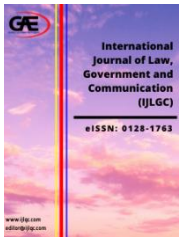
International Journal of Law, Government and Communication
EISSN : 0128-1763
Volume 7 Issue 30 (December 2022) PP. 87-109
DOI 10.35631/IJLGC.730009



INTERNATIONAL JOURNAL OF LAW, GOVERNMENT AND COMMUNICATION (IJLGC)
www.ijlgc.com

ACQUISITION OF RARE EARTH MINERALS FROM MALAYA IN VIOLATION OF EXPORT CONTROL LAWS FOR JAPAN'S ATOMIC RESEARCH DURING WORLD WAR II

Marina Abdul Majid[1*]

[1] Research Centre for History, Politics and International Affairs, Faculty of Social Sciences and Humanities, National University of Malaysia (UKM), 43600 Bangi, Selangor, Malaysia.
Email: marina76@ukm.edu.my/marinamajid76@gmail.com
[*] Corresponding Author

Article Info:

Article history:
Received date: 21.09.2022
Revised date: 16.10.2022
Accepted date: 23.10.2022
Published date: 21.12.2022

To cite this document:

Abdul Majid, M. (2022). Acquisition Of Rare Earth Minerals From Malaya In Violation Of Export Control Laws For Japan's Atomic Research During World War II. *International Journal of Law, Government and Communication, 7* (30), 87-109.

DOI: 10.35631/IJLGC.730009.

Abstract:

During World War II (WWII) from 1941-1945, the Japanese sought to obtain uranium and thorium from Malaya meant for its atomic research. This may violate international export controls or the domestic laws of the United States (US) and the United Kingdom (UK). The main objective of this study is to investigate the extent of the Japanese acquisition of uranium and thorium in Malaya for its atomic research during WWII which may or may not have violated international or domestic export control laws of the US and UK. This qualitative study used a textual analysis for interpreting bilateral and trilateral agreements to secure uranium and thorium, the export control laws of the US and UK, and a case law. Other documentation concerning Japanese procurement of amazing in Malaya was referred. Secondary resources of books, book chapters, conference papers, journal articles, newspapers, magazines, and internet materials were also analyzed through content analysis. The write-up for this study is narrative as this study relates to history, law, and security studies. The results of this study indicate the Japan Nitrogen Company based in Malim Nawar had produced carbide, ammunition and ammonia. While this company's branch in Hŭngnam, North Korea had been scouting for minerals for Japan's atomic research, it is unknown if the unit in Malaya also played the same role. Amang was shipped to Japan for the extraction of monazite which in turn returned thorium and uranium were used for atomic research but some were sunk at sea or confiscated as war bounty by the US. Penang Island became a transit point for uranium sent by the Germans to the Japanese. The US and the UK export control laws were the most applicable in restricting Japan from acquiring uranium and other minerals for atomic research as international controls were just emerging and applicable among a few selected countries to yet become an accepted norm multilaterally.

International Journal of Law, Government and Communication
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IJLGC
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Keywords:

Export Controls, Uranium, Thorium, Atomic, Malaya, Malim Nawar, *Amang*

Introduction

Throughout the period of World War II (WWII) from 1941-1945, Japan, a member of the Axis power besides Germany embarked on atomic research with the goal of creating its own atomic bomb (Dower, 1978; Ii, 2016, p. 19; Wilcox, 2019). Japan's ambition of creating its own atomic bomb though was hampered as it lacked uranium within its own country. In overcoming this setback, Japan sent geologists to locate uranium among its colonies which included Hŭngnam (Kōnan) in now North Korea as well as Malaya (Wilcox, 2019). Uranium was needed as it was essential for uranium enrichment, a process required for building an atomic bomb.

When North Korea formed part of Japan's colony during WWII, the Japan Nitrogen Company (*Nippon Nitrogen Kaisha*) was involved in assisting Japan in exploring areas that could possibly contain uranium. This same Japan Nitrogen Company was also said to open branches in Southeast Asia and specifically Malaya (Kurahashi, 2003, p. 319; Miyamoto, 2021). Where exactly the location of the Japan Nitrogen Company in Malaya and whether it was ever involved in the search for uranium for Japan's ambitious goal of atomic research remains a mystery and needs further exploration. Part of this study will seek to explore the role that the Japan Nitrogen Company actually played in Malaya during WWII and whether it had ever assisted in some way towards Japan's atomic research.

Japan's quest of obtaining uranium had led this country to locate *amang* (black sand), which was tin tailings residue that contains monazite from which it could extract uranium and thorium in parts of Malaya where tin mining occurred (Dower, 1978, p. 49; Hosaka, 2012; McRae, 2014). This *amang* in large quantities was being exported back to Japan partially for its industry and also for atomic research (Dower, 1978; Ii, 2016, p. 19; Wilcox, 2019). Exactly who was responsible for importing this *amang* to Japan, its storage place and its fate after WWII ended has not been described in detail which leaves this study to fill in the gap.

Besides obtaining *amang* to extract uranium and thorium, Penang Island in Malaya was also a transit point for receiving uranium from Germany which was sent by submarines (Baudzus, 2006; Bryen, 2017; Child-Dennis, 2018). The uranium would then be transferred to Japan. While some uranium had made it to its final destination in Japan, the Allied navy sunk or held certain German submarines that were known or on suspicion of carrying uranium for Japan.

While Japan embarked on the course of obtaining uranium and thorium for its atomic research, this has raised the legality of its actions at the international level in obtaining the said minerals for the nefarious purpose of creating an atomic bomb. Therefore, throughout the period of WWII, there is a need to inquire whether export control laws were already in place to a limited extent or implemented extensively through a multilateral channel of an international organisation to prevent Japan and Germany from obtaining uranium and thorium for the creation of an atomic bomb. If export controls were non-existent at all from 1941 through 1945, this would have made it far easier for Japan and Germany to obtain the said minerals and these countries could have developed their atomic bomb fastidiously. On the other hand, if export controls were already in place albeit even to a limited extent, Japan would have faced a hindrance in obtaining the precious minerals to delay its goal of creating an atomic bomb. Japan

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would have to embark on clandestine operations to obtain these minerals away from the prying eyes of the Allies. During WWII though, the Allies consisting of the United States (US) and the United Kingdom (UK) made every effort to secure the supply of uranium and thorium from countries extremely rich in these minerals through bilateral and trilateral agreements among a few selected countries. However, there was still a majority of other countries from which Japan especially could have obtained uranium and thorium since they were non-parties to the Allied powers' bilateral and trilateral agreements. Moreover, Japan which took over most of the UK's colonies in Southeast Asia including Malaya could have explored for uranium and thorium freely as Japan was the new colonial master. Thus, it arises whether the Japanese quest in obtaining uranium and thorium for its atomic research not only from Malaya but also utilising this colony as a point of transit could have been illegal during WWII provided that export controls at that time were extensive enough to forbid Japanese actions. Therefore, this study has the main objective to investigate the extent of the Japanese search for uranium and thorium in Malaya for its atomic research during WWII using this colony as a point of transit for the importation of these minerals which could have been legal or illegal depending on the imposition of export control laws during that period of time.

Literature Review

During WWII, the Japanese army who invaded Malaya also exploited this colony to further their aims of creating an atomic bomb through atomic research in a number of ways.

Unknown to many local Malaysians during WWII, the Japan Nitrogen Company had set its base in Malaya. Few scholars such as Kurahashi (2003, p. 319) had mentioned that the Japan Nitrogen Company also known as *Nichitsu* had a branch in Southeast Asia while Miyamoto (2021, p. 26) specifically mentioned *Nichitsu's* expansion into Malaya. While in Malaya, not much has been written about the Japan Nitrogen Company as scholars such as Kratoska (1997, p. 180) mention the setting of this factory in July 1943 to produce carbide and another facility to produce ammonia was unfinished. Nasution-Khoo and Lubis (2005, p. 155) mention the specific location of the Japan Nitrogen Company to be based in Kampung Tanjung Bakong, Tualang Sekah, Malim Nawar in the state of Perak, Malaya. Nasution-Khoo and Lubis (2005, p. 155) mention that this factory had produced explosives and specifically carbide to be supplied to the Japanese army. Moreover, Nasution-Khoo and Lubis (2005, p. 155) also indicated the Japanese employed a majority of Malays and a minority of Indians and local Chinese. Bradley (2012, pp. 72 – 73) though provides far more details about this Japan Nitrogen Company as he indicates the production of rifle bullets, artillery shells, machine gun parts, marine engine parts, gunpowder and hand grenades to be supplied to the 29th Japanese army stationed in Taiping, Perak. Bradley (2012, pp. 72 – 73) also mentions that the Japanese were secretive about the work performed at the Japan Nitrogen Company as the locals who served at this factory were kept in the dark about the true Japanese activities. This raises a salient query about the reason the Japanese were so secretive about their activities in this factory beyond the production of ammunition, carbide and ammonia. Elsewhere in now Hŭngnam (Kōnan) in North Korea, formerly a Japanese colony too, the Japan Nitrogen Company had been known to scout for minerals meant for Japanese atomic research namely uranium, thorium and monazite (Grunden, 2015, pp. 6 -7; Streifer, 2018, p. 49). A remote possibility that this same company could have assisted in scouting for minerals for Japan's atomic research in Malim Nawar garners an exploration in this study to fill in an unknown gap.

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Besides the mystery of the Japan Nitrogen Company's activities having any links to its atomic research in Malim Nawar, more literature exists among scholars about the Japanese acquisition of *amang* for the extraction of thorium and uranium from Malaya (Abiorensen, 1995, p. 18; Dower, 1978, p. 49; Ii, 2016, p. 19; Hosaka, 2012; Kaji, 1999; McRae, 2014; Wilcox, 2019). While these scholars have briefly mentioned the Japanese syphoning *amang* from Malaya for their atomic research, much remains unknown about the fate of the *amang* whether all of it was being used for Japan's atomic research or ended up elsewhere for some other utilisation. This requires this study to delve further into the fate of the *amang* by referring to past documentation with regard to its details as other scholars in cursory have touched upon this subject to fill the existing gap.

With regard to Malaya being a transit point for the disembarkation of uranium by the Germans who subsequently transferred this mineral to Japan for the latter's atomic research, a few scholars have supposedly assumed that the German U-boat, U859 which was an I – class submarine could have been carrying uranium mixed with mercury when it was sunk off the coast of Penang Island (Baudzus, 2006; Bryen, 2017; Child – Dennis, 2018, p. 34). Whatever happened to the fate of the mercury which supposedly could have been mixed with uranium remains a shrouded mystery that deserves further deliberation in this present study since previous scholars have not provided extensive details about its fate.

While Japan was trying its best to acquire uranium and thorium for its atomic research, there is a need to situate this country's actions whether in any way it had violated export control laws that could have been applicable during WWII. Some scholars (Anstey, 2014, pp. 2 – 4; Binnie, 2003, p. 94; Roitto, Nevalainen & Kaarkoski, 2020, pp. 7- 8) have referred to the Combined Development Trust (CDT) formed in 1944 among the Allied powers of the US and UK to restrict the export of uranium to Russia, Germany, and other enemies of the Allied countries which could have used this mineral for the purpose of creating an atomic bomb. Through the CDT, bilateral and trilateral agreements were brokered among selected countries such as Belgium, Brazil, Portugal, the Netherlands, India, South Africa and Australia to secure uranium and thorium so that these minerals would not have fallen into Allied enemies' hands to enable them to create an atomic bomb. An early form of export controls was formed among a few selected countries merely to control raw earth minerals from being used for nefarious purposes but not on a large scale at a multilateral level to be an accepted norm of prohibition. This raises the issue of whether international export controls during WWII would have made Japan's actions of acquiring uranium and thorium in Malaya illegal or would have the US and UK's domestic law of export controls to be more applicable. Thus, it is the task of this study to deliberate on this said issue and evaluate whether international export controls or the US and UK's domestic laws during WWII would have made Japanese actions illegal.

Bearing the above in mind, this study will attempt to provide sufficient answers to the identified gaps, already mentioned in the results section of this study.

Methodology

This is a qualitative study. Being a multidisciplinary study that combines the discipline of history, security studies and law, a socio-legal approach has been adopted. Since social science methods of analysis such as textual and content analysis have been used in this study, it is also feasible to adopt a socio-legal approach. A doctrinal research approach is also relevant to this study because an analysis of provisions has been conducted among bilateral and trilateral

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agreements between the Allied powers prohibiting uranium and thorium from being exported to enemy countries such as Germany, Russia and others, a case law and the statutes of the US and UK concerning export control laws during WWII.

Among the bilateral and trilateral agreements which have been referred to include:

i) Agreement between the United States and the United Kingdom for the Establishment of the Combined Development Trust (CDT) of 13 June, 1944;
ii) Agreements between the United States and the United Kingdom and between the United States, the United Kingdom, and Belgium regarding the Acquisition and Control of Uranium dated 26 September, 1944;
iii) Memorandum of Agreement between the United States of Brazil and the United States of America dated 10 July, 1945.

Among the relevant statutes which this study referred to had encompassed:

i) The Import, Export and Customs Power (Defense) Act of 1939 in the UK; and
ii) The Export Control Act of 1940 in the US.

The following case law was also referred to namely:

i) *Simon v Taylor and Others*, dated 1975 - This case law is relevant with regard to the German disputed submarine U-859 which sank off the coast of Penang Island carrying valuable mercury and supposedly uranium which could have been undisclosed.

A textual analysis of interpreting relevant provisions to the discussion of export controls had been applied among the bilateral and trilateral agreements, the case law mentioned and the export control statutes of the US and UK during WWII to obtain their ordinary meaning.

Other primary documents to which this study referred include the Jeffries Report of November 1944 in the US, on the Nippon Rare Element Control Association (*Nippon Kigenso Tosei Kumiai)*, the *Riken Noson Kogyo* and other historical documents obtained from the US National Archives and Records Administration at College Park, Maryland (MD).

Besides this, a content analysis is used to analyse secondary resources such as books, book chapters, journal articles, conference papers, magazines, newspapers and other relevant information obtained from the internet.

Part of this study also adopts a historical approach defined "as the process of critical inquiry into past events to produce an accurate description and interpretation of those events" (Wiersma, 1982). A historical analysis is therefore relevant to this study too as it is "a method of examination of evidence in coming to an understanding of the past […] contained in documents (Bricknell, 2011, p. 108). The write-up process of this study is one that is descriptive and narrative being typical for the discipline of law and history in the humanities.

A period from 1941-1945 covering the duration of WWII has been chosen in this study because this was when the Japanese army officially occupied Malaya and began their quest to obtain

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thorium and uranium for their atomic research. By 1946, the UK once again occupied Malaya, taking over from the Japanese to occupy its former colony.

Results of The Study

This section will be divided into a few sub-sections namely i) The Japanese carbide chimney and its links to Japan's atomic bomb effort, ii) The quest for *amang* and monazite in Malaya meant for the atomic bomb, iii) Penang Island as a transit point for uranium *en route* to Japan, and iv) Japan's acquisition of rare earth elements and the state of export control law during WWII.

The Japanese Carbide Chimney and Its Links to Japan's Atomic Bomb Effort

In a village called Kampung Tanjong Bakong within the town of Malim Nawar, Perak there is a historical Japanese carbide chimney (see Figure 1) built during WWII which is now a tourist attraction. The remnants of this chimney were actually meant to be part of a bigger Japanese factory producing explosives for the army which was first built in July 1943 (Nasution-Khoo & Lubis, 2005, p.153). The Japan Nitrogen Company was responsible for building the factory and it was anticipated that the factory would also produce ammonia once it was fully completed (Kratoska, 1998, p. 180). Towards the end of WWII in August 1945, the Japan Nitrogen Company merely managed to produce 100 tons of carbide (Kratoska, 1998, p. 180). The production of carbide utilised the labour of 400 civilian workforces mostly consisting of Malays from the nearby villages with fewer Indians and Chinese (Kyra, 2013; Nasution-Khoo & Lubis, 2005, p.153). Indeed, one villager known as Hassan Din seems to confirm that the old chimney during the Japanese days was erected to produce carbide with many women being employed (Kyra, 2013). Hassan Din also worked to process carbon meant for ammunition that would be used in the Burma campaign (Kyra, 2013). Another villager, Chai Weng Huat indicated that the chimney could be a Japanese watch tower or used for carbide processing to produce ammunitions (Loke, 2011). Initially, there were two kiln chimneys but one was supposedly destroyed by a group of communists after the war (Kyra, 2013; Loke, 2011).

Figure 1: The Japanese Carbide Chimney on the right at Kampung Tanjong Bakong, Malim Nawar, Perak

Source: (author's taken photo)

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The said activities of the Japan Nitrogen Company at Malim Nawar indeed provide some clues of its origins in Japan and its branch in North Korea, then under Japanese colonialism. The parent company in Japan was formed by Noguchi Jun and was known as the Japan Nitrogenous Fertilizer Company (*Nippon Chisso Hiryō*, in short *Nichitsu*) (Grunden, 2015). Other authors such as Yang (2006, p. 95) have simply referred to the *Nippon Chisso Hiryō* or *Nichitsu* in North Korea as the Japan Nitrogen Company by another name which is similar to that used in Malim Nawar, Perak. In North Korea, the city port known as Kōnan (presently called Hŭngnam) became central to *Nichitsu's* activities as Noguchi had built a few state-of-the-art factories meant to produce nitrogen-enriched fertilizers, ammonium, magnesium metal, as well as munitions (Grunden, 2015, p. 4). Indeed, the activities of the Japan Nitrogen Company at Malim Nawar in producing explosives and carbide, and its future project of producing ammonia that never was realized is similar to its branch in North Korea, under Japanese domination during WWII. The branch in North Korea was called the Chōsen Nitrogen Fertilizers at Kōnan (*Chōsen Chisso Hiryō*) (Kurahashi, 2003, p. 319). Few scholars (Kurahashi, 2003, p. 319; Miyamoto, 2021, p. 26) have even highlighted that *Nichitsu* during the 1940s had expanded its activities to Southeast Asia which included Malaya. One German publication called Review of the Chemical Industry: Japan (*Rundschau Der Chemiewirtschaft: Japan,* 1942) which was published by the Economic Group Chemical Industry (*Wirtschaftsg Ruppe Chemische Industrie*) specifically indicated that the *Nippon Chisso Hiryō K.K.* had received an order by the higher authorities in Japan to start the production of nitrogen fertilizers in Malaya and Borneo. Exactly where the *Nippon Chisso Hiryō* had established itself in Malaya all this while has remained a mystery. However, the activities of the Japan Nitrogen Company at Kampung Tanjong Bakong, Malim Nawar in Perak which is so similar to that of the *Chōsen Chisso Hiryō* in North Korea seem to suggest that the *Nichitsu's* branch in Malaya was based at Malim Nawar.

In now present Hŭngnam, North Korea, the *Chōsen Chisso Hiryō* during WWII had assisted the Japanese war effort in searching mineral ores which might contain traces of uranium for Japan's quest to create its own atomic bomb. The Imperial Japanese Navy (IJN) of Japan had its own atomic bomb project called F-Go which was headed by Professor Arakatsu Bunsaku from Kyoto Imperial University (Dower, 1978, p. 49). One of the obstacles for Japan in realizing its creation of the atomic bomb was the procurement of uranium. In this context, the Japan Nitrogen Fertilizer Company – JNFC and also known as *Nichitsu* employed the geologist, Takubo Jitsutaro to survey Manchuria and North Korea in the quest for uranium ores (Ii, 2016, p. 19). Furthermore, *Nichitsu* in North Korea had recruited Japanese, Korean and Manchurian nationals to conduct mineral sample surveys that might just contain radioactive elements and sent them back to *Nichitsu's* office for further analysis. Fergussonite was found in North Korea and about three tons of it which contained 4% uranium-235 amounting to 120kg was shipped to Japan (Ii, 2016, p. 19). Moreover, the IJN also found uranium ores in the hills above Kōnan.

Purportedly, the JNFC – *Nichitsu* in North Korea is also a source of heavy water needed as a neuron moderator to sustain a chain reaction with uranium-235. This heavy water came from *Nichitsu's* hydroelectric power project in Hŭngnam and Fusenko. Heavy water was obtained as a by-product of ammonia production for explosives as it is recalled that *Nichitsu* in North Korea was involved in ammonia production and explosives, very much similar to the Jaspan Nitrogen Company in Malim Nawar, Perak, Malaya.

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Noteworthy, it is also this *Nichitsu* in Japan which would be later known as *Chisso* that would be responsible for the Minamata disease concerning deformities to individuals who had consumed fish contaminated with mercury which was discharged by *Chisso* in the Minamata Bay of Japan (Kurahashi, 2003, p. 319). This culminated with the Minamata Disease Trial in the 1960s in Japan with *Chisso* taking action to install a secure cycle system that prevented mercury from being discharged with other by-products (Kurahashi, 2003).

With the checkered history of activities by *Nichitsu* in North Korea and Japan, it is very fortunate that the Japan Nitrogen Company in Malim Nawar, Perak did not have the opportunity to further expand its factory until the end of WWII. The Japan Nitrogen Company throughout its existence from July, 1943 till the end of WWII had merely produced carbide by soliciting assistance from local villagers residing at Malim Nawar, Perak. Since Japan, during WWII, was actively importing and syphoning *amang* which mostly came from the Kinta Valley in Perak and included Malim Nawar which was famous for tin mining (Nasution-Khoo & Lubis, 2005), the presence of the Japan Nitrogen Company within this vicinity is indeed suspicious. It remains unknown if the Japan Nitrogen Company was ever intended to assist in refining *amang* to obtain monazite which may contain traces of uranium that might be useful for Japan's ambition of creating an atomic bomb. Fortunately, the Japan Nitrogen Company left Malim Nawar at the end of WWII or it would be most unfortunate for the villagers nearby to be subjected to any of its unsavoury activities which would not only be harmful to health but the environment too as in the case of Minamata in Japan or those in Kōnan, North Korea presently.

Figure 2: Remnants of Carbide from Japanese Activities during WWII at Kampung Tanjong Bakong, Malim Nawar, Perak

Source: (author's taken photo)

The Quest for Amang and Monazite in Malaya Meant for the Atomic Bomb

The Imperial Japanese Army (IJA) in their quest to pursue nuclear research had worked with its prominent physicist, Nishina Yoshio from the Institute for Physical and Chemical Research (*Rikagaku Kenkyujo* or RIKEN) in April, 1941 (Grunden, 2015, p. 6). A new form of weapon was needed to beat the Allies during WWII as Japan was already on the losing side by the summer of 1942 (Grunden, 2015, p. 6). Being desperate, the IJA established its own nuclear project called Ni-go with the aim of creating an atomic bomb. RIKEN in the outskirts of Tokyo became the central research centre for the IJA's nuclear project. At the RIKEN, physicists conducted bench-scale laboratory experiments to enrich uranium. Nevertheless, Nishina who headed this nuclear research project was handicapped as there was a lack of uranium for enrichment. Nishina was quoted to have said, "in the first place, we haven't as much uranium as you have in Australia, certainly only a fraction of what they have in Canada, and we didn't have enough qualified scientists, either" (Stanley, 1945, p. 2).

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Facing this drawback, Nishina turned to another prominent physicist at RIKEN known as Satoyasu Iimori who also had his own lab at RIKEN known as the *Iimori Ken Kyushitsu*. This research lab of Iimori would later be expanded as the Riken Rare Element Industry Co. (*Riken Kigenso Kougyou Kabukshikigaishe*) in 1935 which would acquire monazite and other rare elements from the Korean Peninsula, Manchuko and the Malay Peninsula (Ii, 2016, p. 19). Nishina had requested that Iimori should assist him in acquiring uranium from Japan's newly conquered territory in the Far East. Iimori was provided by the IJA's Aeronautics Department with 1,500,000 yen (US$375,000) to conduct a geological search of the required ore among the regions identified (Ii, 2016, p. 19). Through Iimori's help, the IJA managed to acquire about 3,000 – 5,000 tons of monazite from the Malay Peninsula that was imported into Japan (Ii, 2016, p. 6). Even prior to WWII, Japan was already acquiring monazite from the Malay Peninsula through the importation of *amang*. For instance, in 1933 Japan imported several consignments of *amang* from the Malay Peninsula (Overstreet, 1967, pp. 62 – 63). This amounted to 250 tons whereby 70 – 80% were ilmenite while the remainder was a mixture of minerals that included monazite (Overstreet, 1967, p. 63). Throughout the period from 1944 – 1945, the Japanese army who conquered Malaya purportedly produced 220 tons of monazite and 200 tons of mixed-monazite-zircon concentrate from these residues (Overstreet, 1967, p. 63). Leading the expedition in 1942 to the Far East in the quest for rare elements to acquire uranium for Japan's nuclear research was also General Tada Reikichi (1883 – 1956) who was the Chairman of the Technology Board being formed by the Japanese Cabinet in 1942 (Nish, 2011, p. 15). This expedition of 1942 to the Far East was indeed auspicious as the Japanese discovered an abundance of rare elements in Burma and Malaya. General Reikichi himself acquired his Doctor of Engineering from Tokyo University and entered the Army Research Centre (Nish, 2011, appendix). Most of the monazite and *amang* that was acquired by the IJA in the Malay Peninsula came from the Kinta Valley and Kuala Lumpur which was rich in tin. However, US submarines soon attacked the Japanese ships which brought back the monazite and *amang* from the Malay Peninsula to disrupt the minimal supply of rare elements to acquire uranium for Japan's nuclear research.

In Japan, the Liquidation Office of the Nippon Rare Element Control Association *(Nippon Kigenso Tosei Kumiai Seisan Jimusho)*, formed in October, 1943 by 46 members was tasked to expedite the import and distribution of rare earth-bearing ores, in particular monazite (Nakaya, 1946). Most of the monazite managed by the *Nippon Kigenso Tosei Kumiai* and *amang* came from North Korea and Malaya (Nakaya, 1946). Notably, most of the *amang* and monazite were held at certain plants in Japan namely:

i) Osaka Seirenjo of the *Mitsubishi Kogyo K.K.*
ii) *Riken Arakawa Kojo* – later moved to Ishikawa-kojo, Fukushima-ken when the Allies bombed the Arakawa facility
iii) Inasa-kojo of the Association *(Nippon Kigenso Tosei Kumiai)* at Kiga-machi, Inasa-gun, Shizuoka-ken (Nakaya, 1946).

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Table 1: The Ores Owned by the *Nippon Kigenso Tosei Kumiai* as of 31 March, 1947(Reproduced)

Ore & Source	Purity	Quantity	Location of Stocks
Monazite (Malayan)	90%	35,300kg	*Nippon Kigenso Tosei Kumiai* - Inasa plant 34,000kg
Monazite (Malayan)	80%	10,000kg	*Riken Noson Kogyo K.K.* – Ishikawa plant 10,000kg
Monazite (Malayan)	60 – 80%	18,700kg *4,000kg sold to a refinery elsewhere	*Mitsubishi Kogyo K.K.* - Osaka refinery 4,700kg *Nippon Kigenso Tosei Kumiai* – Inasa plant 10,000kg
Monazite (Malayan)	50%	25,000kg	*Riken Noson Kogyo K.K.* - Arakawa plant 5,000kg *Mitsubishi Kogyo K.K.* – Osaka refinery 20,000kg
Ore & Source	**Purity**	**Quantity**	**Location of Stocks**
Mixture of titanium and monazite (Malayan) **Monazite** **Titanium**	 30% 10%	 12,000kg	 *Mitsubishi Kogyo K. K.* – Osaka refinery 12,000kg
***Amang* (Malayan)**		1,750,000kg	*Riken Noson Kogyo K. K.* – Arakawa plant – 1,000,000kg Ishikawa plant 45,000kg *Nippon Kigenso Tosei Kumiai* - Inasa plant 400,000kg *Mitsubishi Kogyo K. K.* Osaka refinery – 300,000kg Omiya lab – 5,000kg

Source: (Reproduced from the Translation of report submitted by *Nippon Kigenso Tosei Kumiai*, 1 April 1947)

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As can be seen from Table 1, most of the monazite and *amang* were held by the *Riken Noson Kogyo K. K.* which was formerly the *Riken Kigenso Kogyo K. K.* before WWII ended. This is not surprising at all since the physicist Nishina who was based at RIKEN was trying to acquire uranium for Japan's nuclear research and needed lots of *amang* and monazite which he could extract the uranium.

Below is Table 2 showing Japan's rare elements import from Malaya from the period 10 October, 1943 – 15 August, 1945.

Table 2: Importation of Rare Elements from Malaya by the Japan Rare Element Control Association *(Nippon Kigenso Tosei Kumiai)* from 10 October, 1943 – 15 August, 1945

Ore	Amount
Black sand (*amang*)	2,530 tons
***Amang* crude**	600 tons
Monazite crude ore	200 tons

Source: (Nakaya, 1946).

With regard to uranium extraction activities at RIKEN, apparently the Arakawa and Adachi plants treated about 1 -2 tons of monazite per month (Translation of report, submitted by Mr. Nakaya of the *Nippon Kigenso Tosei Kumiai*, 1946). The monazite was treated with the aim to produce cerium fluoride, a by-product of thorium hydroxide. Indeed, the Arakawa plant of RIKEN treated both Brazillian and Korean monazite but used none from Malaya. This was because Malayan monazite contained very minimal amounts of uranium and was not really worth the effort of extraction.

After WWII ended, all of the thorium and uranium-bearing ores were ordered by the US government to be confiscated from Japan through orders given in a directive (WX-88780) on 15 December, 1945 and forwarded to the Supreme Commander for the Allied Powers (SCAP) ("Memo for Record", 1948). In the end, a considerable amount of *amang* and monazite acquired by Japan from its various colonies and conquered territories were being shipped to the US at the end of WWII. The ship, *SS Resolute* on 3 September 1948 had carried 44,431 pounds of chemicals Not Otherwise Identified by Name (NOIBN) and 2,369,023 pounds of confiscated radioactive sand bound for the New York Port of entry and would be stored at the United States Government Warehouse, Middlesex in New Jersey ("Army Ocean Manifest", 1948). The shipped rare elements to the US were classified as the following namely monazite would be known as "Sand Group 22", with *amang* known as "Sand Group 25" while other chemicals would be classified as "Chemicals NOIBN" ("Subject Uranium and Thorium", 1948). These minerals shipped to the US would contain uranium in a dry state to cover yellowcake, uranium and thorium metals. However, there was still some monazite remaining at Honshu in Japan that was never shipped to the US as there was too little content of uranium not considered useful for the US nuclear Manhattan project. Thus, this section elaborated on the fate of the monazite and *amang* acquired by Japan for its nuclear project not only from Malaya but from other conquered territories that ended up as war booty for the US.

Penang Island as a Transit Point for Uranium en Route to Japan

In furthering its aim of atomic research, Japan was desperate enough to request from Germany the export of uranium oxide. This was evident when on 7 July 1943 General Touransoke

International Journal of Law, Government and Communication
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Kawashima requested from his German counterpart to procure uranium oxide from Czechoslovakia. Germany had relented to the Japanese request to send uranium oxide to Japan as yellow cakes (Wilcox, 2019). Prior to this, Japan itself had sent its own I-class submarine, I-8 to France and uranium was mixed into an amalgam together with mercury to be packed in cylinders that were stored in keel boxes.

There is a good reason to suspect that the German submarine U859 which left Germany in 1944 from the port of Kiel may have been transporting uranium oxide but was sunk on 9 February 1945 by the British submarine, Trenchant, 25 miles north of the island of Penang (Bryen, 2017; *Simon v Taylor and Others*, 1975). The U859 was reported to be carrying 70 tons of mercury worth US$750,000 when it sunk in 1945 ("Sunken U-boat", 1972, p.2). Merely two seamen and an engineering officer, Horst Klatt had survived the sunken submarine while another 36 officers on board had perished ("Sunken U-boat", 1972, p. 19). Supposedly, the mercury was meant for Japan's chemical industry ("Mercury, not gold", 1972, p. 18). Sunk with the U859 submarine were some top secret Nazi documents located in a safe (Richardson, 1972, p. 6). When a salvage team dived into the U859 submarine in 1972, they managed to recover about 12 tons of mercury, but nothing was mentioned about uranium oxide (Child-Dennis, 2018, p. 34). This could have been the case whereby the mercury was carried in zinc cannisters and mixed together with uranium oxide to form a paste resistant to hydrostatic crushing and located in the flooded keel and ballast tanks of the submarine. Once the submarine arrives at its destination, the mercury can be separated from the uranium oxide. Thus, Germany could have kept a secret that the mercury recovered was actually a mixture with uranium oxide by just indicating the recovery of mercury.

The 12 tons of mercury that was salvaged from the U859 become a contentious issue with regard to ownership. About $3^{1/2}$ tons of mercury was brought to Singapore at the end of January 1972 while $8^{1/2}$ tons was brought to Penang on 3 March 1972 and left with the Receiver of Wreck, Malaysia (*Simon v Taylor and Others*, 1975, p. 3). The dispute among the related parties claiming the mercury ended up with a court case in Singapore. Indeed, the claimants to the mercury were the German Embassy on behalf of its government who later transferred the ownership of U859 and its cargo to Hans L, Simon, who once worked as a staff for the Nazi spy chief Admiral Canaris during WWII (Taylor, 1972a, p. 7), and some British and Australian citizens who initially carried out the salvaging activities and were known as GJ Taylor, HR Leishman J, CW Bastian and AS Dickie (*Simon v Taylor and Others*, 1975, p. 1; Taylor, 1972b). The other third party to claim the mercury form U859 was Contract Services Ltd and Evermore Marine Technical Services (Pte) Ltd (*Simon v Taylor and Others*, 1975, p. 1). The judgement from this Singapore High Court case had awarded the mercury in the end to Hans L. Simon on behalf of the Federal Republic of Germany despite the British and Australian citizens asserting they had a claim with the submarine being in international waters and anyone had a right to it (*Simon v Taylor and Others*, 1975, pp. 8 - 9). The court in Singapore also determined that the British and Australian nationals were not voluntarily salvaging the submarine and its contents from being in danger of spilling and causing environmental harm but were self-motivated to obtain the mercury for their own enrichment (*Simon v Taylor and Others*, 1975, p. 8). Thus, the mercury went back to the Government of Germany but it is speculated that the mercury could have been mixed with uranium oxide for Japan's nuclear research.

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As for another ill-fated German submarine known as U-234, a Kriegsmarine belonging to class type X, the USS Sutton intercepted it on 15 May 1945 in the waters of Newfoundland and Labrador and were brought to Portsmouth, New Hampshire (Graf, 2015). Found in this submarine was 560kg of uranium oxide in 50 cubic lead of 230mm side (Graf, 2015, p. 126). Had this submarine not been intercepted by the USS Sutton, its Admiral Karl Doenitz would have followed the path to the Atlantic Ocean via the North Sea and subsequently to reach the Cape of Good Hope. Subsequently, the submarine would have proceeded to the Indian Ocean and thereupon to Penang, Malaya to unload its very important content to the Japanese (Graf, 2015, p. 126). Hence, Penang Island unknown to many Malaysians was a transit point for the Germans to transfer uranium oxide, crucial for Japan's atomic research which would then receive it in Japan during WWII.

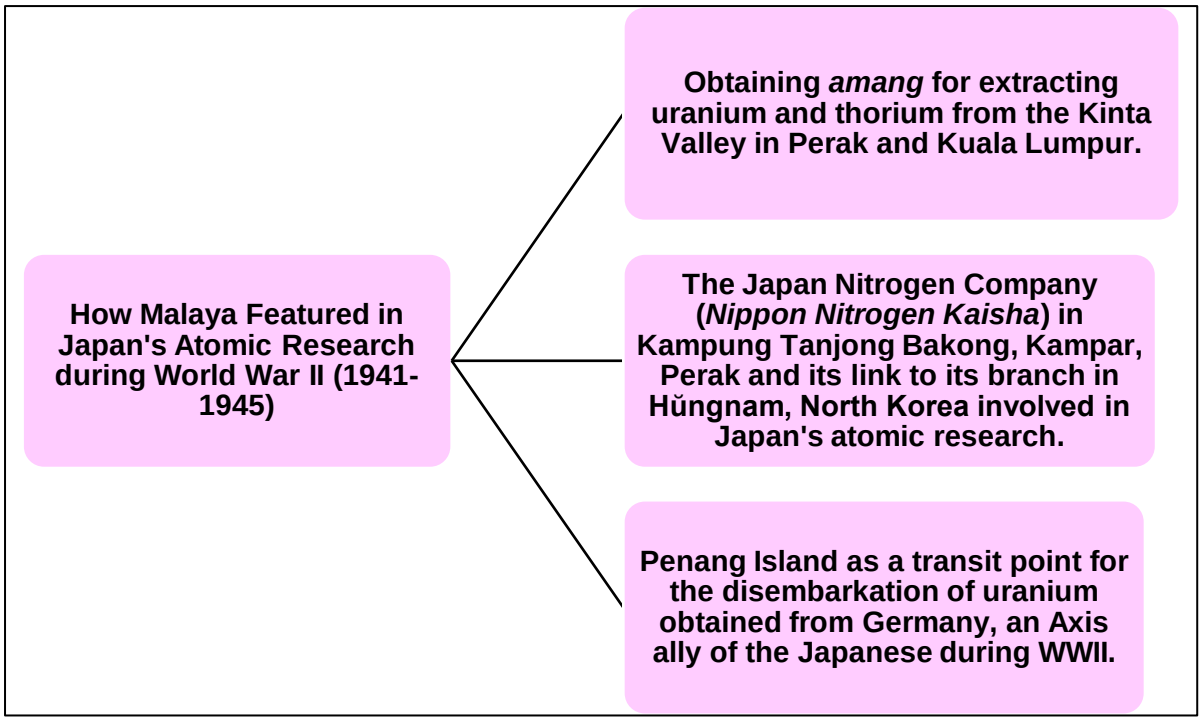

Figure 3: Summary of the Extent Malaya Featured in Japan's Atomic Research during WWII.

Figure 3 summarises three instances regarding how Malaya featured in Japan's atomic research during WWII based on the discussion made earlier.

Japan's Acquisition of Rare Earth Elements and the State of Export Control Law During World War II

As previously discussed, Japan during WWII was actively acquiring *amang* that contain rare earth minerals such as monazite which contains thorium as input for its atomic research from Malaya. Japan also utilised Penang Island as a transit point for the disembarkation of uranium from German submarines to subsequently be transmitted to Japan. This raises a salient point of whether Japan's acquisition of rare earth minerals for the purpose of its atomic research would have been governed by export control law applicable worldwide. If there existed export controls applicable to all states, Japan's action of obtaining rare earth minerals for the nefarious purpose of creating an atomic bomb would have been an offense. This section seeks to explore the state of export control law during the period of WWII (1941 – 1945) to discover whether

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there was some form of governance that would monitor and prohibit states from acquiring rare earth minerals with the malicious intent of creating an atomic bomb.

In February 1941, President Roosevelt of the US imposed an export licensing system for the exportation of radium and uranium and it had to be revealed the final destination of export for these minerals ("License needed", 1941, p. 1). The US had imposed export controls for these minerals for fear that the Japanese would misuse these minerals for armaments given Japan's expansionist policy in the Asia Pacific. Merely friendly nations to the US such as Great Britain and those in the Western Hemisphere were issued licenses. Thus, the US was quite apprehensive and suspicious of Japan's intention to acquire uranium as it could be channelled for nefarious means.

As the Manhattan Project began on 13 August, 1942 with the aim of creating atomic bombs as soon as possible against US rivals, the US found itself in want of acquiring more uranium (Jones, 1985). In achieving this objective, the US and the UK signed an Agreement between the US and the UK for the Establishment of the Combined Development Trust (CDT) on 13 June, 1944 [thereafter Declaration of Trust] (Jones, 1985, p. 90). The CDT would be under the directive of a Combined Policy Committee (CPC) and would be based in the City of Washington, District of Columbia, US. The CDT was a joint organisation formed for "gaining control of the Two Governments (the US and UK) and of the Governments of the Dominions and of India and of Burma" ("Agreement between the United States and the United Kingdom for the Establishment of the Combined Development Trust", 1944). The term "certain areas" was used in this agreement between the US and UK so as not to incur Russia's ire when the agreement became public (Jones, 1985, p. 299). The CDT would be administered by six individuals whereby one was selected from Canada. Notably, this Declaration of Trust to restrict the acquisition of uranium and thorium was a supplement to the Quebec Agreement signed by UK Prime Minister, Winston Churchill and President Theodore Roosevelt of the US on 19 August, 1943 with Canada opting out not to become a signatory (Jones, 1985, p. 296). Thus, on 19 September 1944, the CPC instructed the CDT to undertake a survey of potential sources of radioactive material worldwide to help the US atomic research (Jones, 1985, p. 3030). However, when uranium was obtained, it was unevenly distributed between the US and the UK as priority was given to the US to acquire as much uranium as possible to build atomic weapons and end WWII quickly.

Securing large amounts of uranium from the Congo increasingly became a priority for the US and the UK. Negotiations were conducted with the Belgian government in exile in the UK on 27 March, 1944 (Hewlett & Anderson Jnr., 1962, p. 287). The Belgian government was receptive to the proposal to secure the uranium but dare not make a firm commitment given the absence of Edgar Sengier, the main official of Union Minière who controlled the Shinkolobwe Mine in the Congo for uranium as he was away in New York. On September 26, 1944, an agreement was reached among the three parties in a form of Agreements between the United States and the United Kingdom and between the United States, the United Kingdom, and Belgium regarding the Acquisition and Control of Uranium [thereafter Tripartite Agreement, 1944]. One of the most important phrases in this Tripartite Agreement stressed that:

> *"[D]uring the present war against Germany and Japan and in the future all uranium and thorium ores wherever located should be subject to effective control for the*

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> *protection of civilization, and to this end the Government of Belgium will insure effective control of said ores located in all territory […]"* (Tripartite Agreement, 1944)

The phrase "protection of civilization" in this Tripartite Agreement can be interpreted as a realisation by the signatories to the agreement about the potential misuse of uranium for nefarious purposes, i.e., in creating an atomic bomb which is ever so powerful for the destructiveness of humankind and its civilization to render the need to guard the uranium against getting into the hands of wrongdoers.

The CDT on behalf of the US and the UK entered a contract with African Metals Corporation that acted on behalf of the producing company, Union Minière du Haut Katanga. The Belgian government on its part would supply 1,720 tons of uranium oxide to the UK and the US meant for military and strategic purposes. Nevertheless, this Tripartite Agreement was to be kept as a military secret among its signatories and not to be divulged among non-parties.

The US on its part secretly brokered an agreement with Brazil known as the Memorandum of Agreement between the United States of Brazil and the United States of America on 10 July, 1945. Brazil had basically agreed upon:

> *"[The] restrictions on the export from Brazil of all grades of monazite sands or other carriers or compounds of thorium or of thorium, limiting the export of such materials to consignees in the United States or to other consignees designated or approved by the Government of the United States."* (Memorandum of Agreement between the United States of Brazil, 1945)

Just like the Japanese who exported *amang* that contained monazite back to its home country from Malaya during WWII, the US was similarly obtaining monazite from Brazil albeit with additional conditions not to export this mineral to other countries through a secret agreement between both parties. In fact, the US utilised Union Mines to identify thorium in Malaya in 1945 (Jones, 1985, p. 295). This thorium was meant for the US atomic research through the Manhattan Project.

Besides Brazil and Belgium, the CDT had arranged contracts to secure uranium and thorium from other countries such as Portugal, the Netherlands (for thorium in the East Indies), India (thorium), South Africa and Australia (Anstey, 2014, p. 3). Thus, the CDT countries had managed to control 97% of worldwide uranium and 65% of thorium ore by late 1945 as reported by General Leslie Groves in the US (Atomic Heritage Foundation & National Museum of Nuclear Science and History, 2014, p. 2).

The US can also be said instrumental in introducing export control laws as it already had the Export Control Act of 1940 which restricted the shipment of certain materials to pre-war Japan ("License needed for export", 1941; US Department of Commerce, 1941). This law would introduce a licensing system for uranium in February, 1941 whereby any country wanting to acquire uranium from the US would have been subjected to a license which included Japan. It was only after WWII had ended and by 1948 that a Coordinating Committee for Multilateral Export Controls (CoCom) had been formed to also control the acquisition of rare earth minerals that would truly be the first multilateral export control regime (Institute of Medicine National Academy of Sciences et al., 1991).

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As for the UK, the applicable law that would have prohibited Japan from acquiring uranium through exports and from British colonies not overtaken by an occupying power in WWII would be the Import, Export and Customs Power (Defence) Act of 1939. Section 8 (1) (d) of the Import, Export and Customs Power (Defence) Act of 1939 would have referred to Malaya as "enemy territory" being occupied by Japan during WWII since it is "any area which is under the sovereignty of, or in the occupation of, a Power with whom His Majesty is at war". However since Japan overthrew the UK and occupied Malaya as its territory, it was free to syphone *amang* containing monazite that could contain traces of thorium and uranium for its own use. Section 3 (1) (a) of the Import, Export and Customs Power (Defence) Act of 1939 also indicates "[i]f any goods are imported, exported, carried coastwise or shipped as ship's stores in contravention either of an order under this Act or of the law relating to trading with the enemy, [then] those goods shall be deemed to be prohibited goods and shall be forfeited; and the exporter of the goods […], shall be liable". If the UK had caught anyone from its territory or colony supplying uranium to Japan provided it had made this mineral a prohibited mineral to be exported to Japan, the wrongdoer could be charged under this law.

Unfortunately, the UK itself lost control of Malaya as its colony and ceded its territory to Japan in 1941. As Japan controlled Malaya, it naturally confiscated all *amang* containing monazite and in turn thorium as war bounty being brought back to its home country for its own atomic project. It would have been a case of both the US and Japan willing to exploit the British colony, Malaya as both parties were eyeing thorium for their atomic research. Hence during WWII, Malaya witnessed the exploitation of its mineral resources meant for atomic research without much say from the locals as independence was not on its horizon yet until 1957.

While bilateral and trilateral agreements were initiated to control the acquisition of uranium and thorium during WWII, there is a need to examine if any multilateral efforts were being initiated to prevent Japan and Germany from acquiring the necessary. As the creation of the atomic bomb became a reality in the US through the Manhattan Project, many scientists, individuals in the US army and closest advisors to the US President began to realise the dangers that atomic energy could unleash if left unchecked to require international controls. This realisation came even before the bombings of Hiroshima and Nagasaki in Japan on the 6th and 9th of August, 1945 (Dower, 1995). Leo Szilard, one of the concerned scientists in January 1944 had written to Dr. Vannevar Bush in the CPC calling for international control with regard to atomic research (Hewlett & Anderson Jnr., 1962, p. 342). Subsequently, in March 1945 Szilard prepared a memorandum detailing the vulnerabilities from an atomic attack that would require the US to seek international controls (Hewlett & Anderson Jnr., 1962, p. 326). Committees were formed and engaged scientists to study the implications of atomic research. One such committee was led by Zay Jeffries who produced a report called the Prospectus of Nucleonics [thereafter Jeffries Report] on 18 November, 1944 (Smith, 1958, p. 291). One of the most outstanding recommendations made from the Jeffries Report was:

> *"The necessity for all nations to make every effort to cooperate now in setting up an international administration with police powers which can effectively control at least the means of nuclear warfare"* (Jeffries Report, 1944, p. 57).

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With regard to controlling rare earth minerals, the Jeffries Report had asserted:

> *"Among the ways by which the worldwide development of nucleonics can be kept under control, one of the most important is the supervision of critical materials [metals and minerals], particularly those which are of crucial value for military purposes. Even within a nation this is of particular importance, since any group gaining control over such materials might seize and hold power in that nation"* (Jeffries Report, 1944, p. 57).

The implied message from the above quote seems to suggest that any attempt by a country to acquire rare earth minerals albeit in large quantities must be regarded with suspicion as this could be an effort to develop nuclear weapons. Furthermore, a country that has managed to monopolize rare earth minerals in another's territory would stand to gain supremacy and an edge in developing atomic or nuclear weapons.

The Jeffries Report also made a recommendation to oversee worldwide prospecting for ores such as uranium, thorium and beryllium which would be very useful for nucleonics (Jeffries Report, 1944, p. 57). Moreover, the said report went further to reinstate that careful studies were required of these said ores, monitoring the stockpiling of these ores and also the heavy water associated with atomic research (Jeffries Report, 1944, p. 57).

The formation of the Interim Committee (IC) in May, 1945 by the US Secretary of War had the role of advising post-war control of atomic energy domestically in the US and abroad (Jones, 1985, p. 90). The IC was also tasked with overseeing international controls. The previous memorandum on international control dated 30 September, 1944 and the Jeffries Report were passed among committee members for further deliberations. A sub-committee under the IC known as the Franck Committee was also formed to give inputs to the IC. In one of its deliberations on 4th June, 1945 which would form the memorandum called "Conditions under which International Control is Most Probable", issues being discussed included why the need for international controls, its implementation process through the monitoring of raw materials or rare earth minerals, the need for inspection, pooling of fissionable material or through a combination of a few methods (Smith, 1958, p. 301). In the end, it was agreed among the different sub-committees that international control was necessary. This decision made its way into the Report to the Secretary of War in June, 1945 whereby it had been stated:

> *"Unless an effective international control of nuclear explosives is instituted, a race for nuclear armaments is certain to ensure following the first revelation of our [US] possession of nuclear weapons to the world"* (Smith, 1958, p. 302).

Moreover, it was highlighted in the Report to the Secretary of War should the US be the first to use an atomic bomb causing indiscriminate destruction that this would prejudice its position in reaching an agreement among other countries for international control of nuclear weapons (Smith, 1958, p. 302). Based on the analysis conducted, it would seem that the domestic laws of the US and UK concerning export controls would most likely apply to prohibit the Axis powers of Japan and Germany, as well as Russia from obtaining uranium and other minerals for building armaments. A multilateral initiative of export controls being implemented through an international organisation during WWII just did not exists at that time to regulate the necessary.

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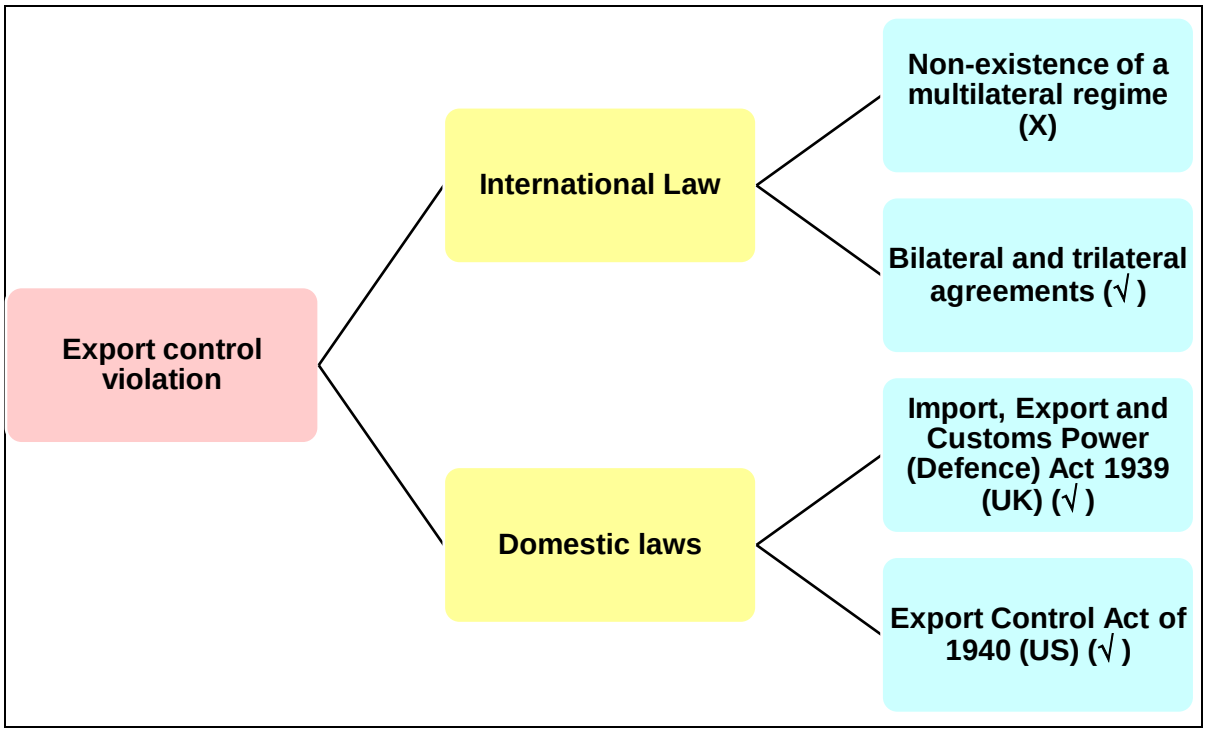

Figure 4: A Summary of the Japanese Acquisition of Rare Earth Minerals (Thorium and Uranium) in Violation of Export Controls Internationally and Domestically

Figure 4 summarises the deliberation whether export controls existed internationally during WWII albeit to a limited extent through bilateral and trilateral agreements but not multilaterally. Figure 4 also shows the US and UK as two of the earliest countries to introduce their export control laws even before WWII started.

Conclusion

This study set out to investigate the extent of the Japanese search for uranium and thorium in Malaya for its atomic research during WWII and utilising this colony as a point of transit for the importation of these minerals which could have been legal or illegal depending on the imposition of export control laws during that period of time. This study found that the Japan Nitrogen Company which was based in Kampung Tanjung Bakong, Malim Nawar, Perak was involved in manufacturing explosives meant for WWII and it had future plans of producing ammonia for industrialisation. No record exists to show the Japan Nitrogen Company in Malim Nawar had in any way been given the task to explore minerals for Japan's atomic research.

The Japanese though syphoned large quantities of *amang* mainly from the Kinta Valley in Perak and in Kuala Lumpur to be exported to Japan. Monazite was obtained from the *amang* and in turn, uranium and thorium were extracted for Japanese atomic research. The imported *amang* into Japan was managed by the Nippon Rare Element Control Association which distributed it among the industry players and the *RIKEN* which conducted atomic research. When the war ended in 1945, some *amang* was redistributed among the Japanese industry while the bulk of it was shipped to the US on a ship and stored at warehouses.

Penang Island in Malaya became a point of transit for the German navy to transfer their load of uranium from their submarines to the Japanese who supposedly brought back this mineral under the guise of industry usage but was actually meant for atomic research.

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It can also be summed that bilateral and trilateral agreements formed secretly among the Allied powers of the US and UK during the period of WWII to some extent prohibited Japan, Russia and Germany from acquiring uranium and thorium for the purpose of their atomic research. Since these bilateral and trilateral agreements merely targeted a few specific countries which were rich in uranium and thorium but excluded others, only countries that were signatories were bound to honour these agreements and forbidden to supply the said minerals to Japan, Russia and Germany. Other countries who are non-parties of their own free will may at any time supply uranium and thorium to Germany, Russia and Japan. Hence, to a very limited extent export control law had existed during the WWII period to prohibit the exportation of uranium and thorium to recalcitrant countries whom the Allies suspected were doing atomic research to produce an atomic bomb that could devastate humankind. As Ozga (2001, p. 13) had mentioned, the actions of the US and UK in "managing nuclear threats yielded the first institutionalised international control system, based on secrecy and denial". Indeed, this was the first export control system being introduced to make any country's request for rare earth minerals in large quantities to be under suspicion and to be denied as it could be misused for a malicious aim. However, these export controls of barring uranium and thorium from being exported to Japan, Russia and Germany did not apply in any way at the multilateral level with many member countries in an international organisation that could enforce and make it mandatory for its members to comply with this requirement. This means that the need to deny the acquisition of rare earth minerals for the negative purpose of creating an atomic bomb had not been widely accepted by a bigger group of countries to become a norm in export control law during WWII. Merely few countries started to accept this emerging trend and therefore during WWII, the said practice could not have developed into a norm.

Nevertheless, there was a spark of awareness for the need to form an international organisation with policing powers that would monitor a country's atomic research which included controlling its acquisition of rare earth metals and minerals in the form of international controls. This though was future plans to be implemented after WWII ended in 1945 and not throughout the duration of the war from 1941 – 1945. Such a multilateral effort of this scale would be extended to other countries who would wish to become parties in controlling rare earth minerals and metals that could be exploited for nefarious purposes. This implies that an emerging norm was slowly growing among countries to accept that certain rare earth minerals must be curtailed from getting into the hands of rogue states with the intention of creating nuclear weapons as they are morally bound to prohibit such nefarious actions. It is through this foundation already laid during WWII that formed the basis later for the setting of the CoCom albeit with more countries joining this multilateral export control regime.

The implication of this is that had multilateral efforts for international control been in place during the WWII period, Japan would face a boycott in getting supplies of uranium and thorium from other countries besides those that had already signed bilateral and trilateral agreements with the Allied powers. However, the Allied powers bound their bilateral and trilateral partners to whom they obtained uranium and thorium to secrecy as they did not want their secret of creating atomic bombs to be divulged in the open. Additionally, the Allied powers did not want the Axis powers (Germany and Japan) to know they already had the capability and technology in creating atomic bombs so that the Allies would have an edge in WWII. Therefore, the implementation of export control law in the form of bilateral and trilateral agreements among a few selected countries to bar uranium and thorium from Japan, Russia, and Germany did exist

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during WWII but had yet to be enforced on a multilateral scale involving an international enforcement organisation.

References

Abiorensen, N. (1995, July 29). Japan's scramble for the bomb. *Canberra Times*, 18.

"Agreement between the United States and the United Kingdom for the Establishment of the Combined Development Trust." June 13th, 1944, in Foreign Relations of the United States. 1944, Vol. II : General: Economic and Social Matters, p. 1027. Washington: United States Government Printing Office, 1967. https://history.state.gov/historicaldocuments/frus1944v02/d885

"Agreements between the United States and the United Kingdom and between the United States, the United Kingdom, and Belgium regarding the Acquisition and Control of Uranium." September 26th, 1944, in Foreign Relations of the United States. 1944, Vol. II : General: Economic and Social Matters, p. 1026. Washington: United States Government Printing Office, 1967. https://history.state.gov/historicaldocuments/frus1944v02/comp19

Anstey, I. (2014). A gentlemen's agreement. In S. Weiner (Ed.), *Nuclear scholars initiative: A collection of papers from the 2013 nuclear scholars initiative* (pp. 1–282). Rowman & Littlefield. https://csis-website-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publication/140109_Weiner_NuclearScholarsInitiative2013_WEB.pdf

Army Ocean Manifest. Vessel: Resolute. From: Yokohama. To: New York POE. Loaded at: South Pier. Date: 2 Sept 1948/ Class: Chemical. (1948, September 2). (RG 331, Stack Area 290, Row 24, Compartment 2, Shelf 1, Entry 224, Box 3, page 1). The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD.

Atomic Heritage Foundation, & National Museum of Nuclear Science and History, U. S. (2014, June 4). *Combined Development Trust*. Atomic Heritage Foundation. https://www.atomicheritage.org/history/combined-development-trust

Baudzus, A. (2006). *The Nazi: Coming of age in Hitler's Germany and the voyage of the U-859*. Riverdale Electronic Books.

Binnie, A.-E. (2003). *From atomic energy to nuclear science: A history of the Australian Atomic Energy Commission* [Doctor of Philosophy (PhD), Macquarie University]. https://www.researchonline.mq.edu.au/vital/access/manager/Repository/mq:6293

Bradley, M. (2012). *Buffalo & breadfruit: Tales of an unwary expat in Malaysia*. Monsoon Books Pte. Ltd.

Bricknell, D. (2011). Historical analysis. In R. Thorpe and R. Holt (Eds.), *The SAGE dictionary of qualitative management research* (pp. 108–109). Chicago: Sage. Retrieved from https://dx.doi.org/10.4135/9780857020109.n50

Bryen, S. D. (2017). *Technology security and national power: Winners and losers* (1st ed.). Routledge.

Child-Dennis, D. (2018, December). U-boat 196: The mystery continues. *Elocal Magazine*, *213*, 34–35.

Dower, J. W. (1978). Science, society, and the Japanese atomic-bomb project during world war two. *Bulletin of Concerned Asian Scholars*, *10*(2), 41–54. https://doi.org/10.1080/14672715.1978.10409086

Dower, J. W. (1995). The bombed: Hiroshimas and Nagasakis in Japanese memory. *Diplomatic History*, *19*(2), 275–295.

Graf, K. (2015). *History of the U-Boot*. Edizioni R.E.I.

International Journal of Law, Government and Communication
EISSN : 0128-1763
IJLGC
Volume 7 Issue 30 (December 2022) PP. 87-109
DOI 10.35631/IJLGC.730009
Grunden, W. E. (2015). Hungnam revisited: The "secret" nuclear history of a North Korean city. *Intelligence and National Security*, *31*(5), 1–13. http://dx.doi.org/10.1080/02684527.2015.1088690

Hewlett, R. G., & Anderson Jr., O. E. (1962). *The new world, 1939/1946* (Vol. 1). The Pennsylvania State University Press.

Hosaka, M. (2012). *Nihon no genbaku ― sono kaihatsu to zasetsu no dōtei* [Japan's atomic bomb - Its development and frustrating path]. Tokyo: Shinchōsha.

Ii, T. (2016, March). *Searching for the objective analysis: Japanese atomic bomb research and the victimhood narrative* [Meeting presentation]. Phi Alpha Theta 32nd Annual Hawai'i Regional Meeting, Hawai'i Pacific University. https://manoa-hawaii.academia.edu/TokiII

Institute of Medicine National Academy of Sciences, National Academy of Engineering, Public Policy Committee on Science, Engineering, & Panel on the Future Design and Implementation of U.S. National Security Export Controls. (1991). *Finding common ground: U.S. export controls in a changed global environment*. National Academies Press.

Jeffries, Z., Fermi, E., Franck, J., Hogness, T. R., Mulliken, R. S., Stone, R. S., & Thomas, C. A. (1944). *Prospectus on nucleonics.* https://atomicinsights.com/wp-content/uploads/Prospectus-on-Nucleonics.pdf

Jones, V. C. (1985). *Manhattan: The army and the atomic bomb (United States army in World War II: Special studies)*. United States Army Center of Military History. https://history.army.mil/html/books/011/11-10/CMH_Pub_11-10.pdf

Kaji, M. (1999). Japan's atomic project during World War II. In E.P. Velikhov, L.D. Ryabev, N.A. Chernopley (Eds.), *International Symposium- Science and Society: History of the Soviet Atomic Project (40's-50's), Dubna, Proceedings T.2*, (pp. 518–522). M. Publishing House. http://elib.biblioatom.ru/text/istoriya-sovetskogo-atomnogo-proekta_t2_1999/go,2/

Kratoska, P. (1998). *The Japanese occupation of Malaya and Singapore, 1941-45: A social and economic history* (1st ed.). National University of Singapore Press.

Kurahashi, Y. (2003). Creating a tapestry of voice and silence in Michiko Ishimure's Kugai Jodo (Paradise in the sea of sorrow). *Journal of Narrative Theory*, *33*(3), 315–334. https://doi.org/10.1353/jnt.2010.0002

Kyra, S. I. (2013, March 10). The Japanese occupied my village. *New Sunday Times*, 31.

Licence needed for export of radium. (1941, February 5). *Malaya Tribune*, 1.

Loke, E. (2011, May 30). Woman forced to help the Japanese build a fortress when just a child. *The Star*, 1–2.

McRae, K. D. (2014). *Nuclear dawn: F. E. Simon and the race for atomic weapons in world war II*. Oxford University Press.

Memo for Record. Subject: Impoundment of Radioactive Stockpiles in Japan – Summary of Events. (1948, July 23). (RG331, Stack Area 290, Row 24, Compartment 2, Shelf 1, Entry 224, Box 3). The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD.

"Memorandum of Agreement between the United States of Brazil and the United States of America." July 6th, 1945, in Foreign Relations of the United States. 1945, Vol. II : General: Political and Economic Matters, p. 20. Washington: United States Government Printing Office, 1967. https://history.state.gov/historicaldocuments/frus1945v02/d6

Mercury, not gold was on U-859 in '44. (1972, December 15). *Pacific Daily News*, 18.

International Journal of Law, Government and Communication
EISSN : 0128-1763
IJLGC
Volume 7 Issue 30 (December 2022) PP. 87-109
DOI 10.35631/IJLGC.730009

Miyamoto, Y. (2021). *A world otherwise: Environmental praxis in Minamata*. Lexington Books.

Nakaya, R. (1946). *Interview with Mr. Ryukichi Nakaya of the Nippon Kigenso Tosei Kumiai Seisan Jimusho (Liquidation Office of the Nippon Rare Element Control Association)/ Interviewer: George Yamashiro.* GHQ/SCAP Records (RG331, Box STD-6, Folder 20, File #180). The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD.

Nasution-Khoo, S., & Lubis, A.-R. (2005). *Kinta Valley: Pioneering Malaysia's modern development*. Perak Academy.

Nish, I. (2011). *The Japanese in war and peace, 1942-48: Selected documents from a translator's in-tray*. Global Oriental.

Overstreet, W. C. (1967). *The geologic occurence of monazite*. United States Government Printing Office. https://pubs.usgs.gov/pp/0530/report.pdf

Ozga, D. A. (2001). *The principles of nuclear control* [Doctor of Philosophy (PhD), School of Social Sciences, University of Southampton]. https://eprints.soton.ac.uk/464432/1/791264_v.1.pdf

Richardson, M. (1972, December 12). Australians in gold hunt. *The Age*, 6.

Roitto, M., Nevalainen, P., & Kaarkoski, M. (2020, November 24). Fuel for commercial politics: The nucleus of early commercial proliferation of atomic energy in three acts. *Business History*, 1–45. https://doi.org/10.1080/0007679.2020.1845316

Rundschau Der Chemiewirtschaft: Japan [Review of the chemical industry: Japan]. (30 October 1942). *Die Chemische Industrie*, *No. 43/44*, 449–468. http://delibra.bg.polsl.pl/Content/2191/Die%20chemische%20industrie%201942.%20nr43.44.pdf

Simon v Taylor and Others, 2 Lloyd's Rep. 338 (Singapore High Court). https://justis.vlex.com/#vid/simon-v-taylor-842798792

Smith, A. K. (1958, October). Behind the decision to use the atomic bomb: Chicago 1944-45. *Bulletin of the Atomic Scientists*, *14*(8), 288–312.

Stanley, M. (1945, October 22). Japan had only 21 men working on atom. *News*, 2.

Streifer, B. (2018). The atomic bombing of Hiroshima and Nagasaki through the eyes of Prof. Bunsaku Arakatsu. *Boctok (Oriens)*, *1*, 47–56.

Subject: Uranium and Thorium. (17 August 48). (1948, August 17) (AG 410. 42, ESS/SFU, RG 331, Stack Area 290, Row 24, Compartment 2, Shelf 1, Entry 224, Box 3). The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD.

Sunken u-boat salvager's prize. (1972, December 12). *The Minneapolis STAR*, 2.

Taylor, B. (1972a, September 3). "Hands off our U-boat!" *The Sunday People*, 7.

Taylor, B. (1972b, November 26). Britons lose the fight for Nazi treasure. *The Sunday People*, 9.

The Export Control Act of 1940 ch. 508, § 6, 54 Stat. 714 (1940).

The Import, Export and Customs Power (Defense) Act (1939) (United Kingdom).

Translation of report submitted by Mr. Nakaya of the Nippon Kigenso Tosei Kumiai. (1946, June). GHQ/SCAP Records (RG331, Box STD-6, Folder 12, File #172). The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD.

Translation of report submitted by Nippon Kigenso Tosei Kumiai. (1947, April 1). GHQ/SCAP Records (RG331, Box STD-6, Folder 20, File #180). The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD.

US Department of Commerce. (1941). *Foreign commerce weekly* (Volume 2, No. 1). US Department of Commerce.

International Journal of Law, Government and Communication
EISSN : 0128-1763
Volume 7 Issue 30 (December 2022) PP. 87-109
DOI 10.35631/IJLGC.730009

https://books.google.com.my/books/about/Foreign_Commerce_Weekly.html?id=d6ZVc9PXdF8C&redir_esc=y

Wiersma, W. (1982). *Research methods in education: An introduction* (5th edition). Allyn & Bacon.

Wilcox, R. K. (2019). *Japan's secret war: How Japan's race to build its own atomic bomb provided the groundwork for North Korea's nuclear program* (3rd ed.). Permuted Press.

Yang, D. (2006). Japanese colonial infrastructure in Northeast Asia: Realities, fantasies, legacies. In C.K. Armstrong, G. Rozman, S.S. Kim and S. Kotkin (Eds.), *Korea at the center: Dynamics of regionalism in Northeast Asia* (pp. 92–109). M.E. Sharpe. https://scholar.princeton.edu/sites/default/files/korea_at_the_center_0.pdf