for the damage caused by such tests on the basis of general scientific evidence without the necessity of further proof of actual damage.

(5) Since scientific evidence shows that everynuclear weapon test causes damage, a State carrying on such activities should be held to be guilty of internationally wrongful conduct for the wrongs or injuries caused thereby to other States and its nationals without further proof of damage.

(6) Having regard to the scientific evidence a testing State must be said to violate the principles contained in the United Nations Charter and the Declaration of Human Rights, and at any rate the spirit behind them.

(7) Nuclear tests carried on on the high seas violate the principle of the freedom of the seas in as much as the carrying on of such tests interfere with the freedom of navigation and they result in pollution of the water and destruction of the living resources of the sea.

(8) A State carrying on such tests in Trust Territories must be held to be acting contrary to Articles 73 and 74 of the United Nations Charter.

VII. COMMENTS OF DELEGATIONS AND MEMBER STATES ON THE DRAFT REPORT ON LEGALITY OF NUCLEAR TESTS

Comments of Delegations and Member States on the Draft Report on Legality of Nuclear Tests

JAPAN

The major part of the Draft Report from page 195 to page 219 is based on the background paper prepared by the Secretariat. The Committee, however, did not discuss the matter in such detail either at its Fourth or Fifth Session.

Therefore, the Japanese Delegation hold that the said part of the Draft Report should be treated separately as a working paper provided for by the Secretariat, and that the Draft Report should merely mention the fact that the Committee discussed the topic on the basis of the working paper. Such being the position of the Japanese Delegation, expressions like "The Committee is of the opinion that ...." should be omitted from such working paper for they do not necessarily reflect the views of the whole Committee.

In the event that the above-mentioned part of the Draft Report is to be adopted as the Report of the Committee, the Japanese Delegation will be obliged to reserve their position with regard to any and all parts of such Report.

2. The Japanese Delegation consider that the Report of the Committee should make it clear that the Committee, while it has agreed on the importance of humanitarian consideration or political aspects of the question of cessation of nuclear weapon tests, has decided to devote its work at the present session to the question of legality of nuclear weapons tests.

3. Theoretically viewed, the problem of legality of nuclear tests should be distinguished from the problem of compensation for loss or damage by nuclear tests. The Japanese Delegation hope that the Draft Report be drawn up in precise knowledge of such distinction.

4. The Japanese Delegation hold that a State that has carried out nuclear tests should incur a strict liability for actual loss or damage caused by them under the general principles of law recognised among civilised nations, whether or not *dolus* or *culpa* can be attributed to the testing State. The very occurrence of actual

less or damage, however, should be established by the claimant State. The idea to shift the burden of proof from the claimant to the testing State in regard to the existence of such loss or damage, which in effect makes the testing State to prove the non-existence of any loss or damage by nuclear tests, poses a most difficult legal question because, although quite interesting *lege ferenda*, such an idea would necessitate an extreme expansion of the theory of strict liability now recognised in the civilised society and would result in a general change to the traditional doctrine of procedural equality between the parties (*Prinzip der Waffengleichheit*).

5. In this connection, "actual damage" should include all kinds of biological effects so long as they are medically predictable. And *lege ferenda*, the genetic effects should also be regarded as "actual damage" if scientific evidence can show that the future occurrence of the genetic effects is highly probable. And again *lege ferenda*, if the genetic effects have actually appeared at a later period, they will be regarded as new damage for which compensation can be claimed.

6. The Japanese Delegation hold that the scientific evidence made available to the Committee shows that the radioactive contamination of the earth's environment caused by the nuclear tests results in increases in the global levels of radioactive fall-out and thus constitutes a growing threat to the present and future generations, and also that such radioactive fall-out could become harmful when accumulated.

Therefore, the Japanese Delegation hope that the Draft Report should state clearly that the cumulate nature of radioactive fall-out causes or is capable of causing the harmful effects to the world-wide environment.

7. In the light of the position stated above, the Japanese Delegation would like to propose the following amendments to specific passages of the Draft Report.

(1) At page 197 delete "as to whether scientific evidence did establish that the nuclear tests have harmful effects on the human beings," and insert "as to whether scientific evidence did establish that *all* nuclear weapons tests have harmful effect on human beings."

(2) Delete the part on page 198 beginning with "in the absence of....." and ending by "..... have harmful effect", and substitute "in as much as no factual and scientific evidence to the contrary *has been made available before the Committee*, it would be reasonable to proceed on the basis that nuclear weapons tests cause or are capable of causing harmful effects."

(3) On page 199 delete "rather than rely on principle of international law."

(4) On page 218, in paragraph (4) of the conclusions, delete the words "on the basis of...." and substitute "on the basis of scientific evidence."

(5) On page 218 amend paragraph (5) of the conclusions to read as follows :

"(5) Without prejudice to paragraph (1) of the conclusions, nuclear weapons tests constitute internationally wrongful conduct for the damage or injuries caused thereby to other States and their nationals."

(6) On page 218, amend paragraph (6) of the conclusions to read as follows :

"(6) A nuclear weapon test is to be considered as a infringement upon the principles contained in the United Nations Charter and the Declaration of Human Rights, and at any rate upon the spirit behind them."

(7) On page 219, amend paragraph (7) of the conclusions to read as follows :

"(7) To carry on nuclear weapons tests in the high seas constitutes an abuse of right so long as the carrying on of such tests interfere with the freedom of navigation and fishery on the part of other nations."

THAILAND

1. The Delegation of Thailand finds the Draft Report on Legality of Nuclear Tests prepared by the Secretariat of the Asian-African Legal Consultative Committee inacceptable as a whole.

2. The Delegation of Thailand finds it possible to accept only one part of the Draft Report from page 216 beginning with the phrase "The next question to be considered...." to page 217.

3. The conclusions reached in the Draft Report are not acceptable to the Delegation of Thailand, which can only accede to paragraphs 1, 7 and 8 of the Conclusions as they now stand.

4. It is the view of the Delegation of Thailand that it is not possible to give a conclusive legal opinion on the legality of nuclear tests without examining all the scientific evidence including materials referred to by the testing States, particularly on underground tests.

5. Subject to amendments, paragraph 2 of the Conclusions may be accepted by the Delegation of Thailand :

(*i*) After the opening phrase "scientific evidence as available and "to the Secretariat".

(*ii*) The word "impossible" at the beginning of the fifth line should read "not yet reasonably practical".

6. The Delegation of Thailand is of the opinion that a large portion of the Draft Report which leads to the conclusion in paragraph 4 is labouring under misapprehension that there is as yet no liability under international law for the damage or injuries caused by nuclear tests. International law has already developed far beyond that stage and the Thai Delegation is prepared to support as a proposition of international law that the testing State is liable to pay compensation to the injured State in respect of damage to properties or loss of lives or physical injuries. This liability is eminently under the heading of State responsibility or sub-heading "private claims" or "international claims". There is no need to go into the history of the development of international law on this particular topic. But if trace must be made, it can be made to the

common law concept of nuisance as illustrated by the *Trail Smelter Award*, or the theory of absolute liability, or the maxim "*sic utere tuo ut alienum non laedas*", which incidentally is separate from and unconnected with the notion of abuse of right in international law. Paragraph 4 should be redrafted to read :

> "The testing States are liable to pay prompt and full compensation to the injured State or States in respect of damage caused by nuclear tests under the modern international law doctrine of State responsibility."

7. Paragraph 3 of the draft Conclusions is not acceptable to the Thai Delegation for two reasons : (*i*) Reference to the doctrine of "abuse of right" is not helpful to the discussion, because it has very little connection with the problem of nuclear tests. The only accurate reference to "abuse of right" is found in page .. of the Draft Report in a quotation from an opinion given by the International Law Commission — (*ii*) Reference to the plea of justification on the ground of self-preservation is irrelevant. The right of individual and collective self-defence is expressly provided in Article 51 of the Charter of the United Nations.

8. Paragraph 5 of the draft Conclusions is not acceptable to the Thai Delegation for the following reasons :

(*i*) It is supported by the lack of evidence to the contrary, while in fact evidence to the contrary has not yet been examined. Damage need not necessarily follow.

(*ii*) Nuclear tests resulting in damages are actionable. They are not *injuria sine damno* or actionable without proof of damage. In international law, damage cannot be assumed, because of the complicated problem of "nationality of claim". If nuclear tests are actionable *per se*, it would not be possible to recognise who the injured party is and how the compensation is to be assessed. Confusion would be introduced into the theory and practice of international law.

(*iii*) Actionability is still remote from illegality or criminality. Civil wrongs or tortious acts are not the same as wrong-

ful conduct or illegal act or criminal offence. The idea of illegality has not yet fully developed in international law. It is nevertheless closely linked to the concept of legal control of State acts.

9. The Delegation of Thailand is predisposed to accept paragraph 6 of the draft Conclusions, if it can be so amended as to read :

"Having regard to the potential harmful effects of nuclear weapon tests, the testing of nuclear weapon explosions may be said to violate the principles of human rights and fundamental freedoms contained in the Preamble of the Charter of the United Nations and the Universal Declaration of Human Rights."

10. It is the view of the Delegation of Thailand that the question of legality of nuclear tests cannot be discussed separately or divorced from the question of legal controls of nuclear tests. Nor can it be said that one is more political than the other. Legal controls of nuclear tests are exclusively legal questions from the point of view of international law just as legal controls of international conflicts are purely juridical in the eyes of Professor Julius Stone. The creation of an international machinery to control nuclear tests, once a conclusion is reached that such tests are potentially dangerous although not necessarily always illegal, is no more political and no less a legal question for an international lawyer than the creation and functioning of an international tribunal to control international conflicts or to settle international disputes.

It is therefore the submission of the Delegation of Thailand as a Member of this Committee that legal aspects of the legal control of nuclear tests should be studied together with the examination of further evidence on the effects of nuclear tests, as it is inseparably bound up with the question of legality of nuclear tests.

UNITED ARAB REPUBLIC

Extracts from the letter dated 7th May, 1962 of H.E. Hafez Sabek, Head of the U.A.R. Delegation to the A.A.L.C.C. and Chief Justice of U.A.R. addressed to the Secretary, A.A.L.C.C.

In response to your letter dated March 28th, 1962, I recall that the U.A.R. Delegation had accepted at the Rangoon Session the Draft Report prepared by the Secretariat on the subject of "Legality of Nuclear Tests". The Delegation stands still on its position but reserves his rights to express further views on the comments which the other delegations may send to the Secretariat.

CEYLON

The statements made by very many of the Delegates at the Rangoon Session during the discussion of the Legality of Nuclear Tests took the form of answers to specific questions, which had been posed in the Brief prepared by the Secretariat. What are set out, at the end of the Draft Report, in the form of "conclusions reached by the Committee", purport to be summaries of the opinions expressed by the Delegates in answer to those questions. For the reason that this summary does not adequately give expression to certain doubts and reservations contained in some of the statements rendered at the Session, the Delegation of Ceylon, while stating its general agreement with the conclusions as set out in the Draft, reserved the right to make the comments which we now offer.

As a general observation, we consider that the Report, as drafted, does not contain adequate indication of the distinction, underlined by many Delegates, between the humanitarian and practical considerations which render imperative the condemnation of nuclear testing on the one hand, and the considerations which, on the other hand, affect the different question of the legal validity of such tests. We consider that any effectiveness which the Committee's conclusions may have will be enhanced, rather than reduced, if it is realised that this distinction was borne in mind during the discussions.

The Committee, consisting, as it does, solely of personnel experienced in the practice, teaching and administration of Law, had necessarily to be guided by opinions of other authorities on the question whether nuclear tests are inherently dangerous to human and other life. On the basis of material collated by the Secretariat,

our Delegation thought it reasonable to assume that the fact of such danger had been quite satisfactorily established by past experience. Nevertheless, the Committee did not have the advantage of hearing "the other side" with respect to this vital question of fact. Hence we cannot be certain that the assumption of necessary and inevitable danger is completely justifiable. If tests *can* be conducted without any risk of danger to life, the basis for the condemnation of the Tests *on the ground of illegality* would no longer exist.

In regard to the legal bases for the conclusion that nuclear tests are illegal or ought to be illegal (with which conclusion our Delegation agrees) we are aware that there have been arguments put forward by students of international law in favour of a view contrary to that reached in the Report. The value to be attached to the Committee's Report would have been enhanced if these contrary views could have been examined.

We consider that the ground of "justification" for the conduct of the tests may be somewhat more substantial than the treatment of the matter in the Draft Report would indicate. Had the question of legality to be considered *in limine, before any actual tests had been conducted*, the possible plea of justification (*i.e.*, that tests may be necessary as a measure of preparation for defence in anticipation of nuclear attack), could have been ruled out as being quite untenable. To have ruled it out at that stage, antecedently to the commencement of testing, would have meant only that all States would be in a position of equality in the matter of preparation for defence, and that in the event of hostilities each State would equally lack the advantage of the use of tested weapons. But *unfortunately*, the validity of the plea of justification has to be considered in different circumstances, in the light of the unhappy fact that tests have actually been conducted by some States, one or some of which may already enjoy a potential offensive superiority in consequence. A particular State may in all reason and sincerity be fearful or even convinced that some other State has, through tests which have already taken place, perfected a weapon for future use, and may therefore desire to conduct tests only with a view to the equalisation of offensive strength as a measure of defence. In such a context, we cannot with full confidence adhere to the conclusion that the plea of justification must at this stage be rejected without

qualification. So to reject it would amount to perhaps unreasonable condemnation of the motives by which the nuclear States are at present influenced.

For similar reasons, it is difficult to agree fully with the conclusion that nuclear testing, by reason of the risk involved to the nationals of the testing State itself, violates the principles of the Charter and the Declaration of Human Rights. If indeed a State conducts tests in good faith in the interests of its defence as a measure of protection *against tested weapons* believed to be within the possession of other States, it would be doing so in the interests of its nationals. Such a State would be faced with the difficult choice of endangering its nationals by the conduct of tests or else of exposing its nationals to the risk of possible nuclear attack with no assurance of protection in such an event. We consider that at the least there is room for difference of opinion on the question whether a State which in such a situation chooses to conduct tests can be said to be acting prejudicially to the human rights of its nationals. Here again, the fact that an unlawful act has already been done by another State would appear to raise considerations similar to those upon which the law of self-defence is based, and to render justifiable a course of action which might in other circumstances have been indefensible.

The Draft Report indicates the intention of the Secretariat to append the statements made by the Delegates of their opinions on the several questions posed for consideration at the Rangoon Session. We do not therefore think it necessary to mention in the present comments certain less important points upon which our Delegation's opinions are not precisely in accord with the "conclusions' as set out in the Draft Report.

PAKISTAN

Extracts from the Letter No. F. 23 (1)P/62-III dated December 18, 1962 from Mr. Mohd. B. Babar, Third Secretary, Pakistan High Commission, New Delhi, addressed to the Secretary, A.A.L.C.C.

I am desired to refer to your letters No. F. (Res.)12/62(1) dated April 24, 1962, and F. (Res.)-12/62(4) dated October 20, 1962, regarding the comments of the Government of Pakistan on the

Draft Report on Legality of Nuclear Tests, and to state that the Government of Pakistan are in agreement with the views contained in Paras 3 to 8 of the conclusions reached by the Committee.

INDIA

I. *General Observations*

The Government of India are generally in agreement with the conclusions reached by the Committee on this subject. However, it is suggested that the Report should also deal with the question as to whether an injunction for stoppage of nuclear tests is necessary. This indeed is a very important question, for, the question of reparation comes only after the event and it is no solution to the real issue which is to save humanity and property from damage and destruction. The International Court of Justice has the power to indicate, if circumstances so require, provisional measures which ought to be taken to preserve the respective rights of either parties. (See Article 41 of the Statute of the International Court of Justice). If occasion arises for the International Court of Justice to consider this question, we think that the Court will not hesitate to issue a suitable order of injunction. In this connection, we would also like to draw the attention of the Committee to the statement of the Delegate of India when this subject was discussed at the Fifth Session of the Committee. We would therefore suggest that a paragraph on the subject may be included in the Final Report.

II. *Other Comments*

Injury or harm to human beings resulting from nuclear tests may be either instantaneous or delayed. Though the Report deals with this question, the conclusion merely refers to the harmful effects resulting from the nuclear explosions.

It is suggested that the conclusions appearing on pages 217 to 219 of the Report may be redrafted as follows :—

(1) The available factual data and the result of scientific research establish beyond doubt that every nuclear explosion caused by testing of nuclear weapons is capable of causing damage to human life and health as well as to property by its blast, heat, toxicity and radioactive fall-out ; such damage may be instantaneous or

delayed ; the extent of actual and possible damage might vary according to the magnitude of the explosion. The possibility of damage can neither be controlled nor predicted.

(Reference may be usefully made in this connection to the Nagasaki and Hiroshima incidents and after, the explosion at Bikini and the various works recording scientific researches).

(2) As the nuclear explosion, the harmful effects of which are neither predictable nor controllable, is likely to cause wide spread and large scale damage, a State which carries out or permits the carrying out of nuclear tests must be held to be indulging in or permitting a dangerous or ultra-hazardous activity.

(3) The liberty of a State to carry on any activity, however dangerous, on its territory is based on the theory of absolute sovereignty. But it is recognised in international law that a State shall not knowingly use or allow its territory to be used for acts which affect the other States. (See the *Corfu Channel Case* and the *Trail Smelter Case*).

(4) The theory of absolute sovereignty of a State has also received a setback by the modern developments in the international sphere which preclude a State from acting in a manner detrimental to the interests of the other States.

(Reference is invited to the Preamble of the Charter of the United Nations, the Universal Declaration of Human Rights, the views of the International Military Tribunal of Nuremberg, Conventions on the Law of the Sea, Genocide Convention etc.).

(5) Accordingly, nuclear tests, potentially capable of causing harm to other States and their nationals, cannot be justified on the accepted principles of international law and usage—at any rate having regard to the modern trend in the development of international law and usage.

(6) The plea of justification for nuclear tests on the ground of self-preservation cannot and ought not to be accepted as no State can claim to cause harm to other States, without provocation, in its effort to preserve itself.

(7) A State carrying on nuclear tests on its territory is unquestionably guilty of an international tort and is liable for the damage caused thereby to other States and their nationals. The liability of the State should be absolute or strict—without proof of fault or negligence.

(8) An action for injunction restraining a State from carrying on nuclear tests would probably succeed in the International Court of Justice.

(9) Nuclear tests carried on in the High Seas violate the principle of the freedom of the seas inasmuch as the carrying on such tests interfere with the freedom of navigation and they result in pollution of the water and destruction of the living resources of the sea.

(10) A State carrying on such tests in trust territories must be held to be acting contrary to Articles 73 and 74 of the United Nations Charter.

VIII. DRAFT ARTICLES ON NUCLEAR TESTING

Submitted by the Delegation Of Ceylon at the Sixth Session

Draft Articles on Nuclear Testing

Article I

It shall be unlawful for a State to cause damage, direct or indirect, to aliens, whether on its territory or outside its territory and whether in respect of person or property, by the explosion of nuclear weapons by testing. The State causing such damage shall incur international responsibility to the national State or States of the injured aliens involving the duty to make reparation to the latter State or States.

Article II

It shall be unlawful for a State to cause damage, whether direct or indirect, to another State, whether on the territory of the former or outside it, by the explosion of nuclear weapons by testing. The State causing such damage shall incur international responsibility to the injured State involving the duty to make reparation.

Article III

It shall be a violation of the sovereignty of the State by another where the latter causes damage on the territory of the former by the explosion of nuclear weapons by testing and the latter shall give satisfaction for this to the former.

Article IV

(*a*) The question whether an explosion of nuclear weapons by testing has caused particular damage shall be answered by determining whether the damage was the probable consequence of the explosion of the nuclear weapons concerned.

(*b*) Such damage shall be presumed to be the consequence of the test carried out.

(*c*) Such presumption may be rebutted by proof beyond reasonable doubt that in view of the precautions taken by the State concerned the damage was not caused by the explosion caused by it.

Article V

It shall be no defence to any of the unlawful acts enumerated in Articles I to III that the damage caused was unforseeable or that

reasonable care was taken to avoid such damage provided such damage is the natural consequence of the explosion of the nuclear weapons concerned.

Article VI

It shall be no defence to any of the unlawful acts enumerated in Articles I to III that the damage caused was the result of the pollution of the high seas by such explosions.

Article VII

It shall be no defence to any of the unlawful acts enumerated in Articles I and III that the explosion of nuclear waeapons was carried out in circumstances in which preparation for self-defence against nuclear attack was called for by the prior explosion of nuclear weapons by another State.

Article VIII

Where two or more explosions of nuclear weapons by more than one State cause damage but it is uncertain how much of the damage was caused by each State, there shall be a presumption that each of these States is jointly and severally liable for all such damage. This presumption may be rebutted by proof that any one State was responsible for a specific portion of the damage only.

Article IX

The quantum of damages payable for any unlawful damage for which a State is responsible shall be determined in accordance with the rules of international law, deriving from any relevant source of international law, pertaining to the qualification of damage.

Article X

The persons on whose behalf claims may be brought by a State shall be determined in accordance with the rules of international law, deriving from any relevant source of international law, pertaining to the bringing of such claims.

Article XI

Passage through the territorial sea of a State shall not be innocent where such passage involves the carriage of nuclear weapons without the permission of the littoral State.

Article XII

An injunction should be granted in appropriate cases at the instance of any State whose nationals are likely to be injured against an imminent threat of an explosion.

IX. FINAL REPORT OF THE COMMITTEE

Adopted at the Sixth Session

Final Report of the Committee

The Asian-African Legal Consultative Committee at its Third Session held in Colombo in January 1960 decided to take up for consideration the question of Legality of Nuclear Tests, a subject which had been suggested by the Government of India under article 3 (c) of the Statutes of the Committee, being a legal matter of common concern to all the states participating in the Committee.

At its Fourth Session held in Tokyo, in February 1961, the Secretariat of the Committee presented before it the relevant material both from the scientific and legal points of view, which formed the basis of discussion at that session. After a general discussion the Committee decided to study the matter further and to take up the question for fuller consideration at its Fifth Session. The Committee decided that it would not concern itself with the question regarding the use of nuclear weapons in time of war, but that it would confine itself to an examination of the problem of the legality of nuclear tests in time of peace.

In accordance with the decision taken by the Committee at its Tokyo Session, the Secretariat prepared a report which was placed before the Committee at its Fifth Session held in Rangoon in January 1962, on the basis of which the matter was further considered.

The Committee heard the views and expressions of opinion on the various topics arising on this subject from the Members for Burma, Ceylon, India, Indonesia, Japan, Pakistan, Thailand, and the United Arab Republic. Thereafter further comments were submitted by member governments.

At the Sixth Session of the Committee held in Cairo, in February-March 1964, the Committee considered the report prepared by the Secretariat and the comments received from Governments. The Committee took into account the various United Nations resolutions and international agreements relevant to the subject and the scientific data placed before the Committee. It also noted with satisfaction the conclusion of the Treaty of 5th August, 1963 prohibiting nuclear tests, which has had a considerable effect upon the ultimate outcome of the Committee's deliberation.

The Committee has formulated the following conclusions, stating that they apply equally to test explosions of nuclear weapons carried out by anyone for whose action the State is responsible in international law.

CONCLUSIONS

1. As sufficient evidence regarding the harmful effects of the underground test explosions of nuclear weapons is not at present available to the Committee, the Committee is unable at this stage to express any opinion on the legality or otherwise of such test explosions. The conclusions hereainafter set out are therefore referable to all test explosions of nuclear weapons other than underground test explosions.

2. Scientific evidence examined by the Committee shows that every test explosion of nuclear weapons results in widespread damage, immediate or delayed, or is capable of resulting in such damage; the present state of scientific knowledge does not indicate that the harmful effects of such test explosions can reasonably be eliminated. Such test explosions not only cause direct damage, but pollute the atmosphere and cause fall-out of radioactive material and also increase atomic radiation, which are detrimental to the well-being of man and also affect future generations.

3. Having regard to its harmful effects, as shown by scientific data, a test explosion of nuclear weapons constitutes an international wrong. Even if such tests are carried out within the territory of the testing State, they are liable to be regarded as an abuse of rights (*abus de droit*).

4. The principle of absolute liability for harbouring dangerous substances or carrying on dangerous activities is recognised in International Law. A state carrying out test explosions of nuclear weapons is therefore absolutely liable for the damage caused by such test explosions.

5. Test explosions of nuclear weapons are also contrary to the principles contained in the United Nations Charter and the Declaration of Human Rights.

6. Test explosions of nuclear weapons carried out in the high seas and in the airspace there above also violate the principle of the freedom of the seas and the freedom of flying above the high seas, as such test explosions interfere with the freedom of navigation and of flying above the high seas and result in pollution of the water and destruction of the living and other resources of the sea.

7. Test explosions of nuclear weapons carried out in trust territories and non-self-governing territories also violate Articles 73 and 74 of the United Nations Charter.

APPENDICES

APPENDIX I

Effects of Atomic Radiation on Man and his Environment

(Extracts from the *Report of the United Nations Scientific Committee on the Effects of Atomic Radiation*)

CHAPTER III (vi)—"*Environmental Contamination*"

38. Radioactive contamination of man's environment occurs as a result of nuclear explosions and may also arise from radioactive waste disposal and accidents involving dispersion of radioactivity. At the present time, the radiation doses from these last two sources are negligible, but in the future they might become appreciable.

Radioactive fall-out

39. Most of the radioactive isotopes which cause the environmental contamination following nuclear weapon tests are fission products. There are also some formed by neutron induction and some residual fissionable material.

Fall-out mechanisms

40. Fission products injected into the stratosphere constitute a reservoir from which they fall on to the whole of the earth's surface over a period of many years (stratospheric fall-out). Fission products not penetrating into the stratosphere may be transported over long distances in the troposphere by air currents but are deposited on the earth's surface by rainfall and sedimentation over a priod of a few months (tropospheric fall-out). Because of the gradual deposition of fall-out from the stratosphere, most of the resulting irradiation of man arises from radioactive isotopes of long half-life such as strontium-90 and caesium-137. In contrast, the earlier deposition of tropospheric fall-out makes it necessary also to consider the doses from radioisotopes of much shorter half-life such as strontium-89, zirconium-95 and ruthenium-103 and 106, iodine-131, barium-140, and cerium-144.

41. Near the test site there is an early deposition of radioisotopes which is influenced by various meteorological and testing conditions and which may involve a special hazard to any individual in this area of immediate local fall-out.

42. Meteorological conditions and the predominant occurrence of nuclear tests in the northern hemisphere cause a non-uniform deposition of the longer-lived isotopes over the globe, as a result of which countries between 30° and 50° North experience a deposition of these about three times as great as the world-wide average. Countries in the southern hemisphere and in the tropical belt have smaller deposits with a maximum between 30° and 50° South, of the order of the world-wide average value D18. In some countries, tropospheric fall-out increases the deposition of the longer lived isotopes strontium-90 by a small amount. Local meteorological and climatic factors influence the extent and mode of the deposition in a particular locality.

Measured contamination of air and ground by strontium-90 and caesium-137

43. Results of measurements of strontium-90 and caesium-137 concentrations in different materials show an average air concentration at ground level of strontium-90 of the order of 10^{-19} to 10^{-17} c/l in 1956-1957 D-10/11. Values for strontium-90 deposited on the ground at the middle of 1957 were about 8mc/km² in Japan, 8mc/km² in the United Kingdom, 4-21mc/km² in the United States and 3-12mc-km² in the Soviet Union, in the northern hemisphere, and about 4mc/km² in Argentina, in the southern hemisphere. At the middle of 1957 a caesium-137 deposit about 6mc/km² was measured in Japan and Sweden.

Uptake of radioisotopes

44. Radioisotopes enter the human body by inhalation of airborne material and more particularly by ingestion following (a) uptake by and deposition on vegetation, (b) transfer through animals, (c) contamination of water supplies. In this respect strontium-90, caesium-137 and iodine-131 are of special importance. The particulate nature of fall-out and the occurrence of single particles with an activity higher than the average might result in the intake, by a single individual, of an amount of radioactive material exceeding that calculated on the assumption of uniform distribution of the fall-out deposit. The relative importance of the various modes of intake must, however, be considered in assessing the significance of this.

CHAPTER V (iv)—*"Summary and Conclusions"*

62. A large body of knowledge has accumulated during the last sixty years on the somatic effects of ionizing radiations on man and animals. This knowledge has come from numerous observations on human beings and from extensive experimentation with laboratory animals. In both cases, the effects of external and internal radiation have been studied and, although many of these effects are far from being understood in all details, our knowledge is sufficient to provide a general picture of the events that occur after human beings and animals have been exposed to ionizing radiations of all kinds. In general, the effects following exposure to relatively large doses are well known, whereas the effects of small doses are not understood nearly as well.

63. All types of ionizing radiations produce similar biological effects; these are usually not distinguishable from other pathological conditions. Some radiations, such as neutrons and alpha rays, are more efficient in producing certain types of somatic effects. Physical factors of exposure such as dose, dose rates and dose distribution are as important in determining the nature and extent of the biological effects as are the age and sex of the individual exposed and the part of the body that has suffered exposure. Radioactive isotopes produce harmful effects in those organs in which they are selectively retained. The extent of these effects depends on the physical characteristics of the isotopes, such as on the half-life, and the type and energy of the radiations emitted as well as the time of retention in a particular organ and the sensitivity of that particular organ to radiation injury. Absorption of measurable quantities of radioactive materials in human beings and animals has been demonstrated in recent years. Strontium-90, having a half-life of 28 years and being deposited selectively in bone, may be cited as an example to which particular attention must be given.

64. Exposure to relatively large doses of external or internal irradiation produces a variety of characteristic and well-known somatic effects which may occur either immediately or with a delay of a few days to several years. Certain organs, such as the blood-forming organs, the skin and the gonads, are particularly vulnerable to injury by ionizing radiations. Many of the actue effects, such as erythema of the skin and radiation sickness follow-

ing whole body exposure have characteristic threshold doses. Similar thresholds exist for acute blood and bone disorders following ingestion of large amounts of radium and other radioactive materials.

65. The tissues of the embryo and foetus are among the most sensitive to radiation. Malformations and other pathological conditions have been observed following exposure of pregnant women to accidental and therapeutic irradiation and to diagnostic procesdures, e.g. pelvimetry. Experimental work has demonstrated that radioactive materials, such as strontium and other soluble radionuclides circulating in the blood of the mother, can be absorbed and deposited in foetal organs, such as the skeleton, where they may produce lesions.

66. As the dose of radiation is reduced below the amounts giving rise to acute functional or morphological alterations, the reactions of the organism become more difficult to detect immediately and the effects may be progressively delayed in time. Thresholds are not easily revealed under these conditions of exposure, in fact, for some of the most delayed phenomena, it is uncertain whether they exist.

67. It is a very characteristic feature of radiation injury that delayed reactions may occur many months or years following exposure. The morphological and functional alterations which occur during the long periods of latency are poorly understood. It has been shown that even after such periods acute manifestations of somatic effects may develop. Among the late effects, leukaemia, bone cancer and other malignant changes are worthy of mention. It has been demonstrated that whole-body exposure can shorten the average life span of experimental animals, and it is possible that the same may be true for man.

68. Small doses of radiation given repeatedly can have a cumulative effect in those cases in which the proceses of recovery and compensation are limited. It is not known whether sensitization occurs. The existence of adaptation in the broad biological sense of the term has not been proved.

CHAPTER VI—"*Conclusions*"

35. It is accepted that radiation-induced mutations are, in general, harmful and increase in direct proportion to the genetically significant exposure, even at very low dose levels; and that a dose of between 10 and 100 rads per generation would probably be required to double the natural mutation rate in human populations. About 4 per cent of all births are affected with hereditary disorders, some one-quarter of which appear to be at least largely determined by single gene differences. On this basis, an increase in the mutation rate would eventually result in a directly proportional increase in a part of this 4 per cent amounting to more than one quarter but less than the whole of it. In addition, there would be some changes in other hereditary characteristics of a less sharply defined nature, but the probable extent of these and their importance cannot be assessed at the present time. The Committee concludes from the foregoing genetic facts that exposures to ionizing radiation should be reduced wherever possible, and that medical and industrial procedures tending to increase radiation levels to which human populations might be exposed should be carefully weighed as to such benefits or hazards as each may have.

CHAPTER VII—"*Summary and Conclusions*"

1. In estimating the possible hazards of ionizing radiation, it is clearly necessary to know both the levels of such radiation received by man and his environment from various sources, and the present and future effects likely to be produced thereby. It is of particular importance to assess the effects of radioactive fall-out from nuclear weapons, since this source of general environmental contamination is of recent origin, and has led to concern in the minds of many people. All sources of radiation must, however, be reviewed for a complete evaluation of the situation.

2. The Committee, aware of the complexity of this task, knows that our present information about radiation levels and effects is inadequate for an accurate evaluation of all hazards, and that many of the estimates will necessarily be approximate or tentative.

Radiation from fall-out

16. Fall-out from nuclear weapon tests causes radiation exposure in several ways. Exposure of the world population results

from the slow fall-out of fission products which have been distributed in the stratosphere. Exposures also result from any fall-out from the radioactive "cloud" which passes through the troposphere without having reached the higher stratosphere, and from the fall-out which may occur in areas adjacent to weapon tests or within some thousand kilometres of them.

17. We also consider the ways in which fall-out material causes irradiation to different parts of the body, to people on different diets or under different agricultural conditions, and to people of different ages; and the change in the amounts of radiation that would result from altered or unaltered rates of injection of radioactive materials into the stratosphere.

Fall-out adjacent to tests

18. The early fall-out of radioactive materials near to the sites of nuclear explosions, which is influenced by various meteorological and testing conditions, may cause high radiation exposure to individuals within these areas. The amount of such radiation exposures varies very greatly with the weapon tested, with the height of firing, with the distance from the point of explosion, with the direction of winds at various altitudes and with the chance occurrence of rainfall through radioactive material in the early hours after the test. Therefore, at present, these doses cannot in general be calculated. Under very special conditions, high radiation exposure and deleterious effects have been reported, as in the cases of the Marshall Islanders and the crew of a Japanese fishing vessel. Not enough information is available as to the general circumstances in which such local deposition may occur, and the extent and duration of the exposures liable to be involved.

Fall-out from the troposphere

19. Radioactive materials injected into the atomsphere below the tropopause (at about 14 km) are brought down to the earth's surface by rainfall and sedimentation. This process takes a few months during which they are carried several times around the world. This tropospheric fall-out consists of a mixture of radioactive materials, most of which are short-lived isotopes. At the present time, the tropospheric fall-out is deposited intermittently, during the year and a certain deposit of short-lived activities is built up and maintained. When appropriate factors for shielding and

weathering effects are included, the gonad and average marrow dose from this deposit, as an external source, is calculated to be about 0.5 mrem per year.

20. Transient increases of the doses from tropospheric fall-out have been observed in limited areas shortly after weapon tests. These transient increases may give rise for a few days to dose rates of the order of those from natural sources.

21. The radioisotopes of tropospheric fall-out may be taken up into the body by inhalation and ingestion. Since the radioisotopes of principal concern are short-lived, storage of the contaminated food products reduces the dose which they contribute. The gonad dose over the whole population from inhaled and ingested tropospheric material is negligible as compared with the contribution from this material as an external source. The average bone marrow dose from internal sources is about 0.2 mrem per year.

22. Increases in radioactivity of the thyroid gland have been found during periods of several weeks or a few months following weapon tests. In human thyroids a dose from iodine-131 of about 5 mrem per year has been estimated for 1955-56 in the United States excluding areas immediately adjacent to weapon test sites. Doses of this order are unlikely to cause detectable damage or functional change in the gland.

23. Irradiation of bone may result from incorporation of intermediate and short-lived fission products. Although these materials do not cause prolonged irradiation, they may become selectively concentrated into those areas of bone in which active growth is taking place at the time, and so cause more intense radiation locally than if the same amounts of these materials were distributed throughout the whole skeletion.

24. The Committee has insufficient information on local variations and temporary increases of tropospheric fall-out in populated areas at different distances from weapon test sites, and emphasizes the lack of further data which would permit evaluation of the biological significance of this source of environmental contamination.

World-wide fall-out from the stratosphere

25. Radioactive materals injected into the stratosphere, especially by high-yield nuclear explosions, constitute a reservoir from which they fall on to the whole of the earth's surface for many years. The rate of fall-out varies with latitude and is greater in the northern hemisphere, where most of the tests are carried out. Within any given small area, fall-out rate may also vary with local meteorological conditions. The radiation due to stratospheric fall-out from weapons exploded so far will contribute a 30-year gonad dose of 10 mrem, and a 70-year *per capita* mean marrow dose of 160 mrem and 960 mrem for two populations deriving most of their dietary calcium from milk and rice respectively.

26. Owing to the relatively gradual fall-out from the stratosphere, most of the subsequent radiation is due to two radioactive isotopes of slow decay, other fission products already having largely undergone decay. These two radioactive isotopes are caesium-137 and strontium-90. The physical properties and chemical behaviour of the two differ.

27. Caesium-137 is responsible for most of the gonad radiation from fall-out. When it is taken into the body, it becomes distributed more or less evenly throughout the tissues, causing uniform irradiation of the whole body; and when present in the surroundings, its penetrating gamma radiations cause a similarly uniform irradiation of tissues.

28. Strontium-90, on the other hand, is not a gamma-emitter and does not contribute significantly to the irradiation of any part of the body from without. However, on being taken into the body, it becomes incorporated in bone because of its chemical similarity to the normal bone-forming element calcium. This similarity with calcium and selective concentration in bone raises problems which do not occur with caesium-137.

29. The average concentration of strontium-90 in the bones of children, in whom new bone is continuously being formed, is higher than in adults whose bones were largely formed before the environment, and consequently the food supply became contaminated with strontium-90. The highest concentrations of strontium-90 in bone have in fact been observed in children from a few months

to five years old. The bone marrow exposures from fall-out are due to the strontium-90 content of bone and refer to the concentrations estimated for children of these ages. The corresponding exposures of bone cells from fall-out are, on the average, about three times the values for bone marrow. Marrow cells almost enclosed by bone would receive doses similar to those in compact bone. The maximum marrow dose could differ by a factor of about 5 from the average level.

30. The radiostrontium concentration in bone is also affected by dietery habit and by the ratio of the amounts of strontium-90 to calcium in the diet. At present this ratio differs in various dietary constituents; it is higher in brown rice than in white, somewhat higher in many vegetables than in milk products, higher in rain-water than in river water, and lower in sea fish than in fresh water fish.

31. Agricultural conditions may also affect the content of strontium-90 in the diet, since the available calcium of the soil will, within certain limits, influence the ratio of strontium-90 to calcium in crops derived from the soil. The distribution of soils which are highly deficient in calcium and their utilization require further study. More work is also needed to understand the distribution of strontium-90 in the soil, its chemical availability in plants and uptake through their roots, its behaviour under ploughing and the leaching of it from soil by the action of water.

Since the figures in table I for future strontium-90 levels in bone are calculated on the assumption that this material will not be leached from soil, and this assumption may lead to unduly high values.

32. Bone marrow exposures from fall-out are given in table I for two conditions : one based on observations in the United States of America and the United Kingdom, where milk is the main source both of dietary calcium and of strontium-90, and where soil calcium contents are commonly high; and the other based upon data from Japan where milk products are much less used and where rice and other vegetable products form the main source of dietary calcium and strontium-90, and where low calcium soils are frequent. These two estimates demonstrate the present range of known dietary contaminations. They will be used in an attempt to estimate the

hazard of radiation from fall-out in paragraph 57 below, when the nature and frequency of the biological effects of radiation have been considered.

33. It is evident that the radiation exposures from fall-out which are most likely to be of significance are :

(*a*) Those from short-lived fission products and radioactive material due to local or tropospheric fall-out;

(*b*) Those of the gonads and other organs from caesium-137 due to stratospheric fall-out ;

(*c*) Those of bone and adjacent tissue from strontium-90 which also comes largely from the stratosphere. The relative importance of these contributions varies from region to region.

Biological Effects of Radiation

34. The biological effects of ionizing radiation are exhibited in different ways according to whether isolated cells, tissues, organs or organisms are examined. In passing from unicelluiar to higher organisms, the primary physico-chemical consequences of radiation become increasingly influenced by secondary effects due to the reactions of the organisms to the primary events. Detailed knowledge of these reactions is needed for a full understanding of the results and mode of action of radiation. The following paragraphs deal first with the cellular effects of radiation; then with the somatic effects on the irradiated individual and with the genetic effects on his progeny.

35. The effects of ionizing radiations on living matter are extremely complicated, and their exact mechanisms are still largely unknown. The initial disturbance is associated with ionization (and excitation) of molecules which lead to alterations in their properties. Many functions of the cell are thus affected by radiation, and, although some specific effects may be caused by one or a few events in the cell, many are probably the combined result of numerous such events.

36. The minimum doses causing certain detectable biological effects differ very much in different organisms, but for most mammals they are of about the same magnitude, so that the results of experiments on such animals can, as a first approximation, be applied to man. The sensitivity of different tissues to radiation

varies considerably, however. Our knowledge of the biological effects of low radiation levels is meagre because of experimental difficulties and the lengthy observations necessary to obtain results in this field. At present, opinions as to the possible effects of low radiation levels must be based only on extrapolations from experience with high doses and dose rates.

Effects of radiations on man

37. Man may prove to be unusually vulnerable to ionizing radiations, including continuous exposure at low levels, on account of his known sensitivity to radiation and the end of the period of reproduction.

38. Embryonic cells are especially sensitive to radiation, and some evidence suggests that exposure of the foetus to small doses of radiation may result in leukaemia during childhood. Irradiation of pregnant mammals has shown that doses exceeding 25 rem to the foetus during certain stages of its development can cause abnormalities in some organs. Some embryonic cells (neuroblasts) of certain species cultivated *in vitro* respond to doses as small as 1 rad. If these results should be applicable to man and since they relate to the development of the brain, the opinion seems justified that even a very small dose to the human foetus may involve some risk of injurious effects if received during a critical period of pregnancy. Radiostrontium must be expected to enter foetal bone when calcification starts in the second trimester of pregnancy, and so cause irradiation of the adjacent developing nervous system and hypophysis with exposures ranging upto that occurring in the bone. The uptake of radiostrontium in foetal bone tissue is, however, at present very small, contributing less radiation than 1 per cent of that due to natural sources; but if the present rate of test explosions is continued, it will rise ultimately to some 10 per cent of that due to natural sources.

39. Children are regarded as being more sensitive to radiation than adults, although there is little direct evidence on this subject, except for an indication that cancer of the thyroid may result from doses of a few hundred *rad* which do not induce this change in adults.

40. In human adults it is difficult to detect the effect of a single exposure to less than 25 to 50 rem, or of continuing exposure

to levels below 100 times the natural levels. The first sign of radiation damage to the blood forming tissues seems to be a drop in the number of lymphocytes and platelets and the appearance of abnormalities such as bilobed lymphocytes.

41. Rapid but transient disturbances have been observed in mammals after exposure to a single dose of 25 to 200 mrem. Appropriate biochemical and physiological techniques have, however, only recently been applied to the study of irradiated organisms, and have not yet given a clear picture of what happens to organisms irradiated with small doses or dose rates. Too few mammalian species have hitherto been studied in this respect, and there is a clear need to widen this basis, from which inferences can be drawn concerning man.

42. Processes of repair play an important role in the final outcome of radiation damage. They are one cause of the existence of a threshold dose (or dose rate) characterized by the fact that this dose or greater ones produce a particular biological effect which does not appear when the dose is less than the threshold. In the latter case, physico-chemical events have occurred, but recovery processes have prevented the final appearance of biological damage. Threshold doses are found for some somatic effects, such as erythema of skin. Other forms of radiation damage to cells, tissues or organisms, however, appear to be cumulative; for instance, mutational damage, once established, is not repaired.

43. Damaged cells or tissues may be eliminated and replaced by regenerated normal cells, this process being most active in embryos and young animals and in certain tissues of the adult. The affected cells may also re-establish apparently normal biochemical functions. During the process of regeneration of tissues damaged by radiation, malignant tumours may be induced.

44. The power of repair differs considerably in different organisms and types of cells, and varies to a high degree with the physiological conditions. No chemical treatment has yet been discovered which will induce or accelerate recovery from radiation damage in man. The grafting of blood-forming tissue has so far been successful only in small mammal irradiated with a lethal dose to the whole body, and no attempt to apply this treatment to irradiated man has yet been reported.

45. Prevention of the effects of radiation is rendered more difficult, and complete protection against it impossible, because changes which already occur during the irradiation lead to later damage. The discovery of chemical protectors, although important theoretically, has not yet yielded methods which appreciably reduce radiation damage in man. At present, effective protection from external radiation sources can only be achieved by adequate shielding or by keeping at a safe distance from the source. Much work is in progress on the effect of certain (chelating) agents in discharging from the body radio-isotopes incorporated there, and so diminishing exposure to internal radiation.

46. Morphologically recognizable damage may be induced by total or partial, continuous or intermittent irradiations much in excess of the currently accepted "maximum permissible levels" of occupational exposure. Such damage includes leucopenia, anemia and leukeamia. Other pathological conditions such as cataract, carcinoma of the thyroid, and bone sarcoma are known to have resulted from partial body irradiations, but with rather high doses involving hundreds or even thousands of rem given to these organs.

47. The shortening of the life-span in small rodents exposed to large doses has suggested the possibility that certain degenerative processes may be aggravated by continued exposure to low radiation levels. Such a shortening has also been inferred from an analysis of the published death rates of United States radiologists compared with those of certain other groups of medical men. However, studies in the United Kingdom have failed to demonstrate such an effect.

48. Present uncertainty about the effects of low dose levels makes it imperative that as much relevant information as possible be collected about groups of persons chronically exposed at these levels and for whom adequate control groups exist, for instance, certain populations in areas of high natural radiation and workers in uranium mines.

49. Exposure of gonads to even the smallest doses of ionizing radiations can give rise to mutant genes which accumulate, and are transmissible to the progeny and are considered to be, in general, harmful to the human race. As the persons who will be affected,

will belong to future generations, it is important to minimize undue exposures of populations to such radiation and so to safeguard the well being of those who are still unborn.

50. The present assumption of the strictly cumulative effect of radiation in inducing mutations in man is based upon some theoretical considerations and a limited amount of experimental data obtained by exposure of experimental organisms to relatively high dose levels. This assumption underlies all present assessments of the mutational consequences of irradiation. Therefore, extension of the experimental data to the lowest practicable dose levels is needed.

51. The knowledge that man's actions can impair his genetic inheritance, and the cumulative effect of ionizing radiation in causing such impairment, clearly emphasize the responsibilities of the present generation, particularly in view of the social consequences laid on human populations by unfavourable genes.

52. Besides increasing the incidence of easily discernible disorders, many of them serious but each compratively rare, increased mutation may affect certain universal and important "biometrical" characters such as intelligence or life-span. In this way, it is possible that continued small genetically significant exposures of a population may affect, not only a correspondingly small number of individuals seriously, but also most of its members to a correspondingly small extent. While less easy to detect, this second kind of effect on a population could also be serious. Unfortunately, the great majority of the genes affecting the "biometrical" characters are not individually detectable and so can only be studied collectively and with difficulty. In consequence, far less is known about them than about genes responsible for individually detectable changes and very little indeed about their response to irradiation, even in the best studied experimental organisms. Hence it is impossible, at the present time, to estimate with any assurance the effect upon biometrical characters of any given level of irradiation of human populations. Much further research throughout this field is therefore needed.

Legal Problems in the Use of Radiation Sources

(Extracts from the *Proceedings of the International Conference on the Peaceful Uses of Atomic Energy, Geneva*, 1955.)

PUBLIC LIABILITY

There has been considerable discussion, particularly among lawyers, concerning the matter of civil liability for radiation damage and much speculation concerning the liability rules which will apply in the event of an atomic accident. It is reasonable to assume that the utilisation of atomic energy will raise unique problems but it is difficult to conceive of any which cannot be resolved within the framework of existing legal systems. It is equally difficult to assume the answers, and the principles of legal responsibility which will prevail must await the facts and practicabilities of particular cases. There are, however, certain precedents in the law which by way of analogy indicate future issues which may arise.

Liability of owners and operators of facilities

An accident causing public damage will raise the issue of strict liability, or liability without fault, under which proof of negligence is unnecessary. In 1866, the English Court of Exchequer first announced the doctrine that one "who for his own purposes brings on his lands and collects and keeps there anything likely to do mischief if it escapes, must keep it at his peril, and, if he does not do so, is *prima facie* answerable for all the damage which is the natural consequence of its escape."

In affirming, the House of Lords limited the use of the rule to situations involving a "non-natural" use of the land (*Rylands* v. *Fletcher*, L.R. 3 H.L. 330 (1868) affirming L. R. 1 Ex. 265 (1866). The doctrine is incorporated in the *American Restatement of the Law of Torts*, which recognises the general rule that there is no liability for 'unintentional and non-negligent" conduct even where harm results, but announces a single class of exceptions for so-called "ultra-hazardous activities." Section 159 states that: ".....one who carries on an ultra-hazardous activity is liable to another whose

person, land or chattels the actor should recognise as likely to be harmed by the unpreventable miscarriage of the activity for harm resulting thereto from that which makes the activity ultra-hazardous, although the utmost care is exercised to prevent the harm."

This concept of strict liability has been applied to the storage of explosives, to blasting, and to ground damage from aviation. Its extension to damage from radiation caused by escaping fission products, in those countries which accept the doctrine, would seem to be consistent with the generalised rule of ultra-hazardous activities.

It is, however, far from clear that one could support a general statement that strict liability will be applied in all cases of atomic accidents. Much will depend on technological developments, on the availability of insurance permitting the risk to be spread, and on prevailing social values, particularly where the operation involved is for the benefit of the public generally and is essential to the good of the State as a community. There are, furthermore, certain legal defenses which might succeed—the fault of the plaintiff, intervention by a third-party, acts of God, normal or ordinary use of the land, and statutory authority. The latter two may well prevail in the typical fact situation which can be hypothesized. The English Courts themselves have excluded absolute liability where the activity in question was "merely.....the ordinary use of the land or such a use as is proper for the general benefit of the community. (*Richards* v. *Lothian*, (1931) A. C., 263 (P.C.)] and it has been indicated that the manufacturer of explosives in wartime may be an "ordinary user" (see *Read* v. *Lyons*, (1945) K. B. 216, 240 (C. A. 1944). Legislative permission to conduct an activity has the same effect as "natural user." In *Northwestern Utilities Ltd., v. London Guarantee & Accident Co.*, 154 L. T. R. 89 (P.C. 1936), the rule of strict liability was held inapplicable to a utility company whose gas escaped into a basement and exploded, on the ground that the company located and used its pipes in accordance with statutory permission. *A fortiori* if, in addition to statutory authority, a defendant could show that his activities in all respects were conducted in accordance with official regulations and standards.

The presence of the State as a party in any litigation due to the ownership of the reactor fuel will raise additional questions relating

to (a) the scope of the State's liability—compare Section 2(1)(c) of the British Crown Proceedings Act (10 & 11 Geo 6, c. 44) which imposes governmental liability absolutely by reason of the ownership or control of an extra hazardous instrumentality with Section 410(a) of the United States Federal Tort Claims Act which apparently requires a "negligent or wrongful act or omission" of a government employee; and (b) liability for discretionary acts—see *Dalehite* v. *United States*, 346 U. S. 15 (1953), relieving the United States Government from liability in connection with the Texas City disaster by reason of the discretion and policy decisions involved in the Government's ammonium nitrate fertilizer programme.

If it should be required that proof of negligence is a condition to the imposition of liability, there is a further principle in tort law which will benefit a plaintiff and ease the problems of proof; namely, the principle of *res ipsa loquitur*. Basically, this doctrine, which applies when the cause of the injury or damage is under the sole control of a defendant and experience indicates that the accident causing the harm will not happen if due care is exercised, permits the drawing of inferences of negligence from a mere recitation of the occurrence. It has been applied in a variety of circumstances—an unexplained explosion in a power factory, boiler explosions, unexplained airplane accidents, bursting bottles, falling ceilings—and it is quite likely that an argument will be made for application in a case involving a reactor accident. The following language from an opinion of one of our state courts in boiler case indicates the approach which may be taken:

> "Boilers sometimes explode. Comparing the number of explosions with the extent of the use of boilers, explosions are not frequent. If they are kept in proper condition and repair, and if they are operated properly, explosions are unusual. Whether the *res ipsa* doctrine, which permits an inference of negligence from the fact of an explosion, should apply is largely a question of how justice in such cases is most practically and fairly administered. There is nothing illegally illogical in permitting the inference to be drawn. Usually the party injured is without information upon which he may with certainty allege the exact cause, and is without direct proof. Perhaps the exact cause is incapable of ascertainment. The actual proof, if any, is

with the party having the management of the instrumentality. These are practical considerations. We think the jury should have been permitted to draw an inference of negligence.....from the occurrence of the 150 explosions....." "[*Kleimman* v. *Banner Laundry Co.*, 150 Minn. 515 (1921).]

This somewhat lengthy identification of a problem of civil liability has been presented only to indicate that the questions which arise are substantial and the answers not easily perceived. The facts in any case will predominate and shape the results. Special care should be taken to avoid hasty generalisations concerning the applicable rules, in order to avoid the mistakes that were made, for example, when the automobile first presented novel questions of negligence and liability.

Liability of manufacturers and suppliers

A defect in a component part of a reactor, faulty construction of reactor facilities, and the mishandling or misuse of radioactive products may cause widespread damage and present the problem of the liability of the manufacturer, constructor, or supplier to injured third persons (i.e., persons other than immediate contractors or buyers).

The general rule in the United States is that:

"A manufacturer who fails to exercise reasonable care in the manufacture of a chattel which, unless carefully made, he should recognise as involving an unreasonable risk of causing substantial bodily harm to those who lawfully use it for a purpose for which it was manufactured and to those whom the supplier should expect to be in the vicinity of its probable use, is subject to liability for bodily harm caused to them by its lawful use in a manner and for a purpose for which it was manufactured."—Restatement of Torts, S. 395.

This principle was originally discussed in terms of "dangerous substances," but has been so extended by recent decisions as to render the concept of "dangerous" practically meaningless. Now, if substantial harm can be foreseen and if the chattel is defective, the rule applies.

An extension of the doctrine in *Moran* v. *Pittsburgh-Des Moines Steel Co.*, 166 F. 2d 908 (3rd Circ. 1948) is of special interest in the atomic energy industry. Defendant, under contract with a public utility company, designed, furnished materials for, and constructed a tank on the utility's land for the storage of liquified natural gas. Thirteen months after completion and acceptance of the tank, it ruptured, releasing large quantities of gas and causing fires and explosions in which more than 100 lives were lost. An employee of the utility company engaged in work unconnected with the storage of gas was killed, and an action for wrongful death was brought against the builder of the tank. The court held the defendant liable for negligent defects in manufacture to one who might reasonably be expected to be in the vicinity of the chattel's use and, also, that the principle applied even though the tank when installed technically became part of the structure and land of the utility company.

The decision is important in that it includes within the rule not only manufacturers of equipment but building contractors as well, and presumably defective design and engineering.

In any case, however, according to prevailing authority there must be proof of negligence. Attempts to extend the doctrine of strict liability to manufacturers of articles or equipment which proves to have a defect that causes injury have not as yet met with much success; but it can be expected that this new principle of liability will be advanced in cases of injury or damage due to reactor break-down. Acceptance will depend upon the courts and circumstances.

The commercial dstribution of radioactive products will also present liability problems. Modern case law holds the manufacturer liable for injury due to inherently dangerous articles marketed without the necessary cautionary statements. A danger is inherent when it derives from the nature of the article itself, as opposed to dangers resulting from a defectively made article that is ordinarily harmless. Negligence attaches not to the manufacturing, but to the distributing and marketing process and is founded on the failure to give proper instructions and warning.

The very good chance that the defenses of contributory negligence and assumption of risk will present recovery in most cases arising out of the distribution of raidoactive products may inspire the

argument that strict liability should attach in order to stimulate standards of conduct needed to protect the public. Using as analogy the statutory liability imposed with respect to foods, drugs and cosmetics, it may be advanced that when the distribution of radioactive products is subject to control through licensing and regulations proof of a violation of the regulations and the conditions of the license will constitute conclusive evidence of negligence. Here, again, we merely identify the nature of the problem and do not presume to supply the answers.*

*There are other legal problems which might be mentioned: Since radiation injury may not become apparent for some time, statutes of limitations may have to be changed for special treatment afforded for such injuries. International transportation of materials and a catastrophic incident causing widespread damage over a large geographical area may raise questions of jurisdiction and the choice of law. A "mass" tort may present procedural questions. For problems related to workman's compensation, see Greene, "*Workmen's Compensation Aspects of the Peaceful Use of Atomic Energy*, P/323. Session 4.3, Vol. 13, these Proceedings.

APPENDIX III

The Effects of Radiation and an Assessment of the Hazards of Exposure to Radiation

(Extracts from *The Hazards to Man of Nuclear and Allied Radiations*, Medical Research Council, H.M.S.O., London, 1958)

The future development of civilisation is bound up with the exploitation of nuclear energy. Its use, like that of other sources of energy, entails risk, but the risk is controllable and, within limits, can be accepted. It is the scale and not the nature of the hazard that is new, for human populations have always been exposed to natural radiation of low intensity.

THE NATURE OF RADIATION AND ITS ACTION ON LIVING CELLS

Ionizing radiations are so described because they cause the formation of electrically charged particles, ions, in the matter through which they pass. The common types of penetrating radiation are X-rays, gamma rays, alpha and beta particles, and neutrons. Alpha particles cannot penetrate tissue beyond a fraction of a millimetre but gamma rays, and X-rays produced by extremely high voltages, can traverse the whole body.

The biological effects of radiation are related to the intensity of radiation and to the period of exposure. The basic unit of radiation dosage which has been generally used is the roentgen (r). All living tissue can be killed if exposed to sufficiently high doses of radiation. The effects of dosages below those which damage tissues irretrievably may be modified by processes of healing, so that the response to a dose of radiation which is spread over a long time may be much smaller than, or quite different from, the response which would occur if the same dose were given in a very short time. This does not apply to the important type of genetic effect, called, gene mutation, produced by the irradiation of reproductive cells, the consequences of which are cumulative and irreversible.

THE EFFECTS OF RADIATION ON THE HEALTH OF THE INDIVIDUAL

Sources of information

Our knowledge of the effects of ionizing radiations on human beings comes from four main sources: from the uses of X-rays and

radium in the treatment of disease, mainly of cancer ; from a study of the occupational hazards of medical radiologists, workers in the luminising industry, and miners of radioactives ores ; from a study of the victims of atom bomb explosions; and from experiments on animals.

The harmful effects of radiation on man

Almost all the effects of ionizing radiation on tissues are essentially deleterious. The benefits to the individual patient of the eradication of a malignant tumour by radiotherapy result from selective damage to the tumour cells. The nature and severity of radiation injury is determined by the type and dosage of radiation received, the part and extent of the body irradiated, the length of the period of exposure, and the age of the persons exposed. The harmful effects may be classified into those which develop within a few weeks of exposure, and delayed effects which may not make their appearance until many years after exposure.

Effects occurring within a few weeks of exposure

The effect of exposing the whole body to a single dose of gamma radiation of the order of 500 r is such that all the persons so exposed would develop acute illness and at least half would die. In civil life, exposure to such a dosage could occur only under the most exceptional circumstances. With smaller single doses, for example of 100 r, not more than 15 per cent of an exposed population would suffer acute illness and very few, if any, of those affected would die. After a single dose of 50 r, acute illness would be very rare. The relationship between the dose of radiation received and the effects that may be produced within a few weeks of exposure is not one of strict proportionality; with each successive and equal increment of dosage the response increases by a progressively greater amount, at least until very large changes have been produced.

The delayed effects of radiation

Delayed effects of exposure to radiation may occur at any time after the end of the second month. Disorders of the skin and underlying soft tissues and of bone may occur and there may be subsequent development of cancer. Cataracts, severe anaemias and leukaemia have been caused and there is evidence from animal experiments that exposure to radiation may cause death at a prematurely early age.

Leukaemia

Leukaemia is a disease in which there is an uncontrolled overproduction of white blood corpuscles. Experiments on animals have shown that the incidence of leukaemia is increased by irradiation. Clear evidence that the same is true of man comes from two main sources: a study by the Atomic Bomb Casualty Commission of the incidence of leukaemia in Hiroshima and Nagasaki, and a survey under our sponsorhsip of the incidence of leukaemia among patients treated by radiation for ankylosing spondylitis.

Ninety-one proven and fourteen suspected cases of leukaemia have been recorded in Hiroshima and Nagasaki between 1947 and 1954 among those present at the time of the explosion and still resident in the cities; the expected incidence in an unexposed but otherwise comparable population is twenty-five. The difference is greater than would be attributed to chance. Moreover, there was a much higher frequency of occurrence among those who had developed early acute radiation illness and among those who had been nearer to the centre of the explosion. The latent period, that is the average length of the period between the explosion and the first appearance of symptoms of leukaemia, was about six years. The evidence suggests that with this type of exposure to radiation the likelihood of developing leukaemia, after its initial rise, remains approximately constant up to at least the ninth year.

Ankylosing spondylitis is a disease in which the joints, particularly those of the spine, progressively lose their freedom of movement. In the treatment of this condition very extensive areas of the body are exposed to irradiation. The records of between 13,000 and 14,000 patients, who had been treated with X-rays between 1933 and 1954, have been studied. Up to 1955, thirty-eight of these patients developed leukaemia, an incidence which, although only about one-third of one per cent, is about ten times greater than the normal expectation. No increased incidence of leukaemia was found among 400 patients who had not been treated for irradiation, but the number is too small to exclude completely the possibility that ankylosing spondylitis may of itself predispose its sufferers to leukaemia ; nor can the possibility be excluded that these patients are more liable than the average person to develop leukaemia after irradiation. Nevertheless, there is clear evidence of

a correspondence between the dosage of radiation received and the incidence of leukaemia. The average length of the latent period between the first exposure to X-rays and the diagnosis of leukaemia was about six years.

The conditions of exposure to radiation in Hiroshima and Nagasaki, and in the treatment of ankylosing spondylitis, are not comparable with the irradiation in small doses over long periods which might be received by persons engaged in work with a possible radiation hazard. Some evidence has been presented suggesting an increased death rate due to leukaemia among radiologists but our knowledge of the occurrence of leukaemia under conditions of chronic exposure is too scanty to allow any reliable conclusions to be drawn.

Cancers

Two characteristics of cancers induced by radiation are noteworthy: the tendency of tumours to arise in tissues already severely damaged by radiation, and the long latent period, twenty years or more, before they appear.

A study of the pitchblende miners of Schneeberg and Joachimsthal suggests strongly that inhalation of the radioactive gas radon may lead to cancer of the lung. The latent period has been put at seventeen years and the dosage to the lungs over that period at about 1000 r and in some parts of the lung much higher. In theory, the inhalation of radioactive particles in the fall-out from atomic explosions or in the vicinity of nuclear reactors could also lead to cancer of the lung, but the former hazard is extremely unlikely in peacetime, and steps are always taken to ensure that the latter does not occur.

Radium, mesothorium, plutonium and radioactive forms of strontium are accumulated by and retained in bone. Until the enforcement of stringent controls, cancer of bone occurred among workers in the luminising industry as a result of swallowing radium-containing paint. The latent period was more than fifteen years.

Cancer of the skin was the earliest form of radiation-induced tumour to be described in man. By 1911, before the adoption of modern safeguards, fifty-four cases had been described among the

pioneers of radiology. The doses of radiation which have led to the formation of skin cancers must have been several thousand r.

Cancer of the thyroid gland in children has been a sequel to irradiation of the neck for enlargement of the thymus gland. This form of cancer is distinguished by its short latent period (about 7 years) and the comparatively low dosage of radiation required to induce it. However, it is not unlikely that other factors are involved here in addition to the direct effect of irradiation.

Other delayed effects

A fall in the number of red cells and white cells in the blood may follow exposure of the whole body to even moderate doses of gamma radiation. If not detected in time a condition known as aplastic anaemia may occur.

Cataract formation is known to have been caused by neutron irradiation, but for all practical purposes the production of cataract by X-rays is not an occupational hazard.

Delayed effects of radiation on the skin extend from a temporary loss of hair after local dosages of 300r-400r to severe and permanent damage after local exposure to single dosages of 1550r or more, or to repeated doses totalling 4000r or more in a number of weeks. It is in the skin damaged by these higher doses of radiation that tumours, when they occur, are most likely to develop.

Miscarriage and stillbirth may be a consequence of irradiation during pregnancy, but they do not constitute a problem unless the dose of radiation is large. A number of different developmental abnormalities have been described in the children of women treated by irradiation during pregnancy, the most conspicuous defect being microcephaly, a partial failure of the development of the brain. Eleven cases so classified are recorded in children irradiated before birth in Hiroshima and Nagasaki.

The Genetic Effects of Radiation

The assessment of the genetic effects of ionizing radiations is subject to special difficulties. We believe that we have formed as fair an assessment as is possible in the light of present knowledge, but our conclusions must be regarded as provisional.

The material basis of heredity

The physical determinants of heredity are genes, carried on chromosomes in the nuclei of cells. Chromosomes are present in pairs; one member of the pair is of maternal origin, the other of paternal origin. There are twenty-four pairs of chromosomes in human beings; the number of genes is not known, but may well be many thousands.

The two genes which occupy corresponding positions on the two chromosomes of a pair are spoken of as alleles of each other. Alleles of different kinds arise by the process of mutation and are thereafter reproduced faithfully in their altered form.

Some genes produce the same effect whether they are paired with like or with unlike alleles. Such genes, and the characters they determine, are described as dominant. Other genes produce a noticeable effect only when paired with similar alleles; these, and the characters they determine, are described as recessive. There is every gradation between these two extremes. A recessive gene can be transmitted in a family by an individual who gives no signs of carrying it.

Sex difference is determined by a special pair of chromosomes, and the genes carried on these chromosomes are said to be sex-linked.

So far as is known, all genes are subject to mutation, and mutation occurs spontaneously all the time at a very low rate. Factors influencing mutation appear to affect only the frequency with which it happens. New alleles of harmful effect are eliminated by natural selection until equilibrium is reached with the rate at which they are introduced by fresh mutation. Recessive alleles are eliminated much more slowly than dominant alleles.

Basic principles of the genetic effects of radiation

There is little direct knowledge of the genetic effects of ionizing radiations on man, but with certain reservations it is justifiable to draw upon our knowledge of the effects of radiation on other organisms.

Ionizing radiations have genetic consequences only in so far as they affect the reproductive cells or the cells ancestral to them

in the reproductive organs (gonads). Two kinds of effect may have genetic consequences; the chromosomes may be damaged or the genes may be caused to mutate more frequently. Chromosome changes of the kind that can persist are only rarely produced by long continued exposure to X-rays or gamma rays of low intensity. They are likely to be a comparatively unimportant radiation hazard.

It is the frequency of gene mutation that is increased by radiation; there is no evidence and little likelihood that radiation produces entirely new kinds of genes. The rise in mutation rate is probably directly proportional to the amount of additional exposure to radiation, and any additional exposure, however small, must be expected to raise the mutation rate, if only by a minute amount.

Damage to genetic material is cumulative and irreparable. Long continued exposure to radiation of low intensity induces as much gene mutation as a single exposure to an equal dosage of radiation of higher intensity.

The age-distribution of those exposed to radiation has an important bearing on the future consequences of its effects. The genetic consequences of the irradiation of individuals beyond the age of reproduction are of course nil.

Effect of increased mutation on the incidence of disease in human populations

The rule of heredity in the production of disease range from that of a predisposing to that of a preponderating cause. The effects which might be expected to result from an increase in mutation rates can most easily be calculated for diseases known to be caused by single genes, but for relatively few such diseases have we sufficient evidence of the kind upon which such a calculation must be based.

Achondroplasia, haemophilia, and phenylketonuria have been taken as examples of diseases believed to be caused by single genes. If the mutation rates of these genes were to rise to, and remain at, twice their present values, the incidence of the disease for which they are responsible would ultimately, though at very different rates, rise to nearly twice their present frequencies. Calculations suggest that the incidence of achondroplasia, a dominant form of dwarfism, would rise 80 per cent above its present value in a single

generation; haemophilia, a sex-linked disease, would take about six generations to rise by 90 per cent in frequency; and phenylketonuria, a recessive disease associated with severe mental deficiency, would take more than fifty generations to increase its frequency by one half.

Mental diseases, the most important single category in which hereditary causes are known to be important, account in all for nearly half the hospital beds provided in this country. There are grounds for believing that a doubling of the mutation rates of the genes concerned with their causation would, in one generation, increase the frequency of low-grade mental deficiency by three per cent, and of the two principal types of mental illness, schizophrenia and manic depressive reaction, by about one per cent. If the mutation rates were to remain at twice their present values, the incidence of mental diseases might on the most pessimistic assumption double also, but would only attain this value after very many generations.

When all serious illnesses with a hereditary element in their causation are taken into account, it is unlikely that the burden put upon society by a doubling of mutation rates would exceed by more than a few times the contribution made by the increase of mental disease.

It must be remembered that a harmful recessive gene gives no outward evidence of its presence until chance brings it together with another of its kind. The crop of newly mutated recessive genes caused by an increase of mutation rates could cause suffering over many generations.

Hereditary traits showing continuous variation about the normal

Most of the variation between human beings is not of the sharp kind that can be traced to the action of single genes. Characters such as physique, intelligence and length of life vary over a wide range by imperceptible gradations, and the hereditary portion of this variation is believed to be due to the combined action of many genes.

The basic effect of an increase in mutation rates upon such characters, here exemplified by scores in intelligence tests, will be

to increase the numbers of the more extreme types at the expense of the more average individuals. A doubling of the mutation rates for a few generations would be expected to have only the most trivial effect upon their variation. The effect of a permanent doubling of the mutation rate would be, at most, to double the variation, and this would take hundreds of generations to achieve.

Observations on populations exposed to radiation

Three direct studies have been made on the children of human beings who have been exposed to ionizing radiations. Two, on the children of American radiologists, were for a variety of reasons inconclusive; the third is the extensive study made by the atomic Bomb Casualty Commission on the children of those who were in Hiroshima and Nagasaki when the atomic bombs exploded. All three studies are limited to observations on the first generation, so that little genetic effect would yet have become manifest even if the mutation rate had increased.

The evidence assembled in the report of the Atomic Bomb Casualty Commission is beset by many difficulties of interpretation, but we believe that it reveals, in the children of those who were the more heavily exposed, a slight but significant change in the sex ratio at birth which might be due to genetic damage. From the nature of the evidence a doubling of the rate of incidence of congenital malformations, or a 50 per cent rise in the stillbirth rates, might have escaped detection if either had occurred. The evidence does not allow us to make any useful estimate of the radiation dose which doubles the mutation rate in man.

The 'doubling dose' in man

An assessment of the sensitivity of human genes to radiation is particularly difficult. Any such estimate should be based upon a sample of genes large enough to be representative of all the effects they exercise, for it cannot be assumed that all genes are equally radio-sensitive, nor that the proportion of the spontaneous mutation rate which can be attributed to natural radiations is the same for different genes.

If all mutations were indeed due to radiation, then the dosage which doubled their frequency would be expected to be equal to that received from natural sources, namely, a dosage to the gonads

of about 3 r in thirty years. The available evidence suggests, however, that the percentage of human mutations that are caused by natural radiation might lie between 2 per cent and 20 per cent, and if this is so the doubling dose will lie between 15 r and 150 r.

The direct estimates which have been made of the doubling doses for a variety of plants and animals mostly run from 24 r upwards. It is true that none of the more fully investigated organisms has a lifetime comparable with man's, but there are theoretical grounds for believing that the organisms with the longer pre-reproductive periods might be expected to have the less radiosensitive genes.

The evidence at our disposal, though far from adequate, leads us, to conclude that there is rather little likelihood that the real value for the doubling dose for human genes lies between 3 r and 15 r; and that, although we cannot exclude the possibility that for some human genes the doubling dose may be less than 30 r and for others more than 80 r, the best estimate that we can make in the light of present knowledge, is that the value in general lies somewhere between 30 r and 80 r.

Even if the doubling dose were as low as the minimum we can reasonably entertain, namely 15 r, it is extremely improbable that in times of peace more than a small fraction of the population could receive an extra dose of this size. The prevalence of naturally-occurring hereditary abnormalities is such that, if comparatively few individuals received such a dose, there would be no noticeable effect on their immediate offspring or on their descendants even over several centuries. For levels of radiation up to the doubling dose, and even some way beyond, the genetic effects of radiation are only appreciable when reckoned over the population as a whole, and need not cause alarm to the individual on his own account.

Existing and foreseeable levels of exposure to Radiation

Doses of radiation which are of no known significance to the individual may have genetic consequences. Exposure levels must therefore be expressed in terms of the total dosage to the gonads received by the population as a whole during the period of reproductive life.

Radiation from natural sources

The natural sources of radiation are cosmic rays and the naturally-occurring radioactive elements. From all such sources an individual in this country receives, on the average, a total gonad dose of about 3 r over a priod of thirty years.

Radiation from the appurtenances of civilisation

Over the past sixty years man has made increasing use of X-rays and radioactive materials in medicine, industry, and ordinary civil life. The additional gonad doses received from these sources by poeple of this country are expressed as percentages of the gonad dose which they already receive from natural sources.

We have conducted a limited survey which suggests that the additional dose received from the various forms of diagnostic radiology may well be higher than 22 per cent, the major amount of which is accounted for by examination of a relatively few sites of the body. The contribution made by the use of radiation in medical treatment cannot be accurately estimated; it is probably much less than that made by diagnostic radiology but greater than that received from any other artificial source.

Watches and clocks with radioactively luminous dials contribute about one per cent of additional radiation. X-rays from television sets account for much less than one per cent. The contribution from X-ray apparatus used in shoe-fitting is not likely to exceed 0.1 per cent.

The contribution arising from the work of the Atomic Energy Authority is the most accurately known, and is about 0.1 per cent. A study of the records of the National Radiological Protection Service has put the contribution from other occupational sources at about 1.6 per cent.

Contamination of the world by fall-out from the explosion of nuclear weapons

Continual watch is kept by the Atomic Energy Authority on the radioactive fall-out reaching this country from nuclear devices exploded in other parts of the world. From the bombs exploded up to the present time, the population of this country may expect to receive, over the next fifty years, additional radiation amounting

to between 0.02 per cent and 0.04 per cent of the radiation which will be received over the same period from natural sources.

If the firing of bombs were to continue indefinitely at the same rate as over the past few years, radioactivity would gradually accumulate to a level at which an inhabitant of this country would receive an average dose of 0.026 r over a period of thirty years, or about one per cent of that which he would receive in the same period from natural sources.

The contribution of this figure from thermonuclear explosions, relative to their numbers, is very great. If the rate of firing of weapons of this type increases, exposure to radiation will be significantly raised.

Special hazards of radioactive fission products

It is unlikely that the inhalation of radioactive particles present in the air as a result of fall-out would constitute a problem in ordinary civil life.

The deposition of radioactive strontium is probably a greater hazard, because it is soluble and, if ingested, is deposited and retained in bone. Measurements which have been made of radioactive strontium in bone show that the highest levels are at present about a thousand times less than is considered permissible for those who are occupationally exposed.

Atomic war

Atomic bombs were developed for their capacity to create blast, but for persons exposed in the open that heat flash is equally to be feared. The ionizing radiations produced immediately after explosions have a much greater penetrating power than the heat rays, but the range at which they cause death or immediate injury is somewhat less. The hazard from radiations is therefore only one of the immediate effects of atomic explosions. Their peculiar danger lies in their distant and delayed effects.

Assessment of the Hazards of Exposure to Radiation

An attempt is made to assess the medical and genetic consequences of exposure to radiation at the levels of dosage which occur now or which might conceivably come about. The naturally occurring

level of radiation can be accepted as a standard of reference, because it is a level to which mankind has long been adjusted.

In considering the genetic effects of radiation, we are concerned with the sum, over the whole population, of the total gonad dose received by its members from conception until the end of reproductive life.

In considering the effects of radiation upon the individual, we are concerned with his whole span of life, and with the rate at which the radiation is received as well as with its total dosage; and we must have regard to the possibility that the severity of the effects produced by radiation may increase in more than equal proportion to the dosage that is received.

Dosage and effects on the individual

The acute effects of radiation which appear within two months of exposure to a single dose or a few heavy doses do not enter into ordinary civil calculations; nor is it feared that they may be produced by repeated exposures to doses that do not exceed 0.3 r per week.

Of the delayed effects of irradiation of the whole body, leukaemia is probably the most easily induced. We consider that an individual could, without feeling undue concern about developing any of the delayed effects, accept a total dose of 200 r in his lifetime, additional to that received from the natural background, provided that this dose is distributed over tens of years and that the maximum weekly exposure, averaged over any period of 13 consecutive weeks, does not exceed 0.3 r. We recommend, however, that the aim should always be to keep the level of exposure as low as possible.

Dosage and genetic effects

The genetic effects of radiation are essentially problems concerning the future welfare of the population as a whole.

It follows from the nature of the genetic effects of radiation that a small fraction of population without harm to its members, receives dosages of radiation which would be likely to have serious genetic effects if applied to the population as a whole. We feel that an individual, considered as such, can accept a total gonad

dose of not more than 50 r , from conception until the age of thirty, additional to that received from the natural background, without undue concern for himself or his offspring, but that the number of such individuals should not exceed one-fiftieth of the population as a whole.

Our present knowledge does not justify us in naming any specific figure as a limit for the average dose of radiation which might be received by the population as a whole. It is highly desirable that such a figure should be named as soon as possible; and we understand that the International Commission on Radiological Protection has this matter under consideration. In the meantime, we feel bound to state our opinion that it is unlikely that any authoritative recommendation will name a figure for permissible radiation dose to the whole population, additional to that received from the natural background, which is more than twice that of the general value for natural background radiation. The recommended value may, indeed, be appreciably lower than this.

The peacetime hazards from nuclear radiation

Nuclear energy may become the principal source of power. So far as its use affects the small numbers likely to be employed in its production, we believe that nuclear energy might make power available at a lower cost in accidents, illness and disability than that incurred in connexion with other sources of power. What is novel in the use of nuclear energy and the other, increasing, uses of processes producing radiations is the genetic risk to the community as a whole. The risk from civil usage is at present small, and seems unlikely ever to be large; but from the point of view of population genetics all possible extra radiation should be avoided, and it is not now too early to suggest where we might restrain its use.

With regard to occupational exposure we consider that the record of the Atomic Energy Authority shows the standard that is attainable and the practicability of being satisfied with nothing less.

We consider that the time has come for a review of present practice in diagnostic radiology, and of certain uses of radiation in the treatment of non-malignant conditions, particularly in children.

Among the less important sources of radiation, we hope that the use of X-rays in shoe-fitting, will be abandoned except when prescribed for orthopaedic reasons; that watches and clocks with radioactively luminous dials will be confined to necessary uses; and that the X-ray hazard from television tubes, at present negligible, will be borne in mind if special types of high voltage equipment come to be widely used.

Test explosions of nuclear weapons

The genetic effects to be expected from present or future radioactive fall-out from bombs fired at the present rate and in the present proportion of the different kinds are insignificant. They might not be so, if present rates of firing were increased and particularly if a greater number of thermonuclear weapons were tested.

So far as radioactive fall-out may affect the individual, we believe that immediate consideration would be required if the concentration of radioactive strontium in bone showed signs or rising greatly beyond that corresponding to one-hundredth of the maximum permissible occupational level.

Wartime hazards

361. The area in which a greater or lesser proportion of those exposed would be at serious risk from the radioactivity released by the ground burst of a thermonuclear weapon is measured in thousands of square miles. If a sufficient number of nuclear weapons were exploded, no part of the world would escape biologically significant degrees of exposure of the load of distress and suffering to individuals and society which such exposure would entail.

APPENDIX IV

Report of the Physics Department, Faculty of Science, Alexandria University

RADIOACTIVE FALL-OUT IN ALEXANDRIA FROM NUCLEAR TESTS

Our measurements of radioactive fall-out, due to nuclear tests over Alexandria (around 3200 kms far from nuclear test site) began early in 1960. Air filtration is carried out at ground level with the aid of an air pump and a continuous air monitor. In this report we concern only with the variation of radioactive contamination of air as well as the fall-out deposited as a result of the nuclear tests. We have disregarded the measurements of radio-contamination of food and drinking water.

Figure (I) shows the air-born activity diagram. The French nuclear tests, mainly the second, the third and the fourth tests are clearly observed as peaks.

The background activity prior to the second French test was 0.1 millimicrocurie per cubic meter of air. No obvious increase in the activity of the collected samples was detected till April 11, 1960, when a pronounced increase in air contamination occurred. The radio-active 'cloud' stayed over Alexandria till May 8. During this period the activity was fluctuating, according to the meteorological conditions, and reached a peak on April 15, of about 8.5 uuc/m^3. The third French test took place on December 27, 1960. The increase of activity due to this explosion reached Alexandria on January 8, 1961. A peak of 2.62 uuc/m^3 was registered on January 16. The fourth French test contributed less activity, about 1.5 uuc/m^3 on April 30, 1961. It was worth noting that the air-born activity curve shows a real increase of air contamination just before the third and fourth French tests. These two registered excesses of contamination are of 'unknown' origin(s).

Figure (II) shows the deposited activity diagram. It is a measure of the deposited activity after the fourth French test.

As a result of these tests, the estimated activity uptake by the normal human body due to breathing during the last year is 2.5.

millimicrocurie. Moreover, the human body was exposed to an external radiation of the contaminated air estimated to be 0.04 millimicrocurie during the last year. Rough estimates show that the overall effects of contamination gave rise to an integrated radiation dosage of the order of one milli-rem unit in the last year. Fortunately, it is a small amount far beyond the maximum permissible dose of radiation.

Although the measured amount of these radiations exposed to human beings in Alexandria are really small, yet there might be very good reasons to expect some genetic effects of radiation after a long time, especially for nearer regions, but these are extremely difficult to be evaluated.

NOTE : The graphs referred to in the report—(Figures I and II)—are not reproduced.

* This report is contained in the M. Sc. thesis of Mr. E.A. Ammar to be submitted to the Physics Department. Faculty of Science, Alexandria University.