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ISRAELI NUCLEAR ARMAMENT

Report of the Secretary-General

1. By resolution 34/89 of 11 December 1979, the General Assembly, inter alia, requested the Secretary-General to prepare, with the assistance of qualified experts, a study on the Israeli nuclear armament and to report to the Assembly at its thirty-sixth session.

2. Pursuant to that resolution, the Secretary-General appointed a group of experts and submitted a progress report on the group's work (A/35/458) to the General Assembly at its thirty-fifth session. In its resolution 35/157 of 12 December 1980, the Assembly took note of the progress report and requested the Secretary-General to submit the final report to the Assembly at its thirty-sixth session. The Group of Experts to Prepare a Study on Israeli Nuclear Armament met at Headquarters in New York from 21 July to 1 August 1980, 19 to 30 January and 20 April to 4 May 1981, and in Geneva from 15 to 19 June 1981. By a letter dated 19 June 1981, the Group of Experts transmitted to the Secretary-General the study, which is hereby submitted to the General Assembly.

* A/36/150.

ANNEX

Report of the Group of Experts to Prepare a Study on Israeli Nuclear Armament

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Foreword by the Secretary-General

1. At its thirty-fourth session, the General Assembly adopted resolution 34/89 of 11 December 1979, entitled "Israeli nuclear armament", in which, inter alia, it expressed its conviction that the development of nuclear capability by Israel would further aggravate the already dangerous situation in the region and further threaten international peace and security, and requested the Secretary-General, with the assistance of qualified experts, to prepare a study on Israeli nuclear armament.

2. In pursuance of that resolution, the Secretary-General appointed a Group of Experts to Prepare a Study on Israeli Nuclear Armament and submitted a progress report on the Group's work (A/35/458) to the Assembly at its thirty-fifth session. At that session, the Assembly adopted resolution 35/157 of 12 December 1980, in which, inter alia, it took note of the progress report and requested the Secretary-General to pursue his efforts in that regard and to submit his report to the Assembly at its thirty-sixth session.

3. The Group of Experts has now completed its study, which is herewith submitted to the General Assembly for its consideration.

4. The possible introduction of nuclear weapons into the Middle East has been a long-standing concern of the United Nations. That concern is reflected in the series of resolutions adopted by the General Assembly since 1974 on the question of establishing a nuclear-weapon-free zone in the Middle East. Most recently, the Assembly adopted resolution 35/147 of 12 December 1980, in which, inter alia, it urged all parties concerned to consider taking practical steps for the establishment of a nuclear-weapon-free zone in the area and invited them to adhere to the Treaty on the Non-Proliferation of Nuclear Weapons.

5. The danger of nuclear proliferation, especially in areas of tension, is one of the world's foremost preoccupations. The establishment of arrangements by which all nuclear activities in such areas are submitted to effective and reliable international safeguards is urgently required if that problem is to be brought under control. It is to be hoped that the present report, by contributing to the world community's awareness of the urgency of this issue will help to further that goal.

6. The Secretary-General wishes to thank the experts for their unanimously adopted study. It should be noted that the observations and recommendations contained therein are those of the experts. In this connexion, the Secretary-General would like to point out that in the complex field of disarmament matters, in many instances he is not in a position to pass judgement on all aspects of the work accomplished by experts.

LETTER OF TRANSMITTAL

19 June 1981

Sir,

I have the honour to submit herewith the study by the Group of Experts to Prepare a Study on Israeli Nuclear Armament, which was appointed by you in pursuance of paragraph 6 of General Assembly resolution 34/89 of 11 December 1979.

The experts appointed by you were the following:

Mr. Ashok Kapur
Associate Professor of Political Science
University of Waterloo
Canada

Mr. Mark A. Khroustalev
Professor of the Moscow State Institute
of International Relations
Union of Soviet Socialist Republics

Mr. Ali A. Mazrui
Professor of Political Science and Director
of the Center for Afro-American and African Studies
University of Michigan
United States of America

Mr. George H. Quester
Chairman of the Government Department
Cornell University
United States of America

Dr. Assaad Saab
Senior Research Engineer
Lebanon

The study was prepared between July 1980 and June 1981, during which period the Group held four sessions, from 21 July to 1 August 1980, 19 to 30 January and 20 April to 4 May 1981 in New York, and from 15 to 19 June 1981 in Geneva.

The members of the Group of Experts wish to express their appreciation for the valuable assistance they received from members of the Secretariat of the United Nations. They wish, in particular, to convey their thanks to Mr. Hiroshi Matsumoto, Centre for Disarmament, who served as Secretary of the Group during the first two sessions, to Mr. Prvoslav Davinić, also of the Centre, who served as Secretary during the third session, and to Mr. Benjamin Sanders, Chief, Information and

Research Section, Centre for Disarmament; Mr. Irving Pfefferblit, Centre for Disarmament; Mr. Boris A. Kouvshinnikov, Director, Liaison Office of the International Atomic Energy Agency (IAEA), United Nations Headquarters; and Mrs. Merle Opelz, IAEA Liaison Office, Geneva.

I have been requested by the Group of Experts to submit to you on its behalf, its study, which was unanimously approved.

Accept, Sir, the assurances of my highest consideration.

(Signed) Ali A. MAZRUI
Group of Experts to Prepare a Study
on Israeli Nuclear Armament

His Excellency
Mr. Kurt Waldheim
Secretary-General
of the United Nations
New York

I. INTRODUCTION: CONTEXT OF THE STUDY

A. United Nations concern with the question of Israeli nuclear armament

1. Over the years, there has been increasing concern among States Members of the United Nations regarding the danger of the introduction of nuclear weapons in the Middle East, arising particularly from reports that Israel may have developed a nuclear explosive capability. This concern has emerged both in the context of widespread preoccupation with political tension and the arms race in the Middle East and of the wish to arrest the nuclear arms race in general.

2. A factor that has played a part in focusing attention on Israel's nuclear development has been the long-standing hostility in the region, which has four times erupted into full-scale war.

3. Reflecting the uneasiness on the part of Member States about a possible danger of proliferation of nuclear weapons in the Middle East, the General Assembly has adopted, since 1974, resolutions 3263 (XXIX) of 9 December 1974, 3474 (XXX) of 11 December 1975, 31/71 of 10 December 1976, 32/82 of 12 December 1977, 33/64 of 14 December 1978, 34/77 of 11 December 1979 and 35/147 of 12 December 1980, on the question of establishing a nuclear-weapon-free zone in the Middle East, in which the Assembly, inter alia, urged all parties concerned to consider taking practical steps for the establishment of a nuclear-weapon-free zone in the area and invited them to adhere to the Treaty on the Non-Proliferation of Nuclear Weapons (Assembly resolution 2373 (XXII), annex).

4. At its first special session devoted to disarmament, the General Assembly called, in paragraphs 60 to 63 (d) of the Final Document of the Tenth Special Session of the General Assembly (resolution S-10/2), for the serious consideration of the practical steps required for the implementation of the proposal to establish a nuclear-weapon-free zone in the Middle East. It further called upon States of the region to refrain on a reciprocal basis from producing, acquiring or in any way possessing nuclear weapons and nuclear explosive devices and from permitting the stationing of nuclear weapons on their territory by any third party, and to agree to place all their nuclear activities under International Atomic Energy Agency safeguards.

5. At the thirty-third session of the General Assembly, States from the Middle East region drew the attention of the Assembly to the issue of military and nuclear collaboration between some Member States and Israel, and initiated the adoption of resolution 33/71 A of 14 December 1978, in which the Assembly, inter alia, requested the Security Council to call upon all States to end all transfer of nuclear equipment or fissionable material or technology to Israel.

6. At the thirty-fourth session of the General Assembly, under the item entitled "Israeli nuclear armament" included in the agenda at the request of Iraq, the Assembly adopted resolution 34/89 of 11 December 1979, in which, inter alia, it expressed alarm "at the increasing information and evidence

regarding Israel's activities aiming at the acquisition and development of nuclear weapons", expressed its conviction that "the development of nuclear capability by Israel would further aggravate the already dangerous situation in the region and further threaten international peace and security", and requested the Secretary-General, with the assistance of qualified experts, to prepare a study on Israeli nuclear armament and to report to the Assembly at its thirty-sixth session.

7. As requested in that resolution, the Group of Experts to Prepare a Study on Israeli Nuclear Armament was appointed by the Secretary-General to assist him in preparing the study. The Secretary-General submitted a progress report on the Group's work to the Assembly at its thirty-fifth session (A/35/458). At that session, the Assembly adopted resolution 35/157, in which it took note of the progress report of the Secretary-General and requested him to pursue his efforts in that regard and to submit his report to the Assembly at its thirty-sixth session.

8. At the thirty-fifth session of the General Assembly, Israel submitted a draft resolution (A/C.1/35/L.8) by which the Assembly would call upon all States of the Middle East and non-nuclear-weapon States adjacent to the region to convene a conference with a view to negotiating a multilateral treaty establishing a nuclear-weapon-free zone in the Middle East. The proposal was strongly criticized by a number of Arab States, particularly on the ground that it set up an unacceptable precondition to the creation of a nuclear-weapon-free zone. 1/ Israel later withdrew the draft resolution. It then announced that it would support the resolution on a nuclear-weapon-free zone in the Middle East initiated by Egypt, which was similar in content to those adopted by the Assembly in previous years (see para. 3 above). This resolution (Assembly resolution 35/147) was adopted by the Assembly without a vote.

9. Subsequently, in a letter dated 20 April 1981 addressed to the Secretary-General (A/36/220), Egypt noted that it had recently ratified the non-proliferation Treaty and suggested that in the light of that step and to safeguard the momentum generated therefrom, "it may be appropriate to consider undertaking a study to explore the modalities for establishing a nuclear-weapon-free zone in the Middle East, taking into account the characteristics particular to the region".

10. In a letter dated 9 June 1981 addressed to the Secretary-General (A/36/315), Israel reiterated the proposal contained in its earlier draft resolution calling upon all States of the Middle East and non-nuclear-weapon States adjacent to the region to convene at the earliest possible date a conference with a view to negotiating a multilateral treaty establishing a nuclear-weapon-free zone in the Middle East. In addition it formally and urgently requested that all States of the Middle East, and States adjacent to the region indicate in the course of 1981 their consent to the holding of a preparatory conference to discuss

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1/ I.e., that the zone should be created on the basis of "negotiated regional arrangements". See the statement made on 18 November 1980 by the representative of Jordan to the First Committee (A/C.1/35/PV.33).

the modalities of such a conference. Israel also welcomed the suggestion made by Egypt in its letter of 20 April 1981 regarding the preparation of a study on the modalities for establishing a nuclear-weapon-free zone in the Middle East and for its part, proposed "that the study be undertaken by qualified experts from Middle East States, including Israel".

11. On 9 June 1981, following Israel's bombing attack on the Iraqi Nuclear Research Centre at Tuwaitha, the Director-General of the International Atomic Energy Agency (IAEA) made a statement to the Board of Governors of IAEA in which he said, inter alia, that the Agency's safeguards system was a basic element of the non-proliferation Treaty and that from a point of principle one could only conclude that it was the Agency's safeguards régime which had also been attacked. On 12 June 1981, the Board of Governors of IAEA adopted a resolution in which it recommended that the General Conference of IAEA at its forthcoming regular session consider all the implications of the attack, including suspending the exercise by Israel of the privileges and rights of membership, reminded member States of the Agency of General Assembly resolution 33/71 calling for an end to all transfer of fissionable material and nuclear technology to Israel, and recommended that the General Conference should suspend provision of any assistance to Israel under the Agency's technical assistance programme (see S/14532 and Add.1).

12. On 19 June 1981, the Security Council adopted resolution 487 (1981), in which, inter alia, it strongly condemned the military attack by Israel on Iraqi nuclear isntallations, noted that Israel had not adhered to the non-proliferation Treaty, that Iraq had been a party to the Treaty since it came into force in 1970, characterized the attack as a serious threat to the entire IAEA safeguards régime which was the foundation of the non-proliferation Treaty, and called upon Israel urgently to place its nuclear facilities under IAEA safeguards.

13. Member States' concern with Israeli nuclear developments had for some time been reflected in their discussions in the General Assembly of reported nuclear collaboration between Israel and South Africa. At the thirty-fourth session of the General Assembly, Member States from Africa initiated the adoption of resolution 34/76 B of 11 December 1979, in which the Assembly, inter alia, requested the Secretary-General to prepare, with the assistance of appropriate experts, a comprehensive report on South Africa's plan and capability in the nuclear field. The report 2/ was subsequently completed and submitted to the Assembly at its thirty-fifth session. With regard to the question of a possible nuclear collaboration between Israel and South Africa, it was noted in paragraph 37 of the report that, until specific examples of actual nuclear exchanges or transactions could be cited as clear evidence of such co-operation, the whole question remained in a state of uncertainty.

2/ United Nations publication, Sales No. E.81.I.10. The report was previously issued under the symbol A/35/402 and Corr.1.

B. Israel's nuclear activities in the regional context

14. Reference is made in paragraph 2 above to the long-standing tension in the area, which, in the view of experts on Middle East affairs, may play a role in Israeli military thinking, including its nuclear policy. The concern about the situation in the region has directed attention to the military implications of Israel's nuclear policy as well as its past and present nuclear activities. Statements made by high-ranking Israeli officials have also constituted grounds for increasing alarm among the Arab States. 3/

15. Israel has signed and ratified the Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and under Water (1963) 4/ and the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (General Assembly resolution 2222 (XXI)) and has repeatedly stated that it would not be the first to introduce nuclear weapons into the region (see sect. IV below). So far, however, it has not become a party to the Treaty on the Non-Proliferation of Nuclear Weapons, nor has it otherwise placed the larger part of its nuclear facilities under international safeguards. Since Israel is thus under no statutory obligation to supply IAEA with an inventory of all its nuclear facilities and materials, there exists ambiguity about the nature and scope of Israel's nuclear programme. On the other hand, several countries in the region which have nuclear activities, for example, Egypt, Iran, Iraq, the Libyan Arab Jamahiriya and Turkey, are parties to the non-proliferation Treaty and have thus undertaken to submit all their nuclear facilities to the safeguards of IAEA. In addition, Jordan, Lebanon and the Syrian Arab Republic, which have no significant nuclear activities, are also parties. 5/

16. Against this background, reports that have appeared since the 1960s that Israel may be developing a nuclear explosive capability have led to widespread concern. These reports pertain, on the one hand, to the supposed acquisition by Israel of facilities by means of which it would be in a position to produce the necessary weapons material. On the other hand, there have been reports that

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3/ For example, President Katzir's reported statement, quoted in The Guardian on 3 December 1974: "It has always been our intention to develop the nuclear potential. We now have that potential." The newspaper report continues: "The President said that if the need arose, Israel could convert capability into fact 'in a short time - even in a few days'."

4/ United Nations, Treaty Series, vol. 480, No. 6964, p. 43.

5/ A number of other countries in the region which have no significant nuclear activities are not parties to the non-proliferation Treaty. These include Algeria, Bahrain, Oman, Qatar, Saudi Arabia and the United Arab Emirates. Kuwait and Yemen have signed but not ratified the Treaty.

significant quantities of nuclear material have been found to be missing at various sites abroad, and there has been speculation that some of that material might have found its way to Israel (see paras. 44-45 below). Reports of this nature have been published and discussed in various newspapers and periodicals, journals specializing in foreign policy and international relations issues, scientific-technical and specialized military periodicals, and monographs and special studies dealing specifically with the question under discussion. However, the level of reliability of these diverse publications varies considerably.

II. ISRAEL'S NUCLEAR DEVELOPMENT

A. Nuclear weapons and the technical requirements for their manufacture

17. Since this section of the study deals in large part with material which is relevant to an assessment of Israel's capacity to manufacture nuclear weapons, it seems useful to preface it with some explanatory comment on the requirements for the manufacture of such weapons. 6/

18. The main requirements for making a nuclear explosive device are:

(a) The possession of sufficient quantities of nuclear material of weapon-grade quality;

(b) The presence of skilled personnel possessing the information and knowledge necessary to design and fabricate an explosive device;

(c) The availability of the necessary technology and equipment.

19. The energy released by a nuclear weapon is a by-product of the process of change in the nucleus of the atom. In the fission bomb, the process involved is the splitting of uranium or plutonium nuclei into lighter fragments, fission products. 7/

20. Two main types of fissionable nuclear material are used for the fabrication of an explosive device: substantially enriched uranium and plutonium. Uranium is enriched at special plants where various physical and chemical processes are used to increase the uranium-235 content in the natural uranium (uranium-238) from 0.7 to upwards of 90 per cent (though lower grades can be used). Plutonium is the result of a long chain of nuclear transmutations that occur when uranium-238 absorbs neutrons in the course of irradiation in nuclear reactors. For this purpose, it is most efficient to make use of especially "dedicated" production reactors, but it should be mentioned that significant quantities of plutonium (possible of a lower quality) are produced in power reactors. After having been chemically separated from the irradiated nuclear fuel, plutonium may be converted into metallic form, which makes it most suitable for the manufacture of explosive devices.

6/ This section of the study is largely adapted from a report issued by the United Nations in 1968: Effects of the Possible Use of Nuclear Weapons and the Security and Economic Implications for States of the Acquisition and Further Development of These Weapons (United Nations publication, Sales No. E.68.IX.1; reprinted in Basic Problems of Disarmament, United Nations publication, Sales No. 70.I.14). See also the Comprehensive Study on Nuclear Weapons (United Nations publication, Sales No. E.81.I.11). Throughout the study, the terms "nuclear weapon", "nuclear bomb" and "nuclear device" are used interchangeably.

7/ In a more sophisticated thermonuclear or hydrogen bomb, nuclei of heavy hydrogen isotopes - deuterium and tritium - are fused together at the very high temperatures created by the fission process in uranium or plutonium.

21. In order to sustain the chain reaction in a fission explosion, it is necessary to have at least a given minimum amount of fissile material, the so-called critical mass. This mass depends upon the purity and density of the fissile material, its geometrical shape, the possible presence of neutron reflecting materials and other factors. The fissile material has to be brought together very quickly if the weapon is to explode with great force. Conventional explosives are used for this purpose, and the fissile material is thereby brought together, with or without compression, to a size which, for a plutonium bomb, needs to be no larger in volume than a man's fist. At this time the chain reaction is initiated. The 1968 United Nations study on nuclear weapons set 8 kg. of plutonium or 25 kg. of highly enriched uranium-235 as the amount necessary to achieve an explosion with a yield corresponding to 20 kt. of TNT explosive. 8/

22. In the specific case of Israel, the first requirement, that is, the possession of sufficient quantities of nuclear material of weapon-grade quality, is discussed in section B below. As to the second requirement for the manufacture of nuclear weapons, skilled personnel, the current level of openly available information in the areas of physical science and nuclear technology would provide scientists and engineers with the necessary knowledge. All the basic information required for the design and construction of a fission explosive is published in the open technical literature or may be derived therefrom by reasonably competent specialists. A wide international exchange of scientists in such nuclear technology areas as reactor technique, enrichment and reprocessing has created a situation in which personnel with the required qualifications are now available in a number of countries other than the nuclear-weapon States.

23. The need for equipment can be met in some cases through purchases abroad and in others by indigenous manufacture. While international control and safeguards play an important part in preventing the undeclared use of scientific equipment, the possibility cannot be entirely excluded that scientific equipment may be used at times for undeclared aims. The ancillary equipment and facilities required to make fission explosives can vary over a huge range of degrees of accessibility and

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8/ If a fission device is accompanied by the heavy isotopes of hydrogen, the high temperature and pressure triggered by the explosion can cause the fusion of these isotopes into heavier ones, thereby releasing vast amounts of energy. Even though one fusion reaction releases less energy than one fission reaction, the amount of energy released per kilogram of nuclear explosive material can be more than four times as large in a fusion device as in a fission device.

The design of a thermonuclear (fusion) weapon is publicly less well known in all its details. The energy released comes both from the fission "trigger" and the fusion materials. A considerable amount of fission energy may also be added by surrounding the fusion weapon with a shell of uranium-238. The fission reactions give rise to much larger amounts of radioactivity than the fusion reactions. For this reason, thermonuclear weapons are sometimes spoken of as "clean" or "dirty" depending on what fraction of their total energy release derives from fission. Even a "clean" weapon generates some radioactivity, however, both as debris from the fission trigger and tritium and as "induced activity" caused by the massive outflux of neutrons from the explosion.

complexity, depending on the desired explosive characteristics, the degree of concern for the safety of the people involved, the time available to complete the process and a number of other factors. 9/

24. Finally, one has to consider that nuclear-weapon capability also implies the ability to construct nuclear explosive devices that can be delivered to a target as well as the possession of means for such delivery. Furthermore, a State aiming at nuclear-weapon status would need the capacity to produce the number of nuclear weapons that would be meaningful both from a political and a military point of view.

B. Origins and history of Israel's nuclear development

1. Background

25. Israel has been involved since its establishment in nuclear research and development. A Department of Isotope Research was established in the Weizmann Institute in Rehovoth as early as 1949. 10/ This has been reported to include four laboratories dealing with applied nuclear physics, spectroscopy, electronics and nuclear magnetic resonance. 11/

26. Large-scale geological prospecting was initiated in the Negev desert in 1949 to determine the size of phosphate deposits and the uranium concentration in them. 12/ At about the same time, research on the production of heavy water began at the Weizmann Institute, and it was officially stated that Israel had acquired its own heavy-water production capacity on a pilot scale. 13/

27. As early as 1953, a co-operation agreement was concluded between the Israel Atomic Energy Commission and France's Commissariat à l'Energie Atomique, and co-operation under that agreement is said to have begun in the same year. 14/ Information about important aspects of that co-operation has never been made public officially, but it is known that the French Government agreed in 1957 to supply Israel with a nuclear facility (a 25 megawatt thermal research reactor using

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9/ To produce the more advanced types of nuclear explosive devices, in particular hydrogen weapons utilizing the fusion reaction, the requirements are considerably greater than those arising in a programme aiming at the production of relatively unsophisticated nuclear explosive devices.

10/ Statement made by A. Eban on 15 November 1954 in the First Committee of the General Assembly contained in Official Records of the General Assembly, Ninth Session, First Committee, 716th meeting. pp. 335-337.

11/ Tempo, Milan, 15 December 1974.

12/ Eban, loc. cit., and F. Jabber, Israel and Nuclear Weapons (London: Chatto and Windus), p. 23 (referring to Michel Bar-Zohar, Suez-Ultra Secret, Paris: Fayard, 1964).

13/ Eban, loc. cit.

14/ Jerusalem Post, 16 November 1954; and F. Jabber, op. cit., pp. 20-21.

natural uranium and heavy water) at Dioma in the Negev desert. 15/ Later, in 1961, the French President is said to have made it clear to Israeli officials that this assistance was limited to the construction and operation of the reactor. 16/ The Dimona facility has never been subject to international controls or inspection. Visits were paid by American delegations from 1963 to 1969. United States officials were reported in 1969 as describing their visits as inadequate to guarantee that the reactor was used solely for peaceful purposes. There have apparently been no further visits of this kind since 1969. 17/

28. Under the United States Atoms for Peace Programme adopted by the Eisenhower administration, a United States-Israel agreement was signed on 12 July 1955. In accordance with the agreement, the United States provided Israel with a pool-type research reactor (IRR-1) with a capacity of 1 megawatt. 18/

29. This research reactor was set up at Nahal-Soreq. Until 1965, the Nahal-Soreq reactor remained under United States inspection; it was then placed under IAEA safeguards in accordance with the agreement concluded by the United States, Israel and IAEA on 18 June 1965 (IAEA-UNFCIRC/84). On 4 April 1975, the agreement was replaced by a similar agreement which was extended by a Protocol of 7 April 1977 (IAEA-UNFCIRC/249 and Add.1).

30. Initially, natural uranium supplies were reportedly obtained by Israel on the world market from a number of sources, mainly Western and African. 19/ Later, the Israelis are said to have also devised their own method of extracting uranium from the phosphate deposits in the Negev desert. 20/

15/ Goldschmidt, Bertrand, Le Défi Atomique, (Paris: Fayard, 1980), pp. 205-206.

16/ Goldschmidt, op. cit., p. 205. See also C. De Gaulle, Mémoires d'Espoir, (Paris: Plon, 1970). De Gaulle's own reference to these events is as follows: "... I put a stop to irregular dealings which had developed between Tel Aviv and Paris on the military plane ... In particular, French co-operation in the construction of a factory near Beersheba for the transformation of uranium into plutonium - from which, one fine day, atomic bombs might emerge - was brought to an end". (Memoirs of Hope, New York: Simon and Schuster, p. 266.)

17/ "For several years American technical experts have made inspection trips to the Dimona reactor. Each year they have reportedly been somewhat dissatisfied that their inspection was hurried and limited, but they have never reported finding any evidence of weapons-related research there. The 1969 inspection team complained in writing about the limitations on its inspections and reportedly stated that, for this reason, it could not guarantee that there was no weapon-related work at Dimona." (The New York Times, 18 July 1970).

18/ Text of the agreement in United States Treaties and Other International Agreements, vol. 6, part 2, 1955, pp. 2641-2646.

19/ Goldschmidt, op. cit., p. 206.

20/ Ketzinel, Z., "Uranium sources, production and demand in Israel," Proceedings of the Fourth International Conference on the Peaceful Uses of Atomic Energy, Geneva, 6-16 September 1971, vol 8, pp. 113-119; "Better Prospects for Phosphate Production", Nuclear Engineering International, June 1980.

31. By the mid-1960s, Israel's nuclear research programme had extended to all major areas of nuclear science and technology including various aspects of nuclear material production.

2. Nuclear facilities, activities and resources

(a) Nuclear research activities

32. The basic components of Israel's nuclear infrastructure are the Israel Atomic Energy Commission and the National Council for Research and Development, which operate and supervise several nuclear research institutes and centres including the Department of Nuclear Science at the Weizmann Institute at Rehovoth, the Institute of Technology-Technion at Haifa, the Nuclear Research Center at Nahal-Soreq and the Dimona Centre. Additional research activities are said to be conducted by the Ministry of Defence. 21/

33. Extensive scientific contacts exist between Israel's nuclear scientists and those of many other countries. Israel has a considerable number of experts in nuclear physics, nuclear chemistry and other areas related to nuclear energy. Many of them have studied in other countries for long periods of time, and many are experts with high qualifications and long experience of work in the nuclear industry.

(b) Reactors

(i) The Nahal-Soreq reactor - IRR-1

34. The Nahal-Soreq research reactor, IRR-1, is a pool-type light-water reactor, provided by the United States. The reactor, using 90 per cent enriched uranium, went into operation in June 1960 with a 1 megawatt capacity. By 1969, it had its capacity increased to 5 megawatts. 22/

(ii) The Dimona reactor - IRR-2

35. The Dimona reactor, a natural uranium research reactor, heavy-water moderated, had an initial thermal capacity of about 25 megawatts. The reactor, which went into operation in December 1963, was built with the help of French scientists and engineers. To fuel this reactor, an initial supply of 20 to 25 tons of uranium was needed. The annual production of plutonium from a reactor of this size might be 8 to 10 kilograms, which, when reprocessed, is close to what is thought to be required for the production of one plutonium atomic bomb (see paras. 17-24 above and para. 51 below).

21/ Jabber, op. cit., pp. 51-53.

22/ Power and Research Reactors in Member States, September 1969 edition (Vienna: IAEA, 1969).

36. It has recently been claimed that the capacity of the reactor may have been increased to 70 MW. 23/ If this is correct, annual plutonium production could have increased to about 25 kilograms, which would be enough to produce 3 bombs.

(c) Uranium extraction and production

37. In the early 1950s, a research and planning branch of the Israel Defence Ministry is said to have carried out a detailed survey of uranium resources in the Negev desert, and research was undertaken on the processing of low-grade uranium ores such as phosphates, which contain from 0.01 to 0.02 per cent of uranium. 24/ Israel is reported to be devising its own extraction processes which are specially applicable to types of phosphate rocks unsuitable for the usual fertilizer production. 25/ According to the same source, there are three phosphoric acid plants in Israel at present. Two small plants in Haifa will each be producing at full capacity about 15,000 tons of phosphoric acid (P_2O_5) a year and the third, which started operation in 1972, in the southern part of Israel, will make about 160,000 tons P_2O_5 a year. The uranium available from the three plants would be about 100 tons per year. In mid-1975, it was estimated that the phosphate reserves in the Negev contained from 30,000 to 60,000 tons of natural uranium. 26/

(d) Heavy water availability and production

38. As noted in paragraph 26 above, in November 1954, the then Permanent Representative of Israel, Abba Eban, officially stated in the First Committee of the General Assembly that a pilot plant for production of heavy water was already in operation in Israel. 27/ In 1979, the Stockholm International Peace Research Institute (SIPRI) reported that a small-scale facility, whose contractor and first year of operation are not known, existed in Israel, 28/

39. According to an official source, 29/ "the largest proportion of heavy water requirements for a HWR (heavy water reactor) programme is that for the initial

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23/ "The Middle East's Nuclear Race", Foreign Report, The Economist, London, 13 August 1980.

24/ Eban, loc. cit.

25/ Ketzinel, Z., op. cit.

26/ Peleg, A., "Room for Only Two Power Stations on Israel's Coast", Maariv, 2 July 1975.

27/ Eban, op. cit.

28/ SIPRI Yearbook, 1979, pp. 315-316. SIPRI noted that "the facility may have been built in the early 1970s, as national control of heavy water exports got stricter. It is not known whether capacity has been sufficient to keep the Dimona reactor in operation after Norway declined further deliveries of heavy water in 1970".

29/ International Nuclear Fuel Cycle Evaulation, Fuel and Heavy Water Availability, Report of INFCE Working Group 1 (Vienna: IAEA, 1980).

inventory of new reactors. Makeup requirements are very small in comparison." Taking this into account, it may be concluded that loss through leaks and other likely losses could be replaced by purchase of small quantities of heavy water on the world market or by indigenous production.

40. Israel has also received some heavy water from the United States for research purposes and under safeguards. 30/

(e) Uranium enrichment

41. Research is said to be under way in Israel, as in some other countries, on new methods of enriching uranium through the use of laser beams for isotope separation. 31/ Such methods might have considerable economic advantages, including their potential efficiency and the savings of electricity in relation to other uranium enrichment techniques. It appears that this research is still at a laboratory stage. 32/

(f) Plutonium separation

42. It is widely assumed that the scientific nuclear programme of Israel includes some research into plutonium extraction. IAEA and SIPRI have reported that a pilot facility for the reprocessing of spent fuel exists in Israel. 33/ According to SIPRI, the principal equipment for the facility was supplied by a French firm. 34/ There is no official confirmation regarding the capacity of this facility, although there are reports that it is capable of handling up to 3,400 kilogramm of irradiated fuel a year from which it can extract from 4 to 5 kilogramm of plutonium. 35/ It is also possible to separate small quantities of plutonium in radiochemistry laboratories (so-called "hot cells"). Many advanced universities, in fact, possess radiochemistry laboratories where such work may be carried out on a small scale. For purposes of manufacturing nuclear weapons, it is technically desirable to achieve as high a fissile content of the plutonium (i.e. more than 90 per cent of the isotope 239) as possible. 36/

30/ United States Atomic Energy Commission, Annual Report 1966, cited in Jabber, op. cit., p. 23.

31/ Gillette, Robert. "Uranium Enrichment: Rumors of Israeli Progress with Lasers", Science, No. 183, March 1974.

32/ "Nuclear Power Issues and Choices", Report of the Nuclear Energy Policy Study Group, Cambridge, 1977; J. B. Yasinsky, "Nuclear Proliferation", Nuclear Energy Digest, No. 4, 1976 (Westinghouse Journal); see also J. Yager, editor, Non-Proliferation and U.S. Foreign Policy, Brookings Institution, 1980, p. 209.

33/ See International Atomic Energy Agency Bulletin, vol. 19, No. 5, p. 2; and SIPRI Yearbook, 1979, p. 314.

34/ SIPRI Yearbook, 1979, loc. cit.

35/ International Military Review (Moscow), No. 6, 1980, p. 20.

36/ Taylor, Theodore B., "Nuclear Safeguards", Annual Review of Nuclear Science, No. 25, 1975; see also A. De Volpi, Proliferation, Plutonium and Policy, Pergamon Press, 1979.

(g) Commercial programme

43. During President Nixon's administration, in 1974, Israel and the United States entered into discussions concerning U.S. aid in the construction of a 600-megawatt reactor. However, no final agreement was ever reached. Israeli scientists have stated that they are still interested in pursuing the project. 37/ Various proposals have been made since the 1960s for the installation of a large-scale seawater desalination facility to be coupled to a nuclear power reactor. No real forward movement has occurred on such projects.

(h) Availability of uranium

44. Besides the natural uranium which Israel is reported to have openly obtained from Western and African sources (see paras. 13 and 30 above), it may also be possible that South Africa has supplied additional quantities of natural uranium to Israel without any public announcement of such sales. There have further been unsubstantiated reports and allegations that the Dimona reactor has been fuelled with the help of 200 tons of uranium which were sold in 1968 by the Union Minière du Haut Katanga to an Italian firm and shipped from Antwerp to Genoa, but diverted somehow from the latter destination. 38/

45. There have further been reports of possible diversions of highly enriched uranium in the United States. These reports allege that such materials were diverted to Israel. 39/

C. Extent of the application of international safeguards to nuclear facilities and material in Israel

46. The safeguards applied in Israel by IAEA are limited to the research reactor supplied by the United States pursuant to its agreement for co-operation with that country (see para. 29 above) and to the nuclear material associated therewith.

37/ Adar, J., Nuclear Energy in Israel, prepared for Neeman Foundation, Technion, The Israel Institute for Technology; "Israel to Go Nuclear", Nuclear Engineering International, July 1980.

38/ See Leventhal, Paul, "International and National Responses to the Spread of Nuclear Energy and Nuclear Weapons", ECO Journal, 2 May 1977, Salzburg (paper presented to the Salzburg Conference for a Non-Nuclear Future, 29 April-1 May 1977); Davenport, Eddy and Gillman, The Plumbat Affair, Deutsch, London; Jacchia, E., Operation Plumbat, Editions du Seuil, Paris. Israel has denied these reports (Los Angeles Times, 29 April 1979).

39/ Burnham, David: "The Case of the Missing Uranium", The Atlantic, 1243, 4, 1979. U.S. Officials have denied such diversions; see "Washington Star", 23 March 1977. See also sect. V below.

This includes ancillary facilities if they contain nuclear material from the research reactor and some other items supplied by the United States. The safeguards are applied pursuant to a trilateral agreement between the Governments of Israel and the United States and IAEA, initially concluded in 1965 (INFCIRC/84); this expired in 1975 and was replaced by a new agreement concluded that year (INFCIRC/249), which in turn was extended by a protocol of 1977 (INFCIRC/249/Add.1).

47. None of the other nuclear facilities that Israel is reported to possess is covered by international safeguards. Since Israel is not a party to any agreement by which it would undertake to notify IAEA of such further nuclear facilities, there is no official information about the larger part of Israel's present nuclear programme. In this situation it is impossible to ascertain authoritatively to what extent, if any, Israel's unsafeguarded nuclear facilities, including in particular the Dimona reactor and its associated installations, are used for the purpose of producing weapon-grade material.

48. In the opinion of the Group of Experts Israel has not only fallen short of subjecting all its own nuclear facilities to international inspection but has also acted to undermine the credibility of IAEA safeguards elsewhere in the region. The most dramatic Israeli attack on the credibility of IAEA safeguards was the bombing of the Iraqi nuclear facility in June 1981, despite IAEA assurances that it had inspected the Iraqi reactors and had not found evidence of any activity which was not in conformity with the non-proliferation Treaty. As the Director-General of IAEA put it, "from a point of principle, one can only conclude that it is the Agency's safeguards régime which has also been attacked". 40/

49. The Group of Experts considered that Israel had not offered the world community satisfactory assurance about the use it was making of its nuclear capabilities. After the Israeli Air Force's bombing attack on the Baghdad nuclear facility, it is unlikely that the world community will be content to accept unilateral judgement by Israel of the nuclear intentions of States in the Middle East, while exempting itself from offering greater reliability on this point. In the opinion of the Group of Experts, the raid on Iraq's reactor amounted to a unilateral veto on the acquisition of a nuclear capability by a State particularly distrusted by Israel, even though that State had accepted IAEA safeguards.

40/ IAEA press release PR 81/9, 9 June 1981. Further, as noted in paragraph 11 above, the Board of Governors of IAEA subsequently (12 June 1981), by a vote of 29 to 2, with 3 abstentions, adopted a resolution stating, in part, that Israel's military action had shown clear disregard for the Agency's safeguards régime and the non-proliferation Treaty and reaffirming its confidence in the effectiveness of the Agency's safeguards system as a reliable means of verifying peaceful use of a nuclear facility (Security Council document S/14532).

III. ISRAEL'S NUCLEAR-WEAPON POTENTIAL

A. Availability of necessary nuclear explosive materials

50. Calculating on the basis of its original capacity (which may have been increased) the Dimona reactor is capable of producing annually 8 to 10 kilograms of plutonium containing 70 per cent of the fissile isotope 239. In the period from 1963 to the present, around 100 kilograms could thus have been produced (assuming 6 to 8 months of operation a year). In light of the various possibilities of plutonium reprocessing listed in paragraph 42 above, it is physically possible that Israel now processes enough separated plutonium to manufacture 10 to 15 nuclear warheads.

51. In assessing a possible nuclear weapons capacity on the part of Israel, consideration may also have to be given to the allegations that important quantities of highly enriched uranium may be missing from a nuclear installation in the United States and might have been diverted to Israel (see para. 45 above and sect. V). Estimates of the amount of material possibly diverted range as high as 200 lbs, which would be enough for several bombs.

52. Another way for Israel to obtain enriched uranium would be to undertake this process itself, enriching natural uranium obtained from abroad or extracted from the deposits it is reported to possess. This possibility may be more relevant in the future, given the potential feasibility of enrichment processes involving smaller and relatively inexpensive systems. One of the concerns about world-wide proliferation is that the spread of advanced enrichment technology may make bombs easier to manufacture in many places.

53. The centrifuge method and the use of jet nozzles have already been proven in practice elsewhere but there is no indication that Israel is constructing installations of that kind. As indicated in paragraph 41 above, Israeli researchers are reported to have been engaged in work on laser enrichment, but this appears to be in a laboratory stage. Israel's laboratory-scale laser enrichment facilities might be capable of producing small amounts of highly enriched uranium, perhaps 2 to 3 kilograms per year. 41/ Considering the time span of seven years (1974-1980), it is physically possible that Israel may have enriched uranium in the quantity necessary to make one bomb. If this technology is developed further, Israel's nuclear weapons potential would increase more rapidly.

54. As enrichment technology spreads elsewhere abroad, the possibilities of foreign supply of enriched uranium will increase. Concerns over possible Israeli nuclear co-operation with foreign powers have been particularly acute with regard to

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41/ To produce weapons-grade highly enriched uranium containing more than 90 per cent of isotope 235, the amount of separative work needed is approximately 200 separative work units (SWU)/kilogram. Cf. Friedman, Todd, "Israel's Nuclear Option", Bulletin of the Atomic Scientists, September 1974, and "L'Enrichissement Isotopique de l'Uranium", report of the Commissariat à l'Energie Atomique, France, 1980.

South Africa, which has openly stated that it is developing an indigenous "jet nozzle" capability for uranium enrichment.

B. Capability to design and produce nuclear explosive devices

55. There is widespread agreement among technical experts that, given Israel's nuclear activities and level of expertise, it is capable of manufacturing nuclear explosive devices. Some of these experts consider that Israel is capable of assembling a number of nuclear explosive devices within weeks or perhaps even days. 42/

56. There remains the important fact that there has so far been no indication that Israel has ever carried out a nuclear test explosion. Some analysts regard as unwarranted the assumption that such a test detonation would be required for a country like Israel to be sure that it has a workable nuclear weapon. These analysts point out that even the very first type of nuclear weapon to be used in combat, the American uranium bomb dropped on Hiroshima, had not been so tested (the American test-explosion at Alamogordo had involved a plutonium device, similar to the bomb that was dropped on Nagasaki). Moreover, it is the view of these experts that in the 35 years that have since passed, the field of nuclear explosives design has undoubtedly developed ways, including the use of computer simulations, to be assured that a given type of bomb would work without an actual prior test-detonation. 43/ Other experts regard this assumption as unwarranted. 44/

C. Means of delivery

57. Israel possesses various means by which it could deliver nuclear weapons to a target. The distances between Israel and the conceivable targets in the region are all reasonably short, so that modern aircraft and missiles designed to deliver conventional warheads would suffice also to deliver nuclear bombs. Thus, nuclear bombs could be delivered to their targets by such aircraft as the A-4, Phantom, Mirage and Kfir types, which are part of the Israel Air Force.

58. By the late 1960s, Israel had also developed a missile of its own design, the Jericho. This missile has a range of some 450 kilometres and can carry a 5 to 7 kilogram warhead. 45/

42/ See Alexander De Volpi, Proliferation, Plutonium and Policy, Pergamon Press, 1979; J. Yager, Editor, Non-Proliferation and U.S. Foreign Policy, Brookings Institution, 1980.

43/ See F. Jabber, op. cit., pp. 79-80; T. Friedman, op. cit., p. 33.

44/ See Wm. Epstein, "Nuclear Free Zones," Christian Science Monitor, 5 August 1980, p. 22.

45/ SIPRI Yearbook 1973, p. 371.

IV. FACTORS AFFECTING ISRAEL'S NUCLEAR POLICY

A. Israel's nuclear posture

59. A nation's decision to manufacture nuclear weapons depends on its capabilities, incentives and disincentives. This discussion does not imply that a particular development will necessarily occur in the future.

60. Israel, like other States that may possess a nuclear or near-nuclear capability, can exercise one of a number of nuclear policy options. It may eschew nuclear weapons altogether; it may openly cross the nuclear weapons threshold by exploding a nuclear device or by announcing that it possesses nuclear weapons; it may acquire such weapons and deny that it possesses them; or it may acquire a nuclear weapon potential just short of actual possession of nuclear weapons and maintain a posture of ambiguity.

61. A survey of the official and unofficial statements of Israeli policy-makers on Israel's nuclear policy would indicate that Israel's nuclear posture fits either of the last two categories. On 24 December 1965, the Minister for Labour, Mr. Y. Allon, was quoted as saying that "Israel will not be the first to introduce nuclear weapons into the Middle East, but it will not be the second either". 46/ In 1974, President E. Katzir, according to the Washington Post (3 December 1974), stated that Israel "has the potential" to build nuclear weapons and could do so "within a reasonable period of time". On 7 September 1975, the Prime Minister, Mr. Y. Rabin, speaking on the ABC television programme Issues and Answers, said that Israel was "a non-nuclear country" and "it will not be the first to introduce nuclear weapons into the area". On 29 September 1980, Mr. Y. Shamir, Israel's Foreign Minister, stated in the General Assembly that "Israel will not be the first to introduce nuclear weapons into the Arab-Israel dispute" (A/35/PV.15, p. 27). 47/

62. Thus, in its declared policy in the past two decades, Israel has not categorically renounced nuclear weapons. But neither has it chosen to make a demonstration of its nuclear explosive capability, nor has it developed a demonstrable nuclear armament force. Furthermore, at the thirty-fifth session of the General Assembly, Israel for the first time joined the consensus vote on Assembly resolution 35/147, entitled "Establishment of a nuclear-weapon-free zone in the region of the Middle East". In paragraph 2 of that resolution, the Assembly invited Middle East States directly concerned "pending the establishment of such a zone in the Middle East and during the process of its establishment, to declare solemnly that they will refrain, on a reciprocal basis, from producing, acquiring or in any other way possessing nuclear weapons and nuclear explosive devices". 48/

46/ Jewish Observer, 24 December 1965.

47/ It should be noted, however, that in the past Israeli officials have on occasion categorically denied the possession or intention to employ nuclear weapons. Thus, the Prime Minister Mrs. Golda Meier stated in May 1969: "Israel has no nuclear bomb, Israel has no intention of using nuclear bombs." (International Herald Tribune, 10-11 May 1969).

48/ It may be noted that no declarations of this kind have been made as of June 1981.

63. Israel has tended to approach the questions of both the non-proliferation Treaty and a nuclear-weapon-free zone on the basis of prior attainment of peace with the Arab States. In other words, according to this approach, once the region is at peace it can then renounce nuclear weapons, for they would no longer be needed. 49/

B. Disincentives against possession of nuclear weapons

64. Among the considerations that might, in the view of some experts, discourage Israel from possessing nuclear weapons, are the following:

(a) Israel has few, if any plausible military uses for nuclear weapons. Use of nuclear weapons against Arab military or civilian targets would serve no military purpose which could not be served by conventional forces;

(b) Israel has a great deal to lose if it moves beyond its present stance of nuclear ambiguity into a declared or manifest nuclear weapon force status. It might alienate crucial outside support in terms of arms supply, moral and diplomatic support, and economic aid;

(c) Israel could start a nuclear arms race in the region and would expose itself to diplomatic, economic, and possibly military retaliation by Arab and, conceivably, other States.

C. Incentives to possession of nuclear weapons

65. Among the factors that might, in the view of some experts, encourage Israel to possess nuclear weapons are the following:

(a) Israel may see the possession of nuclear weapons as the ultimate deterrent to a conventional military attack that could threaten to destroy it as a State or as a presumed defence against the possibility of future Arab military superiority in conventional terms;

(b) Israel may feel it cannot indefinitely take for granted adequate external supplies of conventional weapons and that it may need to have its own weapon of last resort;

(c) It may regard the possession of nuclear weapons as the only adequate guarantee of its security in the face of a perceived possibility that one or more of its hostile neighbours may acquire nuclear weapons;

49/ As Prime Minister Begin is reported to have said in June 1981, Israel would be prepared even to sign the non-proliferation Treaty once the Arab countries made peace (International Herald Tribune, 9 June 1981).

(d) It is also argued by some that Israel is pursuing an aggressive policy (with regard to its Arab neighbours) and that its land policy, in the occupied territories, including the policy of establishing Jewish settlements, is one of "creeping annexation". The acquisition of a significant level of nuclear armament may be regarded as a necessary part of the attitude of territorial expansion;

(e) It may regard the possession of nuclear weapons as a means of military and political pressure on its regional neighbours.

D. Incentives for a posture of ambiguity

66. Among the factors which might encourage Israel to maintain a posture of ambiguity are the following:

(a) It may see the "bargaining chip" of a nuclear weapons capability which has not yet been exploited as a means of inducing greater economic or conventional military assistance from its supporters abroad;

(b) It might regard the decision to cross the nuclear weapons threshold as irreversible, while to stand back from the acquisition of nuclear weapons allows it to keep all its options open.

67. Israel has not announced a nuclear weapon programme, nor is there advocacy of the desirability of nuclear weapons by the Government. Neither is there evidence of the existence of a deployed Israeli nuclear force. However, Israel has, through its nuclear activities, through its ambiguous nuclear policy statements, through its refusal either to deny or to confirm reports about its nuclear activities, and through its refusal to adhere to the non-proliferation Treaty or otherwise accept safeguards on all its nuclear activities, conveyed the strong impression that it possesses a nuclear-weapon potential. This may well be regarded by Israel as a deterrence posture.

68. Finally, Israel's posture of ambiguity has apparently created enough uncertainty to pursuade the General Assembly of the need for the present study.

V. INTERNATIONAL REPORTS CONCERNING ISRAELI NUCLEAR ARMAMENT

69. Over the last ten or fifteen years many accounts have appeared in the press, in other information media, in academic journals and in books, to the effect that Israel has already acquired nuclear weapons. As early as 17 July 1970, the New York Times published an article referring to United States national intelligence assessments and stating that it was assumed by the United States Government that Israel "either possessed an atomic bomb or has component parts available for quick assembly". A number of such reports, sometimes quoting from documents allegedly originating with the United States Central Intelligence Agency,

have since appeared at intervals, particularly in American media. 50/ Reports to the same effect have also been published in other countries, e.g., Der Spiegel (Federal Republic of Germany), 5 May 1968; New Times (Moscow), No. 39, September 1977; and Foreign Report (London), 13 August 1980.

70. While such reports cannot be ignored, it is difficult to make an over-all assessment of their credibility. A number of experts therefore regard them as inconclusive.

VI. CONCLUSIONS

71. In carrying out its mandate to study the question of Israeli nuclear armament, the Group of Experts has sought to make its evaluation as factual and concise as possible on the basis of available information. However, because of gaps in the availability of reliable information, some of the specific assessments may be subject to an element of uncertainty.

72. Ever since its establishment, Israel has been actively engaged in various aspects of nuclear research. It has reportedly developed its own sources of uranium and has acquired expertise of various processes that make up the nuclear fuel cycle. Especially in the decades of the 1950s and 1960s, Israel has maintained close co-operation in the nuclear field with several countries which have helped it in acquiring its nuclear expertise and which have supplied nuclear equipment, materials and technology.

73. All the known nuclear facilities in the territories of the Middle East States are subject to international safeguards. The exceptions are a small research reactor in Egypt and the Israeli research reactor at Dimona and its related facilities. 51/

74. Israel's authorities have not supplied information on the major part of its nuclear programme and activities; in particular critical details about Israel's unsafeguarded Dimona nuclear centre are kept secret. This makes it difficult to make an accurate assessment of the nature of Israel's actual nuclear development and capability.

75. On the basis of what is known about the facilities at Dimona, (the existence of a natural uranium research reactor, with a capacity of about 25 MW (th)

50/ On 26 January 1978 the United States Central Intelligence Agency released a memorandum dated 4 September 1974 entitled "Prospects for Further Proliferation of Nuclear Weapons" in which it stated: "We believe that Israel already has produced nuclear weapons" (New York Times, 28 January 1978). Most recently, a former senior CIA official repeated in an ABC television programme of 27 April 1981 that he and his colleagues believed in 1968 that the "likely case" was that the Israelis were fabricating nuclear weapons. See also Time, 12 April 1976, and The Washington Post, 15 March 1976, p. A2.

51/ It was announced on 30 June 1981 (IAEAPR/81/15) that negotiations between Egypt and IAEA on a safeguards agreement covering the Egyptian reactor had been successfully completed.

pilot reprocessing facility, hot laboratories), the physical possibility exists that Israel may already have enough weapons-grade materials for making several bombs comparable to the bomb dropped on Nagasaki.

76. Israel is reported to be engaged in uranium-enrichment research, specifically on laser isotope separation techniques.

77. Delivery systems would not constitute a major problem, given the short distances between Israel and the conceivable targets in the region. Its existing aircraft and missiles could deliver nuclear warheads.

78. Thus, there is no doubt that Israel has the technical capability to manufacture nuclear weapons and possesses the means of delivery of such weapons to targets in the area. To recapitulate: Israel has an unsafeguarded reactor capable of producing considerable amounts of plutonium and has some means of separating plutonium from irradiated uranium fuel. It has the technological skills and expertise as well as the technical infrastructure required to manufacture nuclear weapons. Since the greater part of Israel's nuclear programme is not under safeguards, and since few technical details about that programme have been made publicly available, it is difficult to assess the full extent of Israel's actual nuclear activity. However, since 1964, when Dimona went into operation, Israel could have produced sufficient weapons-grade plutonium for a significant number of explosive devices.

79. Israel's official statements on its plans and intentions with regard to the possession of nuclear weapons have often been equivocal and have provided little definitive information. It has repeatedly utilized the formula that "Israel will not be the first to introduce nuclear weapons into the Middle East". At the same time, however, Israel has refused to sign and ratify the Treaty on the Non-Proliferation of Nuclear Weapons or otherwise to place all of its nuclear facilities under international safeguards. Israel has not only failed to submit all its own nuclear facilities to international inspection, but has also appeared to undermine the credibility of IAEA safeguards in the region, in particular by the bombing of an Iraqi nuclear reactor, which was under IAEA safeguards.

80. Meanwhile, there have been official and unofficial statements and reports in a number of countries that Israel has already crossed the nuclear-weapon threshold. Discussion of these issues must take account of the political, military and geographic circumstances of the region. Whereas Israel could be moved by a number of cogent arguments to refrain from the acquisition of nuclear weapons, various considerations may be thought to prompt it to acquire nuclear weapons. In fact, Israel appears to have a posture of deliberate ambiguity on this subject, which has contributed considerably to the alarm in the region and to the concern of the world community.

81. The Group of Experts believes that this deliberate ambiguity is or may be a factor contributing to instability in the region and could be an obstacle to the creation of the confidence necessary to achieve a political settlement there.

82. On the basis of the available authoritative information, the Group of Experts is unable to conclude definitively whether or not Israel is at present in the possession of nuclear weapons. There are, however, significant indications that Israel reached the threshold of becoming a nuclear-weapon State at least a decade ago. Taking into account its nuclear facilities, the availability of nuclear material required for their operation, the existence of scientific and technical knowledge and the presence of an adequate number of trained and experienced staff, the Group of Experts wishes to emphasize that they do not doubt that Israel, if it has not already crossed that threshold, has the capability to manufacture nuclear weapons within a very short time.

83. The Group of Experts considers that the possession of nuclear weapons by Israel would be a seriously destabilizing factor in the already tense situation prevailing in the Middle East, in addition to being a serious danger to the cause of non-proliferation in general. However, they wish to add the final observation that, it would, in their view, contribute to avoiding the danger of a nuclear arms race in the region of the Middle East if Israel should renounce, without delay, the possession of or any intention to possess nuclear weapons, submitting all its nuclear activities to international safeguards, through adherence to a nuclear-weapon-free zone in accordance with paragraphs 60 to 63 of the Final Document of the first special session of the General Assembly devoted to disarmament (resolution S-10/2) and with Assembly resolution 35/147, 52/ through accession to the Treaty on the Non-Proliferation of Nuclear Weapons, or by unilaterally accepting such safeguards.

52/ In this connexion, the Group of Experts has noted with interest the suggestion made by Egypt in its letter of 20 April 1981 addressed to the Secretary-General (A/36/220). See para. 9 above.