

SS-S&R-Sc
File No. 72

~~RESTRICTED~~

3414
F

HEADQUARTERS
FIRST TECHNICAL SERVICE DETACHMENT
G.H.Q., AFFAC, ADV., A.P.O. 500
SAN FRANCISCO, CALIF

30 September 1945

SUBJECT: Summary Report, Atomic Bomb Mission, Investigation
into Japanese Activity to Develop Atomic Power.

TO : Brig. Gen. J. E. Newman

DECLASSIFIED
EO 11652, Sec. 3(E) and 5(D) or (E)

CSD Letter, May 6, 1972

DATE 10-3-75

I. SUMMARY.

A. A summary of the position of the Japanese scientific effort in the field of nuclear physics as found by this mission is briefly stated below:

1. Normal research was conducted until 1943.
2. Activity was continued on a reduced scale after 1943 because of difficulties over priorities, manpower, evacuation, and diversion to war research which was of direct interest to the military who sought to evade or at least lessen the effect of air raids upon their military forces and homeland.
3. Activity increased after the August 6th Hiroshima bombing. Some of this interest has appeared to be other than medical.

B. A brief summary of the Japanese effort to obtain project materials is as follows:

1. Mines were concentrated on essential materials, iron, copper etc., to ease severe shortages.
2. The second consideration was the mining of rare elements needed for radio vacuum tube production, --monasite, zircon, tantalum.
3. One shipment of three tons of fergusonite, containing a low percentage of U₃O₈, was still incomplete at the end of hostilities.
4. Geological surveys apparently failed to disclose new sources of uranium to the Japanese within the territory under their military control

II. PERTINENT INFORMATION DEVELOPED.

A. The government and the military gave no priority to research in the field of nuclear physics and had no program to produce a bomb.

RESTRICTED

3414

~~RESTRICTED~~

Summary report Atomic Bomb Mission dtd 30 Sep 45 Cont'd

B. The principal nuclear physicists were diverted to other research work, such as medicine or the development of vacuum tubes for the radio and electronics industry.

C. Science in Japan was organized, but it was organized behind existing industries to solve the immediate development production problems of these industries, particularly in regard to providing those industries with substitute materials to relieve critical shortages which were many. A great emphasis was placed on the development of radar, a field in which they were well behind the rest of the world. They needed radar desperately to ward off the continual raids upon their homes and armed forces.

D. No new laboratory equipment has been found or been reported which was not acquired prior to about January 1943 when normal research activity was diverted into the special immediate problems of industry. Laboratories have remained small and are presently poorly equipped, often with homemade equipment. The type of equipment found has been that which one would expect to find in nuclear research laboratories in the United States before the war which operated on university funds in the field of pure science. No evidence of the expenditure of military funds for new equipment was found.

E. Research of importance to the military has been evacuated to the country to avoid bombing. The vacuum tube research work was conducted in the country, but, the nuclear research work remained in Tokyo. This clearly indicates the low priority assigned to this work. Lack of government interest is again borne out by the fact that repairs for the cyclotron were not made when the machine was rendered inoperative by the April bombing.

F. Government interest did develop after the Hiroshima bombing and physicists have been at work since that date not alone on the medical aspects of radiation but directly on the problem of how the bomb works and what mass of U235 was employed.

G. While it can not be said definitely as yet, it does appear likely that the Japanese scientists used only the uranium materials acquired from Europe before the war for their experiments. One small bottle of this uranium material was found in Mishina's laboratory.

H. The Japanese would be able to organize a group of twenty first-class scientists capable of initiating a project for the production of atomic energy. They have the theoretical background. They could progress rapidly to the point of production, especially

~~RESTRICTED~~

Summary report Atomic Bomb Mission dtd 30 Sep 45 Cont'd

if they were given the results of the work in America in any detail. They appear to have the interest necessary to form such a plan. Nishina would probably be the center of this activity.

I. Incomplete geological information from university sources has indicated that the Japanese have no source for project materials either in Japan or in Asia beyond the minute quantities in Honshu and Korea. These sources have been a matter of record for some time. However, it has appeared likely from recent interviews that the military may have additional data. This information is presently being sought.

J. Three tons of stocks containing fergusonite had been stored by Kikken at Jinsen, Korea, for shipment to Tokyo. The extraction of uranium content of these ores was anticipated for use in atomic energy experiments in progress at the Kikken laboratories. The fergusonite was said to contain 4% U_3O_8 , which would amount to 120 kilos. This would necessarily be the maximum content since the stocks were said to contain a large amount of foreign matter. These stocks reported by the Korean members of Kikken were unreported in any documents or interviews obtained elsewhere. It was claimed to be the first shipment of this kind and the only shipment planned from any other mining company here.

K. 300 kilos of euxenite were imported from Manchuria and refined for the tantalum, niobium and yttrium content. The 7% U_3O_8 content, perhaps 20 kilos, was said to have been wasted. Available information about the mine from which this euxenite was extracted has been reported in some detail in the Appendix. These two occurrences have appeared to be the only reported Japanese sources of U_3O_8 since before the war.

L. One of the by-products of large scale gold and monasite mining operations in Korea is a small amount of fergusonite, said to contain up to 4% U_3O_8 , which can be obtained if expense in separating this material is no object.

M. There appears to be a relatively undeveloped source of monasite in the beach and river sands of Korea. Getting important amounts of monasite from these sands is dependent upon completion of large-scale separating plants and the development of large-scale refining techniques. To get large amounts of monasite would require direct mining for this mineral rather than relying upon the production of monasite as a result of gold production.

N. A minor source of U_3O_8 might be obtained from the large content of zircon also contained in the beach and river sands. The existence of U_3O_8 in Korean zircon has not been determined as yet by the Japanese except in the case of one specimen analysis

~~RESTRICTED~~

Summary report Atomic Bomb Mission dtd 30 Sep 45 Cont'd

of naegit, which appeared to receive only academic interest in mineralogical records.

O. The Japanese apparently explored Korea and Manchuria for all basic minerals, and, to a lesser extent, for the rare earths and metals. Emphasis was placed, first, upon increasing the production of existing mines and, second, upon developing new resources. The interest in rare metals actively increased during the last two years of the war. The Japanese interest in Manchuria for rare elements is less known to this Mission than the effort made in Korea. The geological records available in Korea do not as yet contain indications of the existence of important sources of rare elements in Manchuria which were hitherto unknown to the United States. As each locality has retained unpublished detailed reports and surveys within its boundaries, precise and complete information on Manchuria must wait examination of the Geological Survey Office reference now understood to be at Harbin, Manchuria, in Russian territory.

P. It was not possible to collect good evidence about resources in Japanese-occupied China. However, Japanese geologists and mining authorities made negative statements as to the existence of resources of rare earths in China.

Q. 3,000 to 5,000 tons of Monasite were imported into Japan from the Malays during the war. An unknown quantity of zircon also came from this country. Tin, however, appeared to be the objective, and if Japanese statements are true, no effort was made to obtain rare earths from the Malays other than to import British monasite stocks.

III. SECURITY CONTROL.

Attention is invited to directive No. 3, issued by the Supreme Commander, AFMAC (See Appendix for copy) and particularly to that part of this directive which is devoted to the restrictions placed upon atomic physics research in Japan. The groups over whom control should be exerted are as follows:

- The Nikken group, under Y. Nishina.
- The Tokyo Imperial University group, under H. Sagane
- The Kyoto Imperial University group, under H. Yukana, a theorist, and E. Arakatsu, an energetic experimenter.
- The Osaka Imperial University group, under S. Kikuchi

R. R. PURMAN
Major, C. E.