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J.I.C./1103/61

COPY NO. 25

SIR HUGH STEPHENSON
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A.C.A.S.(I)
SIR DICK WHITE
DIRECTOR GENERAL, SECURITY SERVICE
DIRECTOR, J.I.B.
MAJOR GENERAL C.R. PRICE, C.R.O.
MR. C. Y. CARSTAIRS, COLONIAL OFFICE
MR. C. LOEHNIS

Copies to:- Mr. B. T. Price, Ministry of Defence
Mr. A. Potts, Joint Intelligence Bureau
Mr. P. J. Kelly, Joint Intelligence Bureau
Mr. A. Brook-Turner, Foreign Office
Mr. I. Smart, Foreign Office

ACTOMIC ACTIVITIES IN ISRAEL
(Previous reference: J.I.C./1058/61) — 17a

I attach a Note containing J.I.B. comments circulated with J.I.C./1058/61.

2. A copy of J.I.B's comments is being sent to the J.I.C. Liaison Officer in Ottawa, who is being told he may pass it to the Canadian authorities.

(Signed) J. J. B. HUNT

17th July, 1961

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Attachment to J.I.C./1103/61

ATOMIC ACTIVITIES IN ISRAEL

J.I.B. Comments on JIC/1058/61

The Prime Minister of Israel has now told the Prime Minister of Canada that the Dimona nuclear complex will include a plutonium separation plant. This admission finally confirms our view that plutonium has all along been a main goal of the second, and formerly secret Israeli atomic programme. It is not, however, so easy to reconcile Mr. Ben Gurion's admission with the assurances from French sources that the plutonium from Dimona would come to France. It may be that the French assurances will prove valid only in respect of reactor fuel elements supplied by France.

2. Mr. Ben Gurion's party gave different figures, both small, for the output of the separation plant; and it seems very likely that no meaningful estimate of the output can be made at this time in so much as the Israelis will have to procure safeguard-free uranium before they can operate the plant at all. Should such uranium become available in adequate quantities, we believe the Israelis will find it technically possible to increase the performance of their plant. The output suggested by Mr. Ben Gurion, like the rating of 24 MW quoted for the Dimona reactor, may be an initial estimate which can later be adjusted if political factors allow.

3. The military implications of Dimona are neither greater nor smaller than before Mr. Ben Gurion's statement. Plutonium in small amounts could perfectly well represent a step on the road to power reactors of an advanced type; but it remains very surprising that a country as small as Israel should have undertaken such a course of development; that it should have undertaken it so soon; and that the programme should be so carefully separated from the overt Israeli programme and so closely linked to the Ministry of Defence. It has been, and remains our opinion, that Israel wanted an independent supply of plutonium so as to be in a position to make nuclear weapons if she wished.

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J.I.C./1058/61

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ATOMIC ACTIVITIES IN ISRAEL

(Previous reference: J.I.C.(61) 22nd Meeting, Item 5)

162.

The
has recently prepared a note commenting on Israel's plans for a plutonium separation plant and drawing some conclusions about the subsequent production of nuclear weapons. A copy of this brief, which was passed to the J.I.C. Liaison Officer in Ottawa by the Secretary of the Canadian J.I.C., is attached for your information.

(Signed) J. J. B. HUNT

10th July, 1961

Attachment to J.I.C./1058/61

COPY

6 June, 1961

INTELLIGENCE BRIEF

Prepared for: JIC
By: DSI
Subject: Israel Plutonium Separation Plant
Source: External Affairs

Dateline of Report: 3 June 1961

Item:

It is reported that in a recent interview with the Prime Minister of Canada, Mr. Ben Gurion stated that a plutonium separation plant would be built at the Dimona nuclear complex in the Negev desert, and that its production would be about 25 grams per year. Later a member of the party accompanying the Israeli Prime Minister quoted a capacity of 300 grams per year.

Comments:

1. The two figures quoted are well within the capacity of a pilot plant. The French pilot plant at Chatillon had a capacity of at least 600 grams per year.

2. A pilot plant is a pre-requisite to a full scale plant. French experience at Chatillon led to the erection of the Marcoule separation plant.

3. Having studied at French nuclear establishments including Marcoule, the Israelis are more familiar with the French plutonium separation programme than with that of the other nuclear powers. It is probable that in using this knowledge they will follow in French footsteps. A plant for the separation of plutonium is the most direct route to nuclear arms.

4. The Israeli reactor at Dimona is expected to be in production around 1963. Because of its low power, 24 MW, it cannot be considered capable of supporting a nuclear weapons programme. It will, however, after an initial run-in period of six months, produce as much as 5 or 6 kilograms of plutonium per year, i.e. more than enough to feed a plutonium pilot plant of a capacity comparable to that of Chatillon.

5. The separation of plutonium can only mean that Israel intends to produce nuclear weapons, for although pure plutonium is used as a fuel in some US and USSR reactors, the technology is so difficult that neither the UK nor France have attempted it. A small country like Israel would certainly not plan to risk its limited resources in such an undertaking.

6. The interest of Israel in a plutonium separation plant is one more indication of her intentions to develop nuclear weapons. Previous indications included her attempts to obtain uranium concentrate and irradiated fuel without safeguards, and the secrecy surrounding her nuclear programme.

7. The separation of plutonium implies that other facilities will be added:-

(a) a uranium metal plant to re-process the uranium after the plutonium has been separated; (such a facility could also treat uranium ore concentrate).

(b) a fuel element production facility;

and eventually,

(c) at least one high power (100 MW or more) plutonium production reactor.

8. While Israel could probably scrape sufficient uranium from indigenous sources to feed its present 24 MW reactor, it still needs an outside source of uranium to which no safeguards are attached in order to produce plutonium on a scale sufficient to support a nuclear military programme.

Conclusions:

1. The plutonium separation plant mentioned by Mr. Ben Gurion is of a pilot plant scale, but quite possibly it could process up to 3 kilograms of plutonium per year. Such a pilot plant cannot support a military programme but it will enable Israel to acquire the required technology.

2. This development is an additional indication that Israel intends to eventually produce nuclear weapons.

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J.I.C./2028/60

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Copy to:- Scientific Adviser (Intelligence), Ministry of Defence

SECRET ATOMIC ACTIVITIES IN ISRAEL 143
(Previous reference: J.I.C.(60)60th Meeting, Item 9)

At their meeting on 1st December the Committee invited the Joint Intelligence Bureau to prepare a paper which would assess in the light of intelligence received about the Israeli nuclear programme.

2. The attached paper has been prepared by J.I.B. as a summary of the intelligence available but is not in a form suitable for issue as a J.I.C. report. J.I.B. are at present in the middle of some and these may clarify some of the outstanding issues. It is also likely that some fresh information may be obtained from It would be difficult to make a good assessment of the implications of the Israeli programme before this further information is received, and the Committee may therefore agree that another week or so should elapse before embarking on a J.I.C. report. In the meantime the attached paper by the Joint Intelligence Bureau provides a fairly complete account of the picture to date.

(Signed) J. J. B. HUNT

8th February, 1960

U.K. EYES ONLY

SECRET ATOMIC ACTIVITIES IN ISRAEL

A Survey of the Evidence to date

6th December, 1960

J.L.B.

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INTRODUCTORY

1. At the beginning of September 1960 the U.K. Embassy in Tel Aviv reported to the Foreign Office a circumstantial story derived partly from an Israeli contact and partly from observation. The gist of the story was that there was a suspicious site in the Negev desert, close to Beersheba, and that it might contain a nuclear reactor. At about the same time photographs of the Beersheba site were forwarded by the Military Attache in Tel Aviv and confirmed that an investigation was needed. Certain were accordingly set on foot and are still proceeding. The purpose of this paper is to set down the main items of information gathered so far and to state what conclusions we think can be placed on them at this stage.

SECTION 1

The overt Israeli atomic programme

2. Israel has an atomic programme which dates back to 1948 and which is administered by an Atomic Energy Commission coming under the Prime Minister's office. Most of the publicised activity related to research where the Israeli effort is quite impressive. The research centres round the Weizmann Institute at Rehovorth, near which there is a small American reactor of no military significance.

3. On the industrial plane the Israelis hope ultimately to utilise nuclear reactors for such tasks as generating electric power, purifying sea water and irrigation. Their plans normally envisage reactors of the natural uranium - heavy water type. However, achievement on the industrial plane has lagged due to nuclear power still being expensive.

4. The declared activities and aims of the Israeli A.E.C. are entirely non-military and there are only individual points which appear suspicious. The chief point might be considered the Rehovoth Conference of 1960 where leading scientists from many countries were given a picture of Israeli activities which omitted all reference to the Beersheba site described below (paragraphs 12 - 15). The Israelis also maintain a lively interest in the industrial production of heavy water which seems somewhat out of phase with the lack of any firm overt project for building a reactor. It is also noteworthy that Ernst Bergmann, Chairman of the Israeli A.E.C., simultaneously heads the scientific department of the Ministry of Defence; and that the Weizmann Institute reactor referred to above was erected with the help of the Ministry of Defence.

SECTION II

Military Interest in Nuclear Programme

5. In 1958 two new appointments were reported in the Israeli Ministry of Defence. Major-General Dan Tolkowsky, previously A.O.C. Israeli Air Force, became responsible to the Minister of Defence and the Chief of Staff for coordinating the

services' requirements from industry; this post was also described as including responsibility for atomic research. At the same time Meir Mardor, previously Director of Development Projects was made Head of an Authority for the Development of Means of Warfare in the Ministry of Defence.

6. In April 1959 Chancery in Tel Aviv reported a reference by Shimon Peres, Director General of the Ministry of Defence to Israeli efforts to obtain a secret weapon (unspecified). Peres was said, about the same time, to be extremely keen to have a nuclear weapon, and confident that the French would supply it; he was also critical of the theoretical nature of the work of the Weizmann Institute. Tolkowsky, on the other hand, had apparently been commissioned to review Israel's atomic policy and his conclusion, backed by the majority of military opinion, was that it would be wise to keep the Middle East free of nuclear weapons. The Israeli Prime Minister thought that Israel ought to concentrate first on a reactor for power production but might later achieve a nuclear weapon of her own.

SECTION III

A Franco-Israeli Nuclear Aid Agreement

7.

8. According to a Franco-Israeli agreement on atomic matters was concluded in 1956. Under its terms the French undertook to help Israel to build in the Negev a research centre including a "powerful" reactor. Blueprints of a reactor "similar to that at Marcoule" were to be sold to Israel. France was to supply all necessary material, and expert advice. Implementation of the agreement started at once, and 50 - 60 Israelis have now received training in various French establishments including Saclay (nuclear research centre) and Marcoule (where the French have their plutonium production reactors and chemical separation plant). Israelis have not, however, received training at any military establishment of the Commissariat a l'Energie Atomique (C.E.A.). The selection of French firms to carry out the work was done by the security department of C.E.A. and the selected firms were required to set up special new branches to deal with Israeli orders in order to preserve secrecy, the Israelis paying the cost of these special arrangements. Within French Government circles the Prime Minister alone knew all the details of the agreement with Israeli and even the Foreign Minister was only generally aware of it; no more than a few members of C.E.A. knew of its existence.

U.K. EYES ONLY

9. In the course of 1960, however, the French are said to have told the Israelis that it was becoming impossible to maintain total secrecy about the agreement; and they have now, after overcoming strong Israeli resistance by a threat to stop deliveries, obtained the Israelis' consent to the issue of a joint communique, which is expected to be published shortly.

10. thinks that the reactor or reactors are, at least potentially, of military significance, but that Israelis could not start production of any kind of atomic weapon for at least two years. It is not clear, however, how much knows about the progress of deliveries under the agreement, or of work at the Negev site. His account contains no reference to the chemical separation of plutonium.

11. The Franco-Israeli agreement as reported by made no mention of safeguards.

SECTION IV

The Beersheba site

12. The site in the Negev by which our attention was originally attracted on a number of occasions though no good aerial cover is available. There is little difficulty in picking up the site since there are no other installations of any kind in its vicinity; it is, in fact in the desert, about half-way between Beersheba and the southern end of the Dead Sea, and one mile south of the Beersheba-Sodom road.

13. In extent the site covers approximately a square mile. Buildings on the northern side visible from the main road include two large sheds (possibly workshops), a three-story rectangular block apparently raised on "stilts" a tall (85 feet) cylindrical structure (possibly a chimney), another cylindrical building of steel construction apparently about 35 feet tall and 70 feet in diameter, with sides not yet completed to its full height (tentatively identified as a reactor building), and a large possibly rectangular building three or four storeys high with windows - about twenty-four in each storey on the longer side. In addition, there are many single-storey buildings which cannot be identified on the existing photography. A high-tension power line (110 Kv) and a domestic supply line lead to the site, but it is not at present rail-served. It lies in an area where underground water may be available.

14. The "reactor building" is reminiscent of that housing a large research reactor at the French Centre of Nuclear Studies at Saclay, but is unlike those in which the French production reactors at Marcoule are housed.

U.K. EYES ONLY

15. The site is incomplete at present, but we cannot yet assess the amount of work still to be done. None of the visible buildings looks like any known plutonium separation plant.

SECTION V

Defence Establishment at Beersheba

16. According to the present Israeli ambassador in Ghana, Ehud Avriel, is to return to Israel to take charge of a "technological university" under the auspices of the Ministry of Defence at Beersheba.

17. Beersheba is a small town (population 45,000) on the edge of the Negev desert. Clearly the number of secret installations it contains will not be great; and the obvious though unprovable speculation is that Avriel's defence "University" equates with the site described in Section IV above. If it does the selection of Avriel as director is especially interesting, since he is known to be a very active and intelligent person with a of high government posts and In the context of such a director, and of Ministry of Defence interest, a nuclear reactor is unlikely to be limited to conventional physical research.

SECTION VI

Purchase of heavy water

18. In September 1958 the U.K. Atomic Energy and the Oslo firm of Noratom negotiated about the repurchase from the A.E.A. of 20 tons of Norwegian heavy water. The water was, however, ultimately required for a customer of Noratom which turned out to be Israel. The Israelis were at some pains to keep this transaction secret.

19. Subsequently, in mid 1959 and mid 1960, the water was shipped to Israel.

20. Twenty tons of heavy water, if used as the moderator of a single reactor, could be adequate for a reactor of about 100 megawatts, that is a reactor large enough to produce significant quantities of plutonium. Such a quantity of heavy water is clearly too large for a single low-power research reactor.

SECTION VII

The Sitte Trial

21. At the beginning of November 1960 the Israelis put on trial the professor of physics at Haifa Technical Institute, one Kurt Sitte. Sitte, who had been arrested five months previously, was charged with passing information to an East European country. However, the full charges against him were kept secret and the trial took place in camera.

U.K. EYES ONLY

22. This incident is without precedent in Israeli history; and under normal conditions neither the teaching of physics nor Sitte's speciality (cosmic rays) are likely to involve secrets of state. However, the Institute where Sitte taught is the main centre of technical training in Israel. It teaches "nuclear engineering", among other subjects, and boasts that it had a reactor simulator before the small research reactor of the Weizmann Institute was in operation. Clearly, the Haifa Institute must play an important part in any Israeli atomic project; and it seems that Sitte's arrest is in some way linked to the activities described in this paper.

SECTION VIII

Israeli resources

23. By and large Israeli domestic resources, especially of money and of supporting industry, are quite inadequate to support a programme of nuclear weapons production; and if such a programme ever exists it will need substantial help from outside. In one respect, however, that of technically trained manpower, Israel is not so badly placed, and it is likely that amongst her numerous intellectuals there are many who could be useful in building an atomic programme. To give one example a Jerusalem Professor of Physics called Solly Cohen participated in the wartime British atomic programme, as a member of the Montreal reactor group. Cohen is an able man, and quite competent to direct the construction of a heavy water reactor.

24. It may be noted that the Israeli authorities instituted enquiries about the reliability of Cohen at the time when the Sitte trial (paragraphs 21 - 22 above) opened.

SECTION IX

A U.S. report on Israeli developments

25. During the preparation of this paper a Israeli atomic developments was received. The Americans claim that a big (200 MW) reactor and a plutonium separation plant are being built at Beersheba: and they speculate that Israel would be able to conduct a weapon test in late 1962 or early 1963.

26. The Americans, like ourselves, have in arriving at their findings: and it is therefore difficult to criticise their statement fully. Our initial reaction is to doubt that any such reactor as that described by the Americans either exists now or is in any advanced state of construction at the site

27. We are endeavouring to clarify the position

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SECTION X

Conclusions

28. The findings set out in the above paragraphs are not adequate to make possible a full judgement as to Israeli secret atomic activities or their purpose.

29. Four main conclusions emerge.

(i) There has been secret Franco-Israeli collaboration on atomic energy.

(ii) The site near Beersheba, described in paragraphs 12 - 15 above is indeed an atomic site, including a reactor, and probably equates with the research institute to be built under a Franco-Israeli agreement.

(iii) At present the Beersheba site does not resemble a complex for producing fissile material. Unless the Marcoule type reactor, mentioned in the Franco-Israeli agreement, together with a plutonium reparation plant are already well-advanced at some other secret Israeli site (and this seems doubtful) Israel does not have any fissile material and will not have any for at least two years, which we estimate to be the minimum period required to add the appropriate facilities to the Beersheba site.

(iv) There are indications that, despite the Franco-Israeli agreement, French and Israeli ideas about Israeli atomic programme may be different. For instance the Israelis did not wish to publicise their agreement with France; and they have sought advice and assistance outside France.

30. It is not possible at this stage to offer any firm opinion as to ultimate Israeli intentions. More yet needs to be found out; and above all it is necessary to find out what arrangements are envisaged for the processing of the reactor fuel from present or future Israeli reactors. If this fuel is to be treated in Israeli or, alternatively, if it is to be treated in France but the plutonium extracted is to be returned to Israel without safeguards, then Israel will begin to accumulate fissile material from which nuclear weapons could be made. Assuming that the Beersheba reactor is so far the only sizeable reactor in Israel (this seems likely) and assuming further that it is a big heavy water reactor (this we do not know) it could make enough plutonium for, say, six nuclear weapons a year. The "Marcoule" type reactor, for which the Israelis were to buy blueprints, would provide plutonium for up to twelve nuclear weapons a year. Actual fabrications of nuclear weapons from the plutonium could take the Israelis anything from three months to three years depending on how much help they received from outside.

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