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The Advanced Weapons Programs of the UAR and Israel

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The Central Intelligence Agency and the intelligence organizations of the Departments of State, Defense, the Army, the Navy, the Air Force, AEC, and NSA.

Concurring:

Director of Intelligence and Research, Department of State
Director, Defense Intelligence Agency
Assistant Chief of Staff for Intelligence, Department of the Army
Assistant Chief of Naval Operations (Intelligence), Department of the Navy
Assistant Chief of Staff, Intelligence, USAF
Director for Intelligence, Joint Staff
The Atomic Energy Commission Representative to the USIB
Director of the National Security Agency

Abstaining:

The Assistant Director, Federal Bureau of Investigation, the subject being outside of his jurisdiction.

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THE ADVANCED WEAPONS PROGRAMS OF THE UAR AND ISRAEL

THE PROBLEM

To estimate likely developments in the advanced weapons programs of the UAR and Israel over the next several years, and the probable consequences of such programs.

CONCLUSIONS

A. We have no positive evidence that the Israeli nuclear program is aimed at achieving a nuclear weapons capability. However, the size of the program, what we know of its nature, and the amount of uranium concentrate acquired all suggest that Israel intends at least to put itself in a position to be able to produce a limited number of weapons relatively quickly after a decision to do so. Indeed, we believe the Israelis, unless deterred by outside pressure, will attempt to produce a weapon sometime in the next several years. We believe that in the most favorable circumstances Israel could detonate a domestically developed nuclear device by late 1965, but a more likely date would be sometime in 1966. Developing the device into a weapon which could be delivered by aircraft would require a year or two more (1967–1968), though this period could be virtually eliminated if Israel obtained from another country detailed and tested weapons designs. (*Paras. 3–10*)

B. We believe that Israel is undertaking the development of a 250–300 nautical mile (n.m.) surface-to-surface missile (SSM) system. A wholly independent Israeli effort to develop and produce such a missile with a payload of 2,000 to 3,000 pounds would probably require three to four years and great expense. However, there is evidence that Israel expects to rely on France for substantial assistance. If Israel acquires full access to French technology, components and test facilities, it probably could

produce a limited number of missiles with a range of about 250 n.m., a payload of some 4,000 pounds, and an elementary guidance system in about two years (1965). By 1968–1969 it probably could produce a few compatible nuclear warheads. (*Paras. 11–15*)

C. The United Arab Republic (UAR), alone or in combination with other Arab States, does not have the capability of producing a nuclear weapon in the foreseeable future. The UAR is attempting to develop a SSM with a range of about 200 n.m. Despite the many difficult problems the UAR faces in its missile program, it may be able to deploy a small number of these weapons by mid-1964, assuming continued help by the West German technicians and a continuing supply of foreign components. We estimate the payload of this missile at only about 500 pounds and its CEP as large. The military value of such a weapon would be small. However, the UAR has a missile program going and has gained experience in the production of missiles. With access to outside help and components, it probably could in a few years produce a more effective weapon. (*Paras. 18–24*)

D. Despite continuing accusations by both the UAR and Israel that the other is developing chemical, biological, and radiological weapons of mass destruction, we have no evidence to confirm these charges. Both countries could, however, produce small quantities of chemical or biological warfare devices designed for clandestine use. Neither country can produce radiological warfare weapons. (*Paras. 16–17, 25*)

E. The purely military significance of any missile system either Israel or the UAR could produce is likely to be modest for some time to come, although if Israel develops a nuclear bomb its military capability will be greatly increased. The political and psychological impact of the advanced weapons programs is more important than the purely military effect and is already being felt. If Nasser could not devise a counter to an Israeli nuclear threat on his own, he probably would turn to the USSR to try to ensure his protection, and the Arabs would blame the West, including the US, for the increased Israeli threat. Israel, likewise, would become increasingly activist in its dealings with the Arabs. The factors which have inhibited a new outbreak of Arab-Israeli

hostilities in recent years still apply. Nevertheless, as the advanced weapons programs progress, tensions will probably rise on both sides. In an atmosphere of this kind, there would always be the possibility that one or the other side would initiate hostile action to safeguard its ultimate security. (*Paras. 26–33*)

DISCUSSION

I. INTRODUCTION

1. The Arabs and Israelis have remained bitterly antagonistic since the establishment of Israel 15 years ago. While all the Arab States are hostile in some degree to Israel, the most important confrontation is that between Israel and the United Arab Republic (Egypt). They have engaged in an arms race since 1955. While scornful of past Arab military performances, the Israelis fear that some day the Arabs, under UAR leadership, will be able to use effectively the formidable weapons they have acquired, principally from the USSR. These fears have almost certainly grown as a result of the recent coups in Iraq and Syria and the subsequent progress toward Arab unity. The Arabs, in turn, are conscious of their military inferiority as proved by their defeats of 1948–1949 and in the Sinai campaign of 1956.

2. The arms race has broadened with attempts by Israel and the UAR to acquire advanced weapons. (No other Arab State has a program to develop advanced weapons.) The UAR is engaged in an attempt to develop surface-to-surface missiles (SSMs) which it hopes will increase its ability—already considerable in view of its jet bomber force—to strike at targets inside Israel. There is also evidence that Israel is attempting to develop SSMs. The most important step which Israel might take, however, is the development of a nuclear capability. Possession of even a few nuclear weapons would vastly increase Israel's present military advantage. Both Israel and the UAR have charged the other with developing biological, chemical, and radiological weapons.

II. THE ISRAELI PROGRAM

3. *Nuclear.* Our evidence on the Israeli nuclear program is limited and there are many aspects on which we cannot speak with confidence. Aside from the small (1–5 megawatt) research reactor at Nahal Soreq, which has no potential for production of weapon grade fissionable materials, the only known reactor is that under construction at Dimona. Here the Israelis are building—with the assistance of the French—a 24–26 megawatt reactor, moderated and cooled by heavy

water and fueled with natural uranium; it is a modification of the French EL-3 design. The Dimona site includes laboratories for handling radioactive and nonradioactive materials, a uranium-metal pilot plant, and associated facilities for workshops, health and safety, and administrative needs. These facilities are either completed or are expected to be completed by the time the reactor is in operation.

5. The Dimona reactor is now expected to go into operation by late 1964, but if the Israelis can obtain the remaining needed equipment and materials promptly, the reactor might go into operation by mid-1964. If the Israelis operated the reactor at its maximum capacity for the production of weapon grade plutonium, they could produce enough plutonium for one or two weapons a year, with enough plutonium for a first device becoming available about one year after the reactor goes into operation.

6. In order to produce weapon grade plutonium, Israel must have uranium, fuel elements, and adequate plutonium separation facilities. The Israelis already have, from domestic production and from small amounts bought from Argentina without safeguards as to use, sufficient uranium concentrate to provide uranium metal for four or five loadings of the reactor. This amount would be enough to operate the reactor for research purposes for about eight to 10 years, or it would permit the operation for production of weapon grade plutonium for two or three years. South Africa has recently contracted to supply uranium concentrate with safeguards. We have also had conflicting reports regarding French agreement to supply fuel for the Dimona reactor. The Israelis have said that they have facilities for producing small quantities of uranium metal from concentrate at Dimona and will fabricate the fuel elements for the Dimona reactor at the site. We have no evidence to confirm the existence of plutonium separation facilities. However, the plant in Dimona is large enough to include them and Israeli industry probably is capable of constructing them.

7. Aside from the production of weapon grade plutonium, there would be many technical problems to resolve before Israel could produce a nuclear device, let alone a weapon. However, Israel has a significant number of scientists with competence in the relevant fields and may benefit through collaboration with the French.

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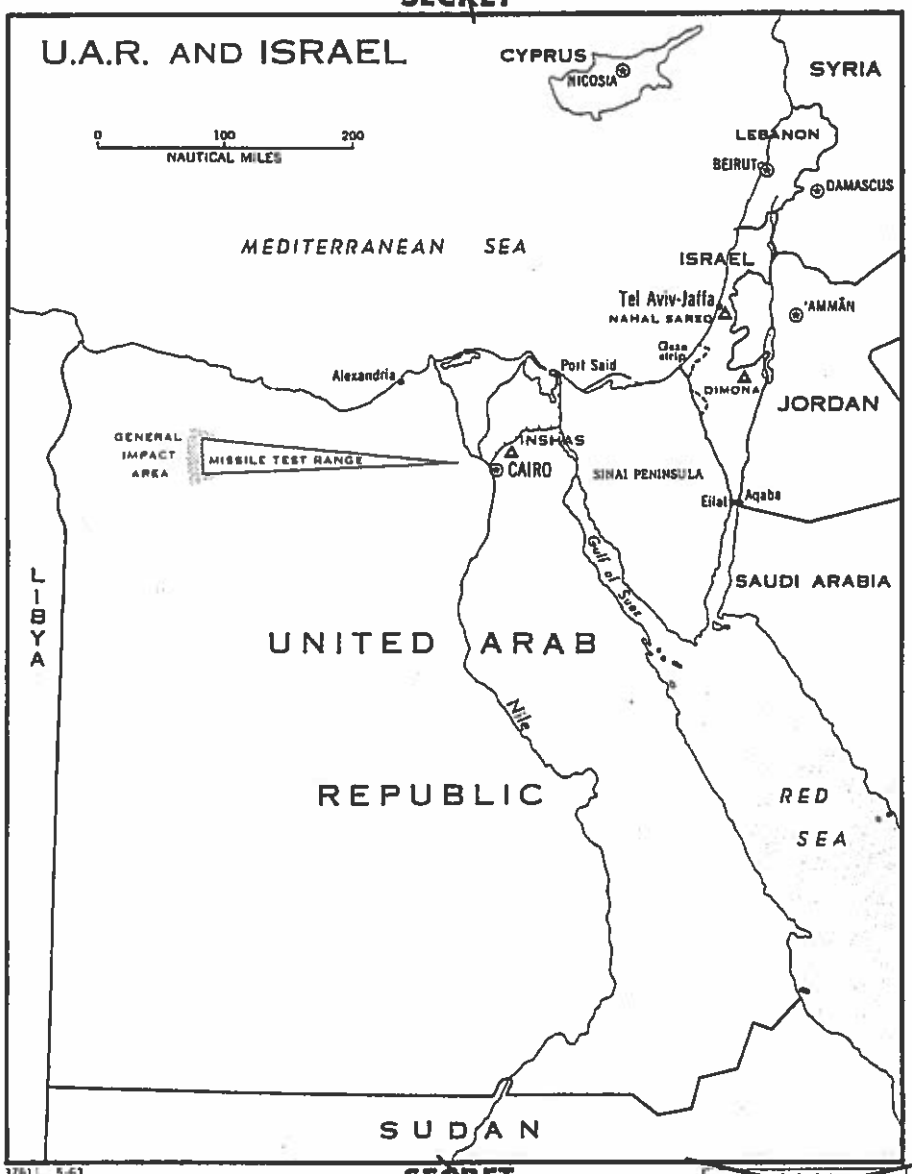

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The development of a weapon, in the absence of proven designs, would require testing. Nuclear testing could be carried out in Israel, in the open or underground, but such testing would raise serious problems. An above ground test in the relatively small area of Israel would present the danger of fall-out both to Israel and its neighbors; underground testing, aside from the inherent problems of a suitable location and terrain, would provide more limited test data.

8.

If Israel were to conduct the test of a device on its own territory, it might not do so until it had accumulated enough fissionable material for more than one device, so as not to be left without any after the test. The slow rate of plutonium production of the Dimona reactor would, in these circumstances, delay testing.

9. All things considered, we believe that in the most favorable circumstances the Israelis could detonate a domestically developed nuclear device by late 1965, but a more likely date would be sometime in 1966. Developing a weapon which could be delivered by aircraft would require a year or two more (i.e., until 1967–1968). This latter period could be virtually eliminated if Israel obtained from another country detailed and tested weapons designs.

10. We have no positive evidence that the Israel nuclear energy program is aimed at achieving a nuclear weapons capability.

The size of the program, what we know of its nature, and the amount of uranium concentrate already acquired all suggest, however, that Israel at least intends to put itself in a position to be able to produce weapons relatively quickly after a decision to do so. Indeed, we believe the Israelis will attempt to produce a weapon sometime in the next several years.

11. *Missiles.* We believe that Israel decided by late 1962 to undertake the development of a SSM system.

12. Israel has already acquired some experience in the missile field as a result of its efforts to develop sounding rockets.[1] Following at least one unsuccessful attempt, the Israelis successfully launched the Shavit, a two-stage sounding rocket, in July 1961. We believe the rocket had a solid propellant, weighed approximately 900 pounds, and reached an altitude of about 50 n.m. where metallic sodium was exploded to form a cloud. Although there have been frequent reports that additional firings in the Shavit program would occur, none has been confirmed. The Israelis have also acquired valuable information on the theoretical aspects of missile technology from research done by Israel under contracts with the US Department of Defense. An Israeli official stated in 1961 that a tactical missile with a range of 30 n.m. had been developed, but we have no information on the production or development of such a weapon. Despite its research to date and the high level of scientific and technical skills available, any wholly independent Israeli effort to develop and produce a 250–300 n.m.SSM with a payload of 2,000 to 3,000 pounds would probably require three to four years (1966–1967) and great expense.

13. In order to obtain a 250–300 n.m. missile as soon as possible, we believe that Israel has decided to rely on considerable foreign assistance, and our limited evidence indicates that Israel is relying on France for such assistance. We do not know the extent of French support, nor do we know the scope or degree of success of the Israeli program for hiring foreign missile experts. Israel would have extreme difficulty in establishing a 250–300 mile test range in its limited territory and so might be forced to test at shorter ranges, and probably would look to France to provide a missile testing range.

14. The French program for SSMs is in a relatively early stage and is designed to produce a medium-range (1,500 n.m.) missile which could carry a nuclear warhead. The solid propellant second stage of this missile has been flight tested. Adapted to a surface-to-surface role, this second stage could deliver a 1,000 pound payload about 120 n.m. We believe that the (liquid fueled) first stage will be flight tested by the end of this year. We further believe that the characteristics of the first stage are such that if adapted to a surface-to-surface role, it could carry a payload of some 4,000 pounds to a range of 250 n.m.

15. If Israel acquires full access to French technology, components and test facilities, we believe it could produce a limited number of missiles with a range of about 250 miles, a payload of some 4,000

[1] Israel has made no effort to develop surface-to-air missiles (SAMs), but is relying on acquisition of US Hawk missiles for air defense.

pounds, with an elementary guidance system in about two years (1965). Any limitation on the availability of French resources would proportionately lengthen the time required for the Israeli capability. By 1968–1969 they probably could develop a few compatible nuclear warheads.

16. *Biological, Chemical, and Radiological Warfare.* Israel is extremely competent in the microbiological and biological sciences, and has sufficient personnel and facilities to develop a modest biological warfare program. However, there is no evidence of an Israeli research and development program for offensive biological warfare (BW) weapons. Israel also has impressive research capabilities in the field of chemical warfare (CW). Research has been done on chemical agent aerosol dissemination, the synthesis and reaction mechanisms of toxic organophosphorus compounds and other poisons. Future efforts probably will include the synthesis of psychogenic agents that have a CW potential. Israeli defensive CW research apparently emphasizes the development of CW agent detectors and antidotes. However, Israel is neither producing nor stockpiling CW defensive equipment, nor are toxic CW agents produced or stockpiled. Israel has no known BW or CW field testing facilities and the Israeli military apparently are skeptical of the efficacy of using CW weapons. However, Israel could produce small BW or CW devices designed for clandestine use in the event of war, and may do so.

17. Israel does not have the reactor capacity to produce more than small amounts of radioactive isotopes, and we have detected no significant shipments of such material to Israel. These factors, combined with the difficult technical problems involved in the development of suitable radiological warfare weapons and the uncertainty of their potential, make it unlikely that Israel will even attempt to develop such weapons.

III. THE UAR PROGRAM

18. *Nuclear.* The UAR nuclear energy program is confined to basic research and the production and use of small quantities of radioactive isotopes; it is limited by the severe shortage of personnel, materials and capital. Under a 1956 agreement with the Soviet Union, the UAR obtained a two megawatt research reactor, which is located at the Atomic Energy Establishment at Inshas. It has virtually no capability of producing fissionable material.

19. Exploration for uranium, originally done with Soviet help, is now being carried out with Yugoslav assistance. Very small quantities of uranium have been produced by limited exploitation of black sand deposits in the Nile Delta. There are no known significant uranium deposits in the UAR or other Arab countries. There is no uranium plant in the UAR and none is envisaged at present. Negotiations for the construction of a heavy water plant with a capacity of about 20 tons an-

nually have been going on for several years with a West German firm, but it is not known if the plant will be built. UAR officials approached both West Germany and the US in 1961 for assistance in developing a nuclear power program, and West German scientists conducted feasibility studies at that time. Under present plans, invitations to bid for the construction of a nuclear power reactor with a design capacity of 100–250 megawatts are to be issued about May 1963. Such a nuclear power reactor would take at least four years to construct.

20. Even after the completion of such a power reactor, diversion of the reactor to the production of plutonium for a nuclear weapons program would require adequate fuel supplies without safeguards as to use and the construction of chemical separation facilities. In addition, the UAR would have great difficulty in designing even a crude device. In view of these limitations, as well as Egypt's generally limited scientific and technical resources, it is clear that the UAR will not have the capability of developing a nuclear weapon in the foreseeable future. The addition of Syria and Iraq to the UAR would not increase the UAR's capability to any significant extent.

21. *Missiles.* The UAR has shown an intense interest in acquiring guided missiles in recent years and has approached most of the missile-producing nations of the world at one time or another. The Egyptian approach has included outright purchase, licensed manufacture in Egypt, and the recruitment of Western European technicians. For example, the UAR has purchased sounding rockets from the US, has acquired short-range tactical naval missiles, air-to-air missiles, and SAMs from the USSR, and has acquired the services of 10–15 West German scientists and engineers to develop SSMs capable of reaching Israel.[2]

22. During the July 1962 celebrations of the tenth anniversary of the Egyptian revolution, the UAR fired four liquid fueled single-stage rockets and paraded 20 more of two sizes through the streets of Cairo. These were sounding rockets, developed in Egypt since early 1960 by West German scientists utilizing material and components procured in Europe. Static testing started early in 1961, and during 1961 there were apparently several unsuccessful as well as a few partially successful firings. The UAR apparently is attempting to convert the larger sounding rocket—the Conqueror—into a SSM. The versions in the parade differ slightly from those fired and appear to represent the initial conversion efforts. As a SSM, the Conqueror probably could deliver a 500 pound payload a distance of about 200 n.m. We believe that this missile will have an unsophisticated guidance system and that its CEP will be large. We have no information that a military version of this rocket has been flight tested.

[2] The balance of the German scientists and technicians in the UAR are engaged in the production of jet engines and aircraft or in nonmilitary projects.

23. The UAR faces many difficult problems in its missile program. Work on the guidance system and the ground-support equipment apparently is still in an early stage. The UAR has a test range in northern Egypt but we believe that it is not instrumented; the Egyptians are currently attempting to purchase instrumentation in the US. The missile effort is totally dependent on outside assistance, and withdrawal of the West Germans or inability to secure materials and components abroad would make it impossible to carry out the program in the foreseeable future. Even under present conditions the reluctance of many of the best qualified European firms to supply components probably makes quality control difficult. Despite these obstacles, the UAR may be able to deploy a small number of the military version of these weapons by mid-1964, assuming continued help by the West Germans and a continuing supply of foreign components and parts. However, with its relatively small payload and large CEP, its military value would be small. Nevertheless, the UAR has a missile program going and if it were to have access to outside help and components, it could probably produce in a few years a more effective weapon.

24. The smaller rocket, the Victor, is a facsimile of the French sounding rocket Veronique. Both were designed by the same German scientist. As a surface-to-surface rocket, the Victor would have a range of about 250 n.m.; however, its small payload—about 130 pounds—and the lack of a guidance system would make it virtually useless as a weapons system.

25. *Biological, Chemical, and Radiological Warfare.* The chemical industry of the UAR is small and while it is being expanded with foreign—including Soviet—help, scientific and industrial resources are severely limited. The UAR has a military CW establishment and may have produced such items as napalm and flamethrower fuels. Further, the UAR may have some World War II toxic munitions left behind on the evacuation of the British bases. While the UAR also makes certain industrial toxics, such as phosgene and hydrogen cyanide, we do not believe that the UAR is now capable of significant research and development of more sophisticated CW agents. We have no evidence that the UAR is trying to produce CW weapons. Similarly, the UAR's ability to produce significant quantities of BW agents is extremely limited, and we have no evidence of any program to do so. In neither the case of CWs, or of BW do we know of any program or facilities for conducting tests of military applications. It is possible, of course, that in either field, the UAR could produce small quantities of CW or BW agents which might be used for clandestine operations. The UAR has no capability of producing radiological warfare agents and we know of no attempt to procure isotopes in the quantities which would be needed for this purpose.

IV. IMPLICATION OF ADVANCED WEAPONS PROGRAMS

26. *Military.* The armed forces of the Arab States have long been inferior in quality to those of Israel, though superior in total numbers and equipment.[3] Even when one or both sides come into possession of a SSM system its purely military significance is likely to be modest for some time. The UAR's missiles will be of little military value without nuclear warheads, and we see no prospect of the UAR's producing such warheads in the foreseeable future. If Israel develops a nuclear bomb deliverable by aircraft its military capability will be greatly increased. Possession of missiles with nuclear warheads would further increase Israel's military superiority, but the Israelis probably will not be able to achieve this for several years. During the next several years, both sides are likely to see any advanced weapons primarily as deterrents against aggression.

27. *Economic.* Our information regarding the economic costs of these weapons programs is scanty. [redacted] We are unable to provide even a rough estimate of the cost of Israel's missile program, but we believe the cost will be substantial. While the Israeli Government is no doubt loath to see such resources diverted from economic development, the burden appears to be within Israeli capacity.

28. The total costs of the UAR's missile program probably have been modest thus far, but a large part has been payable in foreign exchange. Since the UAR's supplies of foreign exchange are relatively small, the drain of the missile program, together with the costs of the much more expensive jet aircraft program, constitutes a significant burden on the UAR.

29. *Psychological and Political.* Although the UAR's missile program does not appear to have great military significance it has had a considerable psychological effect on the Israelis, who are acutely conscious of the compactness of the target which Israel provides to a potential enemy. Moreover, the Israelis see these missiles as weapons against which they have been unable to provide a defense. While the Israelis almost certainly do not fully believe the claims they have made regarding the progress of the UAR missile program and the threat of chemical, biological and radiological warheads, the steps they have taken to frighten the German technicians out of Egypt, the vigor of Israeli propaganda,

[3] See NIE 30-63, "The Arab-Israeli Problem," dated 23 January 1963, for details of Arab and Israeli military capabilities.

and the apparent launching of a high priority missile program are evidence of a real fear of future developments.

30. We believe the motivation of the Israelis for acquiring nuclear weapons to be primarily defensive. Ever conscious of the great numerical superiority of their Arab enemies and of the frequently reiterated Arab threat to drive them out of the Near East, the Israelis would regard possession of nuclear weapons as a powerful deterrent to any Arab aggression. Possession of nuclear weapons would, however, encourage them to be bolder in the use of their conventional resources—both diplomatic and military—in their confrontation with the Arabs. The Israelis might also see the possession of nuclear weapons as confronting the Arabs with such overwhelming force that the latter would give up hope of imposing their will on Israel.

31. In seeking to develop SSMs, Nasser has been in part motivated by a desire to acquire prestige for himself and the UAR. He views such weapons as supporting the UAR's claim to a place of leadership among the Arabs and among the nonaligned countries generally. It is possible that Nasser and the UAR's military leaders are not conscious of the military limitations of their missiles. However, they may be aware of such limitations but see the missiles as the best they can do at present and as a first step toward the development of more effective missiles.

32. The factors which have inhibited a new outbreak of Arab-Israeli hostilities in recent years still apply. Nevertheless, as the advanced weapons programs progress, tensions will probably rise on both sides. If either country came to feel itself in imminent danger, it might go to extreme lengths to maintain its security. If Nasser could not devise a counter to an Israeli nuclear threat on his own, he probably would turn to the USSR to try to ensure his protection. While the Soviet Union might increase its military aid to the UAR, including such advanced weapons as SSMs capable of reaching Israel, we do not believe the USSR would provide nuclear weapons. Israel, likewise, would grow more edgy, becoming increasingly activist in its dealing with the Arabs. In an atmosphere of this kind, there would always be the possibility that one or the other side would initiate hostile action to safeguard its ultimate security, e.g., a pre-emptive UAR air strike against Dimona.

33. Acquisition of nuclear weapons by Israel would add greatly to Arab hostility toward the West. The US as well as France would receive much of the blame in the eyes of the Arabs. Moreover, failure of the US to force Israel to give up its nuclear weapons would be regarded as a result of deliberate US policy, and there would be a growing tendency for the confrontation in the Middle East to take the form of the Bloc and the Arabs against Israel and the West.

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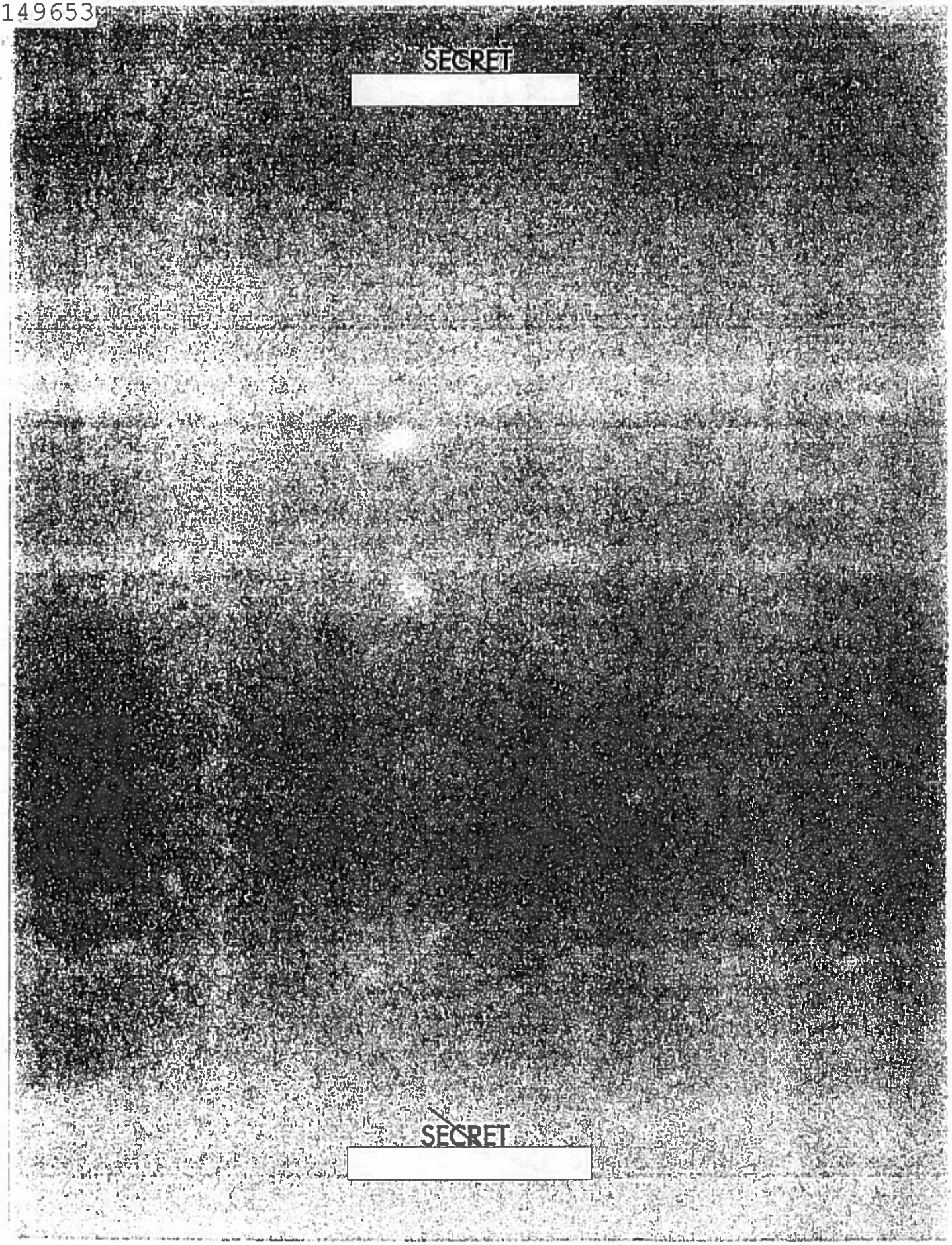

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