Railway of Infinite Regret
Uranium on the Thai-Burma Railway
1943-1945

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MAIN SOURCES

The information presented below is used to support the statements offered above.

The author of this paper assumes the reader is somewhat familiar with the Japanese atomic energy and research programs of the period 1938-1945. Some recommended sources:

- Grunden, Walter E. Hungnam and the Japanese atomic bomb: Recent historiography of a postwar Myth. Intelligence and National Security. Volume 13, Issue 2, 1998
- Grunden, Walter E. Secret Weapons & World War II, Japan in the Shadow of Big Science. University Press of Kansas. Wichita State University. 2005
- Grunden, Walter E., Mark Walker and Masakatsu Yamazaki. Wartime Nuclear Weapons Research in Germany and Japan. *Osiris.* 2nd Series, Vol. 20, Politics and Science in Wartime: Comparative International Perspectives on the Kaiser Wilhelm Institute. 2005
- Grunden, Walter E. From Hungnam to Yongbyon: Myths and Facts Concerning the Origins of North Korea's Nuclear Program. Associate Professor Department of History Bowling Green State University Bowling Green, OH. August 7, 2013
- Rhodes, Richard. Dark Sun: The Making of the Hydrogen Bomb. Simon & Schuster. New York. 1995
- Shapley, Deborah. The Japanese A-bomb. Nuclear Weapons History: Japan's Wartime Bomb Projects Revealed. 13 Jan 1978
- Snell, David. Japan Developed Atom Bomb; Russia Grabbed Scientists. Constitution. Atlanta, Georgia. 3 Oct 1946
- Wilcox, Robert K. Japan's Secret War: Japan's Race against Time to build its Own Atomic Bomb. Marlowe & Company, New York. Copyright 1995
- Wilcox, Robert K. Japan's Secret War: How Japan's Race to Build its Own Atomic Bomb Provided the Groundwork for North Korea's Nuclear Program. Third Edition: Revised and Updated – 10 December 2019

The author of this paper and other projects concerning the Japanese atomic energy and research programs of the period 1936 -1945 are available free on the Internet and include:

- Rider, Dwight. Hog Wild-1945: The True Story of How the Soviets Stole and Reverse-Engineered the American B-29 Bomber. 2013
- Rider, Dwight R. and Eric DeLaBarre. Tsetusuo Wakabayashi, Revealed. 2014
- Rider, Dwight R. Burn before Reading: The Japanese Atomic Bomb Program, the Battles of the Chosin Reservoir, and the Cave at Koto-ri. The Cell. 2016
- Dwight R. Rider, Dr. Eric Hehl and Wes Injerd. The "Kuroda Papers:" Translation and Commentary. 30 April 2017
- Rider, Dwight R. Japan's Biological and Chemical Weapons Programs; War Crimes and Atrocities: Who's Who, What's What and Where's Where. 1928-1945. 3rd Edition. 14 November 2018
- Rider, Dwight R. The Japanese Wartime Atomic Energy and Weapons Research Program – Seishin (Chongjin), northern Korea. 1938 – 1984. 22 March 2020

CAVEATS

It is not the purpose of this work to re-write the materials presented by other authors in their publications.

Where possible the lines and words contained herein are as they were found in existing publications, and are footnoted to the location where that line was copied to give its author full credit. Due to the liberal use of footnotes to source the materials used, quotation marks are rarely used. Where information can be found in several different locations independently, no footnote is used.

A full bibliography of sources used is presented at the end of this document. Readers are encouraged to fully access these sources.

In conducting this research some caveats, warnings and cautions apply. Additional caveats may apply and readers are encouraged to submit additional suggestions.

Nearly seventy-five years have passed since the Japanese nuclear energy and weapons research program was terminated through the invasion of Manchuria by forces of the USSR, US forces occupying Japan, and Chinese forces occupying formerly Japanese controlled territory in China. We are forced to look at the program from the distance of time.

The documentation surrounding the Japanese nuclear energy and weapons research program is incomplete for numerous reasons, some of which include:

> Japanese documents captured and held by forces of the former USSR remain largely unavailable and untranslated.
>
> Documents held in the US National Archives, while publicly available, remain scattered through numerous record groups and boxes. While many such documents have been identified, it is likely that the location of many such documents remain unknown.
>
> At the end of WWII, all Japanese military and many civilian industrial concerns were ordered to destroy all current documents and others then in archive. Many Japanese disobeyed the order.
>
> Occasionally documents stored for decades make their way back into public.
>
> Though some documents have been released, the full status of documents held in the People's Republic of China remains undetermined.

The Cold War (1947?-1991) has had an adverse impact on availability of information, its translation and acceptance. Cold War jargon is often found among post-WWII translations, such as the terms: "Japanese War of Aggression," "imperialism," etc.

The Japanese government has historically sought to downplay the past in all areas of the war and pre-war period, further limiting the amount of information available concerning its nuclear energy and weapons research program. The Japanese government and its military destroyed much of its official and archived documents in the days immediately following its surrender on 15 Aug 1945, leaving history with few official records to review. Because so many documents were destroyed by the Japanese at the end of the war, only a small window of official information exists which permits a view into the program.

Some of the people, places and events listed in this document may not have been directly involved with Japan's nuclear energy and weapons research program.

Due to its nature, the threads surrounding available information can leave a reader with a false impression of the number of units and people associated with Japan's nuclear energy and weapons research program.

The information discussed herein is simply that – information, and not evidence.

Any opinions expressed within the document are those of the author.

This document was built with the assumption that its readers would have some understanding of nuclear energy and weapons research programs prior to their reading of the information contained herein.

Research on Japan's nuclear energy and weapons research programs continues.

Much is made about the lack of US investigation into this subject immediately after the end of WWII. It should be understood that the postwar Japanese military and government went to extreme efforts to hide the achievements and nature of their nuclear energy and weapons research program. Almost a year passed from the end of the war until US investigators began to stumble upon and understand the size of Japan's program and its breadth. By the time US investigators realized the truth, the war had been over one year; the Japanese had that much time to bury the past.

The Railway of Infinite Regret
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The Great Pacific War

> *Three weeks ago, there was nothing there at all; now there is not only this vast bridge but steam engines limping slowly over it . . . it was characteristically Japanese, not only because it was a crazy wooden bridge that nevertheless functioned, but no other nation of the world in 1943 would have bashed and bullied, and sweated and slaved prisoners to such fantastic lengths for such an object.*[1]
>
> - John Coast, witnessing the completion of the Wam Po viaduct, 1943

Japan declared war against the Western powers primarily to obtain raw materials, especially oil, from European (particularly Dutch) possessions in South East Asia. At the time Japan attacked, those possessions were weakly defended due to the involvement of the Imperial powers in the ongoing war in Europe. World War II in the Pacific, or the Great Pacific War, was never more than one continuous crisis. Be it the attack on Pearl Harbor, the Battle of Midway, the war in Burma, or its atomic weapons and research program, it was simply one continuous chain of crisis. The pressures were everywhere – in China, the Pacific, along the Thai-Burma Railroad – and it would all end on the same day, 15 August 1945.

Japan's aggression was driven by a burning desire to expand its territory and improve its access to natural resources. It was the end of the Age of Empires, and to expand one empire meant to take territory from another. Japan saw an opportunity with the world in conflict, to seize resource-rich Dutch and British colonies (as the Dutch East Indies, Malaya, Siam and Burma), and to acquire and expand. Japan's aims were to occupy the area and then establish a defensive belt around these countries. By doing so, Japan would have sole possession of resources such as bauxite, phosphate and tin, which her economy badly needed, and most especially, oil to operate its military-industrial complex.[2] Japan's industrial base would convert raw materials obtained in those area into finished goods for sale, within the Empire or in support of its thinly-spread military forces. It would reap other resources which included rice, which was needed to support Japan's civilian population and the nation's wartime workforce. After all, there were no European powers in the East Far capable of preventing a Japanese invasion. It was a golden opportunity to acquire the territory and natural resources Japan so strongly desired in a fast-moving war followed by a negotiated settlement.[3]

The Japanese planned to occupy the Philippines to protect their flank as part of their plan for a "Greater East Asia War," in which their Southern Expeditionary Army Group seized sources of raw materials in Malaya and the Netherlands East Indies, as the Combined Fleet neutralized the United States Pacific Fleet. To accomplish this task, the Southern Expeditionary Army was created on 6 November 1941, commanded by Gen. Count Terauchi Hisaichi, who had previously served as Minister of War. Under Terauchi, the Southern Expeditionary Army was ordered to prepare for war in the event that ongoing negotiations with the United States did not succeed in peacefully meeting Japanese objectives.

Terauchi was to command four corps-equivalent armies, comprised of ten divisions and three combined-arms brigades, including the 14th Army. Operations against the Philippines and Malaya were to be conducted simultaneously as and when Imperial General Headquarters ordered. On 8 December 1941 in East Asia, 7 December in the US, Japanese forces entered Thailand, Imperial Japanese forces landed troops at Kota Bharu on Malaya's east coast, attacked ships docked at Pearl Harbor, and then attacked US and British warships anchored at Shanghai. WWII in the Pacific had begun.

Three days after the Japanese entered the Thailand, on 11 December, the Imperial Japanese Army presented a draft agreement for the military utilization of Thai railways to the Thai government.[4] On 21 December the government signed the document. However, primary documents in the National Archives show that the Japanese Army had already began using the northern, eastern and southern Thai railways as early as 9 December, days before Thai official agreement.[5]

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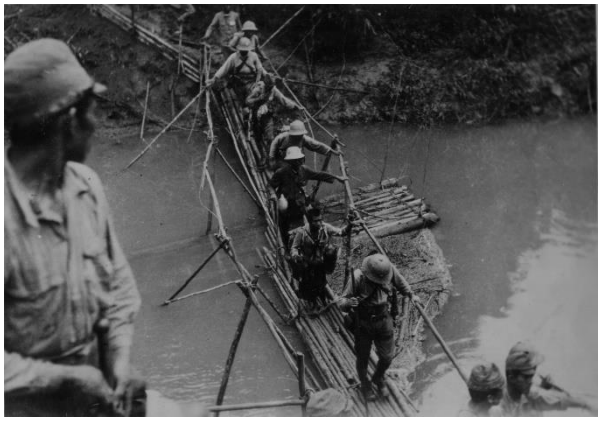
[1] HUANG, WAYNE. The Death Railway: Semblances of Modernity. DISCOVERIES
[2] CSI BATTLEBOOK. Imphal-Kohima. Combat Studies Institute. Fort Leavenworth, Kansas
[3] CSI BATTLEBOOK. Imphal-Kohima. Combat Studies Institute. Fort Leavenworth, Kansas
[4] Kiattisahakul, Puengthip. Assistant Professor, Faculty of Arts, Silpakorn University. Part Three: Economic and Cultural Issues. The Japanese Army and the Control of Southern Thai Railways, 1941-1945
[5] NA. Bo. Ko. Sungsut, 2. 4. 1. 6/3 Tarang kanchai rotfai khong kongthap Yipun pi 2485 [Table of Japanese Army train usage in 2485] (2 December 2484 [1941] - 2 December 2485 [1942]). Cited in: Kiattisahakul, Puengthip. Assistant Professor, Faculty of Arts, Silpakorn University. Part Three: Economic and Cultural Issues. The Japanese Army and the Control of Southern Thai Railways, 1941-1945

Burma



On 14 December 1942, on the heels of attacks into Thailand, Malaysia, Pearl Harbor and the Philippines, Japanese forces of the 15th Army landed at Victoria Point, the southernmost point of Burma. Within days, they were the masters of Mergui and Tavoy. Rangoon was bombed on 23 December and again two days later on Christmas day, badly damaging needed docks and harbor. On 28 December, at a ceremony in Bangkok, the Burma Independence Army (BIA), a Japanese-collaborationist and revolutionary army which fought for the end of British rule in Burma by assisting the Japanese in their conquest of the country, was officially formed. It had previously existed for some time as an underground pro-Japanese organization.

The BIA was created from a group of Burmese known as the *Thirty Comrades* who had received training from the Imperial Japanese Army in early 1941. The *Thirty Comrades* would later provide the political core of the Japanese puppet-state of Burma, supporting the requirements and demands of the Imperial Japanese Army throughout the country. Such support included easy access to all Burma's natural resources to include ores containing uranium. In the Japan-Burma Secret Military Agreement signed on 1 August 1943 at the time Japan granted Burma independence, the new Burmese government was obligated to provide to the Imperial Japanese Army, free-of-charge, any lands and buildings necessary for the prosecution of the war, aid the Japanese Army in commandeering and transporting anything else necessary, and to either exempt or reduce the taxes on any resources used by Japanese forces.[6]

According to Ba-Maw, a member of the *Thirty Comrades*, "there cannot be the slightest doubt that the hard-core, fire-eating militarists within the Japanese army behaved brutally and put Burma and her peoples as well as resources to their own military use even more brutally."[7] Japan's decision to seek active Burman collaboration committed her inescapably to generous recognition of Burman political aspirations.[8] Despite their service to the Japanese, the eventual State of Burma government had little freedom to exercise authority as the Japanese commander of the Burma Area Army remained in control.[9] Meanwhile, the British Empire in Burma was collapsing in a heap. The British withdrew from Moulmein after the fall of Singapore on 15 February 1942.

Occupying Burma

After the fall of Singapore, the Japanese brought in large numbers of captured British trucks and other vehicles into Burma from Thailand, allowing them to rapidly move troops and supplies forward. The Japanese also deployed motorized infantry columns, particularly against the Chinese forces in northern Burma. Unlike his army, the Japanese invasion commander, Lieutenant General Iida Shojiro, arrived in Rangoon via ocean transport. Logistically speaking, as the Japanese had proved with their earlier invasion of Burma, completion of a rail line was not a prerequisite to the successful prosecute of a war in Burma – completion of the line to move vast amounts of heavy uranium-rich ore or pre-existing mine tailings was. Rangoon fell on 9 March 1942.

On 28 April 1942 Allied Commanders, mostly British, decided to end their defense of Burma, withdrawing their forces into the area of the Indian border. It was a 900-mile retreat. After the British collapse of Singapore, the Japanese reinforced their two divisions in Burma with two additional divisions transferred north from Malaya. The Japanese had conquered all of Burma with only four divisions. The British Army in Burma was routed, but would return to the field in January 1943 in a ferocious attack on the Donbaik garrison.[10] In the summer of 1942, the Japanese 15th Army was composed of the 18th, 33rd, 55th and 56th Divisions. Rangoon, located over 3,000 miles from Tokyo, therefore became the "far outlier" of Japan's "Greater East Asian Co-Prosperity Sphere." Adding insult to injury, leading elements of the Thai Phayap Army under General J. R. Seriroengrit crossed the border into the Shan States on 10 May 1942. Three Thai infantry divisions and one cavalry division, spearheaded by armored reconnaissance groups and supported by the Royal Thai Air Force, engaged the retreating Chinese 93rd Division in northeastern Burma. Thailand then occupied Shan and Kayah States. The Kingdom of Thailand subsequently created "Saharat Thai Doem," the "Unified former Thai Territories." It was an auspicious beginning for what would forever remain a minor theater of a far greater war.

The March into India

After the initial conquest of Burma, and with the coming of the 1942 monsoon season, General Iida was queried by higher headquarters as to his opinion whether to resume the offensive into India after the rains ended. The Japanese sought to align themselves with Indian nationalists, and turn India and its people against the British. Iida, in turn, consulted the commanders of his

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[6] Trager, F.N. (ed.). Burma: Japanese Military Administration, Selected Documents, 1941–1945. Philadelphia: University of Pennsylvania Press. 1971

[7] Ba-Maw. Breakthrough in Burma. Memoirs of a Revolution, 1939-1945. Yale University Press. New Haven. 1968

[8] ARMY SERVICE FORCES MANUAL M354-18A, CIVIL AFFAIRS HANDBOOK JAPAN, SECTION 18A: JAPANESE ADMINISTRATION OVER OCCUPIED AREAS, BURMA. HEADQUARTERS, ARMY SERVICE FORCES. 2 AUGUST 1944

[9] Seekins, Donald M. Historical Dictionary of Burma (Myanmar). Historical Dictionaries of Asia, Oceania, and the Middle East, No. 59. The Scarecrow Press, Inc. Lanham, Maryland. 2006

[10] BURMA OPERATIONS RECORD: 15TH ARMY OPERATIONS IN IMPHAL AREA AND WITHDRAWAL TO NORTHERN BURMA. Japanese Monograph No. 134. PREPARED BY HEADQUARTERS UNITED STATES ARMY, JAPAN. DISTRIBUTED BY THE OFFICE OF THE CHIEF OF MILITARY HISTORY. DEPARTMENT OF THE ARMY. 10 October 1952. Revised

forward divisions, who all replied that the logistical problems involved with an invasion of India were a bridge too far.[11] General Iida was also not inclined to pursue the British into India. Plans for the attack into India were accordingly dropped. Postwar, continued planning for an advance into India was denied to have taken place in 1942; planning at some level nonetheless, had continued.[12] That is what militaries do, plan. Regardless, in September 1942, the Southern Army ordered the 15th Army to draft plans for an invasion operation against the Assam area of India. As Operation No. 21, the objective of the maneuver was to push into eastern India and take the initiative in implementing a political and strategic India policy, following the success of the Burma subjugation operation.

Operation No. 21 was the first of a series of plans which eventually led to the Imphal disaster.[13]

Iida was subsequently recalled to Japan for his pessimistic views of possible future operations against the British in India. One of his subordinates, Lieutenant General Renya Mutaguchi, commander of the Japanese 18th Division, was named as Iida's replacement. Mutaguchi, aggressive, would ultimately go on to plan and conduct the eventual ill-fated invasion of India and attack on Imphal (the U-go Offensive). General Iida was probably correct that holding Burma was far more important than an advance into India. The Japanese Army's culture of aggressive warfare, however, had worked against Iida's more common-sense approach.

Like the oil of the Dutch East Indies, pre-war Japanese planners sought to occupy Burma to obtain the country's natural resources. Pre-war Burma was a net exporter of rice. Burma was known at the time to be rich in minerals such as cobalt, wolfram and oil. Prior to the war, Burma was known to be one of the few areas where uranium-bearing ores might be found.[14] Under Japanese policy for the occupied Southern Regions after mining operations were restored, their control could be concentrated in the hands of a single company in any one locality for efficiency, but control over any single mineral or metal resource would be distributed among at least two companies in the occupied region as a whole, to avoid the "evil" of a monopoly.[15] The Japanese advance captured Burmese oil fields around Yenangyaung and an oil refinery near Rangoon. The shortage of petroleum products that were to plague the Japanese Empire to support automotive transport, as well as diesel for rail locomotives, was never an issue inside Burma.

In military terms the Japanese invaded Burma primarily to protect the flank of their main advance into Malaya and Singapore to provide a buffer to protect the territories they intended to occupy – Malaysia, Singapore and the Netherlands East Indies.[16]

An additional factor in Japan's decision to invade Burma was to eliminate the British and US-supported Burma Road into China. The road supported the movement of Western aid and munitions to Chiang Kai-Shek, who had been waging war against the Japanese for several years. Completed in 1938, the road linked Lashio in northern Burma with the Chinese Nationalist forces of Chiang Kai-Shek then in Yunnan province. Strategically, closing the road should force Chiang Kai-Shek to capitulate and end the Japanese war in China.[17]

Sans further Japanese advances into India, the railway was of little relevance to the maintenance of Japanese forces in Burma. Defensive stores of ammo could be easily maintained, the requirements of an offense into India however, were much higher.

Decision

According to Tadakazu Wakamatsu, a witness called at the International Military Tribunal for the Far East (IMTFE): "During the summer of 1942, the decision to construct the Burma-Siam Railroad was made by the [Army Section of the] Imperial General Headquarters in response to a request from the Southern Army. There were three purposes for this construction: (1) to have overland

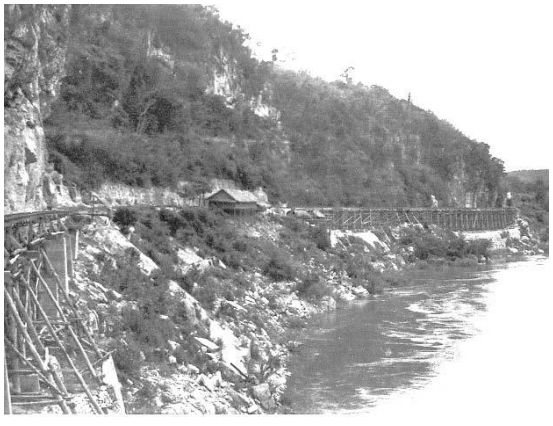
[11] McCormack, David. Japan at War 1931-45: As the Cherry Blossom Falls. Fonthill Media, 2016
[12] BURMA OPERATIONS RECORD: 15TH ARMY OPERATIONS IN IMPHAL AREA AND WITHDRAWAL TO NORTHERN BURMA. Japanese Monograph No. 134. PREPARED BY HEADQUARTERS UNITED STATES ARMY, JAPAN. DISTRIBUTED BY THE OFFICE OF THE CHIEF OF MILITARY HISTORY. DEPARTMENT OF THE ARMY. 10 October 1952. Revised
[13] BURMA OPERATIONS RECORD: 15TH ARMY OPERATIONS IN IMPHAL AREA AND WITHDRAWAL TO NORTHERN BURMA. Japanese Monograph No. 134. PREPARED BY HEADQUARTERS UNITED STATES ARMY, JAPAN. DISTRIBUTED BY THE OFFICE OF THE CHIEF OF MILITARY HISTORY. DEPARTMENT OF THE ARMY. 10 October 1952. Revised
[14] Uranium Project Research Meetings at the Nishina Research Laboratory and the 2nd Tokyo Army Arsenal. Background: Concerning Uranium. Tonizo Laboratory: Showa 18 – April 1943. Five sections, dated: 2 July 1943, 6 July 1943, 2 Feb 1944 and 17 Nov 1944. In Japanese. Obtained from the Riken Nishina Center for Accelerator-Based Science in 2006. Translation: Dwight R. Rider, Dr. Eric Hehl and Wes Injerd. April 2017.
[15] Trager, F.N. (ed.), Burma: Japanese Military Administration, Selected Documents, 1941–1945, Philadelphia: University of Pennsylvania Press, 1971
[16] Allen, Louis. Burma: The Longest War. Dent. 1984
[17] Bayly, Christopher; Tim Harper (2005). Forgotten Armies. London: Penguin

communication between Siam and Burma, (2) to provide necessary supply line for Japanese armies in Burma, and (3) exploitation of tungsten deposits needed in munitions manufacture along the route...."[18] If the railway could move tungsten out of Burma, the railway could also move uranium bearing ores.

Background

The Thai-Burma Railway – also known as the Death Railway, the Burma-Siam Railway, the Thailand-Burma Railway and similar names – was a 258-mile railway between Ban Pong, Thailand, and Thanbyuzayat, Burma, constructed by the Empire of Japan in 1943, ostensibly to support its forces in Burma during World War II. It was not however, the first Japanese attempt to connect Thailand to Burma by rail. Nor was it the last Japanese transport system built to supply their army in Burma and move out of that country its natural resources, such as uranium. That honor went to the worst of all such projects, the Mergui Road. The Death Railway was built entirely by the Imperial Japanese Army; no Japanese Naval forces are known to have participated in its construction or to have managed its use. However, as it was the inability of the Imperial Japanese Navy to protect ships west of the Kra Peninsula, it is likely that the Japanese Navy was aware of its construction. The Thai-Burma Railway project was only one of many great Japanese wartime projects that have been studied. The total number of Japan's wartime construction projects in Southeast Asia is unknown as records were not maintained or were destroyed after the war.[19] Others do however exist.[20]

A rail route between Burma and Thailand, crossing Three Pagodas Pass and following the valley of the Kwhae Noi River in Thailand, had been surveyed by the British as early as 1885, but the proposed course through hilly jungle terrain divided by many rivers was considered far too difficult an undertaking and was shelved. In 1937, Japanese engineers also surveyed a route from Thailand into Burma near the eventual location of the actual wartime railway. Japanese engineers involved with the project in 1937 estimated that the venture would require five to six years to complete — a time-span which, when under review in 1942, was far beyond the period most believed the current war would last.[21]



In May 1942, a single battalion from each of the 9th and 5th Railway Regiments were sent to Ban Pong and Thanbyuzayat respectively to commence survey work.[22] As actual construction of the railway began, Japanese rail survey teams preceded the workers, conducting a more accurate survey and denoting the precise placement of the rails to be laid. 2nd Lieutenant Mouri of the 1st Battalion of the 9th Railway Regiment led the survey from the zero-mile post at Nong Pladuk station in Thailand, marking the center line of the Burma-Thailand railway on the ground.[23] Once surveyors set the center line, 20 meters each side of the line were cleared of trees and other obstacles by the assigned cutting team which was then followed by the laying of the track bed.[24]

The route of the Thai-Burma Railway followed Ataran and Haungtharaw Valleys, through the Three Pagoda Pass, and down the Gue Hoi Meklogng Valleys to Kanchanaburi.[25] Approximately 189 miles of the line would, in fact, be built in Thailand; the remaining 69 miles in Burma. Along the route there would be over 60 rail stations located at varying intervals. 688 bridges would be required to span the numerous gorges, rivers and washouts that lay along the route; more than one per kilometer.[26] Many remain in operation today.[27] 681 of them were constructed of wood.

The Death Railway branched off from the existing southern Thai railway heading towards Kanchanaburi. The southern end of the line in Thailand connected to pre-existing rail lines, offering a near straight path to the capitol of Thailand, Bangkok, Phenom Penh in Cambodia, and then to Saigon in Vietnam. The southern railways were directly linked with the frontline battlefields in Burma and Malaya. The northern end of the line connected to existing railways in Burma south of Rangoon, forming a path to Moulmein just south of the capitol in Rangoon. In the three years and eight months that the Japanese Army was based in Thailand, the southern railway was the most important route used for transporting troops and supplies from Padang Besar to Alor Star, and from Sungei Kolok station to Kota Bharu in Malaya.[28] Outside of Asia, the most famous portion of the railway remains Bridge 277.

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[18] TADAKAZU WAKAMATSU. Direct examination by affidavit, Doc 2744, Ex. 1989. Summary of Proceedings of the INTERNATIONAL MILITARY TRIBUNAL FOR THE-FAR EAST. The United States of America, et al - vs - ARAKI, Sadao, et al – Accused. Court House of the Tribunal War Ministry Building, Tokyo, Japan Monday - 29 April 1946. Page of record, 14629.

[19] Witness back ground statement. Cyril Hew Dalrymple Wild. International Military Tribunal for the Far East. Court House of the Tribunal, War Ministry Building, Tokyo, Japan. Undated.

[20] CAMPBELL, GWYN. THE STRUCTURE OF SLAVERY IN INDIAN. OCEAN AFRICA AND ASIA. FRANK CASS. PORTLAND, OR. 2004

[21] Towle, Philip. Margaret Kosuge, and Yoichi Kibata. Japanese Prisoners of War. London. Hambledon Press. 2000.

[22] Warland, Andrew. Thai Burma Railway 1939 - 1945: 'F Force' Official Report. http://www.andrewwarland.com.au/FForce/FForceIntro.html

[23] Futamatsu, Yoshihiko. Across the Three Pagodas Pass, The Story of the Thai-Burma Railway. Renaissance Books. Ket, England. 2013

[24] Futamatsu, Yoshihiko. Across the Three Pagodas Pass, The Story of the Thai-Burma Railway. Renaissance Books. Ket, England. 2013

[25] Ahmad, Naris. ECONOMIC RESOURCES OF THE UNION OF BURMA. Technical Report. 71-61-ES. Project Reference: Series: 1T061101A9LA07. Series. ES-70. Earth Sciences Laboratory. U. S. Army Natick Laboratories May 1971

[26] Hornfischer, James D. In the Jungle of the Kwai - Ship of Ghosts: The Story of the USS Houston, FDR's Legendary Lost Cruiser, and the Epic Saga of Her Survivors. New York. Bantam. 2007

[27] The Thai-Burma Railway. Secrets of the Dead. Public Broadcasting System. 28 June 2008. http://www. pbs. org/wnet/secrets/kwai/the-thailand-burma-railway

[28] NA. Bo. Ko. Sungsut, 2. 4. 1/5 Khosanoe kandoen rot khabuan thahan Yipun. Cited in: Kiattisahakul, Puengthip. Assistant Professor, Faculty of Arts, Silpakorn University. Part Three: Economic and Cultural Issues. The Japanese Army and the Control of Southern Thai Railways, 1941-1945

The Bridge on the River Kwai

Bridge 277 was inadvertently immortalized by Pierre Boulle in his 1954 book and the later film, *The Bridge on the River Kwai*, a work of pure fiction, which forms the visual image of the rail line known to most Westerners today.[29] There are many however, who point out that Boulle's story, and the 1957 film based on the book, were total nonsense and did not accurately portray the ruthlessness of conditions and treatment of prisoners as they actually were; the prisoners were gaunt, starving skeletons laboring as slaves. There was no Bridge on the River Kwai. There was not even a River Kwai at the time in Thailand. There was a river known as the Kwai Noi, or Little Kwai and the rail line generally followed its course, but did not cross it. As for Pierre Boulle, he had never actually been in the country at all! When Boulle wrote the book, most records of the events on the Thai-Burma Railway were classified *Secret* or *Top Secret*.[30] While Boulle's work did much to force open files, undoubtedly some records remain classified to this day.

On the actual Thai-Burma railway, there were no bulldozers, no bucket loaders, no graders. The prisoners would be all those things. They were the dump trucks. They were steamrollers. They packed the railroad embankment by their bare feet walking over it.[31] Sadly though, the presence of all the prisoners and slaves laboring on the project has prohibited much of the questioning and investigation of past events that historians normally pursue. The movie did a lot to draw attention to what was unquestionably one of the largest war crimes to take place in East Asia during *The Great Pacific War*. However, there are deeper secrets buried in those jungles.

Postwar Japanese viewed the film as a "glorification of the superiority of Western civilization" because, according to the film, the British were able to build a bridge that the Japanese could not.[32] Truth, in fact, was that no Japanese engineer assigned to the bridge ever asked one British officer or other ranks for any advice concerning the construction of the rail line. The real railway was driven from end to end by Japanese ambition and know-how.[33] Many Japanese also resented the movie's depiction of Japanese engineers as incapable of building a bridge equal in quality to that built by British engineers held in prison, a point that Manhattan Project engineers were unlikely to argue with in the aftermath of their wartime achievements.[34] As for the true event…

Ultimately, it was bridge 277 that was to be attacked with the use of the first-ever example of a precision-guided munitions in American service, the VB-1 Azon MCLOS-guided 1,000 lb. ordnance on 23 January 1945.[35] Bad weather scrubbed the mission. Bridge 277 and its alternate, built to eliminate delays in case the main bridge was destroyed, would eventually be successfully bombed on 13 February 1945 by the Royal Air Force. Repairs were carried out by prisoner-of-war (POW) labor, and by April, the wooden trestle bridge was back in operation. On 3 April a second raid by Liberator bombers of the US Army Air Forces damaged the wooden bridge once again. Repair work continued and the two bridges were operational again by the end of May. A second raid by the RAF on 24 June put the railway out of commission for the rest of the war."[36]

Justifying the Rail

The Imperial Japanese Army justified construction of the railway as necessary to maintain their forces in Burma. The biggest problem facing the Japanese in Burma were their supply lines; almost all the war material and reinforcements needed in Burma had to be brought in the country via sea routes around the Malay Peninsula.[37] Lacking a rail, the Japanese were forced to bring supplies and troops into Burma by sea, through the Straits of Malacca and the Andaman Sea. The route was exceptionally vulnerable to attack by Allied submarines, and aircraft operating out of India, and a different means of transport was needed. In the long-term, however, the Imperial Japanese Army considered the railway as an investment that would in the future serve as trade route for traffic between Burma and Thailand.[38] Raw materials would come out, finished goods would be sent in. If it was not actually used during the war to transport material out of Burma, it was without doubt intended to at some point.

With the British actively contesting control of the Andaman Islands, a heightened sense of urgency descended over Imperial Japanese

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[29] Boulle, Pierre (1954). Bridge on the River Kwai. London: Secker & Warburg
[30] Rowland, Robin. Why Former POWs and their families hate and love The Bridge on the River Kwai (The Reception of The Bridge on the River Kwai among Former Far East Prisoners of War). David Lean Centenary Conference. Queen Mary University. London. 25 July 2008. Revised: 25 October 2008
[31] Hornfischer, James D. In the Jungle of the Kwai - Ship of Ghosts: The Story of the USS Houston, FDR's Legendary Lost Cruiser, and the Epic Saga of Her Survivors. New York. Bantam. 2007
[32] Hirakawa, Sukehiro. The Anglo-Japanese Hostilities from a Cultural Perspective. Japan Echo. Vol. 26, No. 6. December 1999 cited in the Bridge on the River Kwai. http://www. fepow-community. org. uk/monthly_revue/html/bridge_on_the_river_kwai.htm
[33] Hornfischer, James D. In the Jungle of the Kwai - Ship of Ghosts: The Story of the USS Houston, FDR's Legendary Lost Cruiser, and the Epic Saga of Her Survivors. New York. Bantam. 2007
[34] Pye, David. "The Price of Freedom." https://web. archive. org/web/20040219213625/ http:/www. davidpye. com/pow/index. htm
[35] Marion. "Old China Hands, Tales & Stories – The Azon Bomb." oldchinahands. Archived from the original on 6 March 2012. Retrieved 20 March 2012
[36] Historical Fact on the Burma Death Railroad Thailand Hellfire pass Prisoners conditions." Archived from the original on 18 January 2012.
[37] Building Burma's Notorious Death Railway. WWII QUARTERLY/ FALL 2018
[38] Part II. Matters of Investigation. General Outline. Report on the Employment of War Prisoner in Siam-Burma Railway Construction. IPS Document 1509-A, Exhibit 475. Bibliographic ID (link to National Diet Library Online) digidepo_10274234 pdf

Headquarters, which concluded that the army desperately needed an overland railroad supply route connecting Thailand with Burma. The project, officially named, "The Thai-Burma Rail Link,"[39] called for the conscription of hundreds of thousands of Asians, along with captured Allied prisoners of war, to build a one-meter gauge railway along the Kwhae Noi River from Thailand into Burma. The Japanese drew on three basic principles to guide construction: a vision, a "machine" to implement that vision, and a bureaucracy to operate that machine, with supervisors to manage the execution of the entire process.[40] Bureaucracies are impressive at creating and enlarging other bureaucracies.

The Machine

At the height of construction in mid-1943, over 60,000 Allied POWs and a quarter of a million Asian laborers slaved near continuously in the jungles of Burma and Thailand building the line. One in three would eventually die from disease, exhaustion, and the brutal treatment divvied out by their Japanese captors. Was it simply the need for supplies in Burma that required such loss of life in building a railway?

According to some surviving secret documents, in September 1943 in the area of Kanchanaburi – again, in September 1943 in the area of Kanchanaburi alone – there were 130,144 men recruited to construct the Thai-Burma Railway – 24,764 Japanese soldiers, 41,570 POWs, 40,900 Indian laborers and 22,190 Chinese laborers.[41] Even before diesel engine No. C5631 slowly chugged its way up the newly completed rails on its inaugural journey in October 1943, this rickety 250-mile track had garnered the infamous epithet, "The Death Railway." Despite the primitive location where the line was built, its construction was nonetheless an industrial process. With large numbers of POWs remaining in Singapore, if workers died from abuse or neglect, the solution was simple and efficient – dispose of the dead and ship in more. What kind of pressure could result in such callousness? The needs of the Imperial Japanese Army in Burma to hold a line which they knew they couldn't hold? Or a uranium bomb project necessary for the survival of the Japanese Empire?

In the traditional military manner, POWs were told: "Men are of no importance. The railroad has to be built irrespective of any suffering or death," or, "The construction of the railway has to go on without delay" as it was required for operational purposes, and had "to be finished within a certain time at all costs, irrespective of the loss of lives of British and Australian prisoners."[42]

Construction

For reasons connected to their treatment while constructing the Thai-Burma Railway, few prisoner memoirs can be relied upon in the search for information about Japan's atomic energy and weapons program, or the cargoes carried out of Burma on the rail line. In short, the POWs were starving. Their all-consuming concern was food.

The daily operation of the line was of no great interest to the prisoners. First and foremost, prisoners constructing the rail line were too weak from overwork and starvation to concern themselves with much more than basic survival. The lack of food and the cruelty of Japanese and Korean guards are the two main issues that dominate nearly all POW writings concerning the rail line. Had the rail been carrying food, the prisoners might have paid attention, but no such shipments were mentioned by captured Allied personnel. Most food sent up the line from Kanchanaburi to the camps in Thailand went by boat and ox cart.[43] Second, most diaries deal solely with the horror, the brutality, and the daily cruelty of existence under the thumb of the Japanese than Japan's long-term goals in building line. And rightly so.

One of the earliest and most respected accounts is ex-POW John Coast's *Railroad of Death*, first published in 1946 and republished in a new edition in 2014. Coast's work is noted for its detail on the brutality of some Japanese and Korean guards as well as the humanity of others. It also describes the living and working conditions experienced by the POWs, together with the culture of the Thai towns and countryside that became the home of many POWs after leaving Singapore on working parties sent to the railway. Coast also details the camaraderie, pastimes and humor of the POWs in the face of adversity.[44]

Few POWs actually observed daily operations along the rail line.[45] As sections of the rail line were completed, POWs were removed from that area to camps further up the line or back to Kanchanaburi. Lastly, though, about 30,000 prisoners were retained in Thailand and Burma after the line was completed to maintain the rail; only so many prisoner work details were sent back up-line to make repairs or conduct regular maintenance on the line. Apparently after the line was completed, the Japanese Army maintained the tracks using forced local labor. Those prisoners that were sent back up the line were normally involved in wood cutting in support of Japanese military camps or locomotives. Few memoirs ever note what the line was transporting into or out of Burma. One who did

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[39] HUANG, WAYNE. The Death Railway: Semblances of Modernity. DISCOVERIES

[40] Building Burma's Notorious Death Railway. WWII QUARTERLY/ FALL 2018

[41] NA. Bo. Ko. Sungsut, 2. 5. 2/4 Kankhlueanwai khong thahan Yipun nai changwat Ratchaburi-Kanchanaburi [Movements of Japanese soldiers in Ratchaburi and Kanchanaburi provinces] (28 February 2485 [1942] - 30 June 2488 [1945]). Cited in: Kiattisahakul, Puengthip. Assistant Professor, Faculty of Arts, Silpakorn University. Part Three: Economic and Cultural Issues. The Japanese Army and the Control of Southern Thai Railways, 1941-1945

[42] JUDGMENT INTERNATIONAL MILITARY TRIBUNAL FOR THE FAR EAST. PART B - CHAPTER VII and PART B - CHAPTER VIII. CONVENTIONAL WAR CRIMES (Atrocities). THE PACIFIC WAR. November 1948

[43] Futamatsu, Yoshihiko. Across the Three Pagodas Pass: The Story of the Thai-Burma Railway. Renaissance Books. Ket, England. 2013

[44] Coast, John. Railroad of Death. Myrmidon. 1946. Republished: 2014

[45] The Rail Road and Ore Shipments. E-mail between Dwight Rider and Rod Beattie, Director of the Japan, England, America, Australia, Thailand and Holland (JEATH) War Museum at Kanchanaburi, Thailand. 23 July 2008

was Edward ("Ted") Chaplin, Singapore Royal Artillery (Volunteer), Straits Settlement Volunteer Force.[46] Writing from on board HM Hospital Ship *Karoa* between Singapore and Sunda Straits in November 1945, Chapin noted that while at Bangkok, "The goods we were moving consisted of shoes, shirts, shorts, biscuits, paper, soap (of which I got two tablets), sugar, peas, beans, dried fish and a few other odds and ends. All this stuff was intended, I believe, for the armies then on retreat from Burma."[47] All that "stuff" mentioned was "stuff" the POWs sorely needed and could not have. Nothing else was mentioned – no tools, no barrels, no drums, nothing. POWs did note, however, a change with men and material coming out of Burma as the war drew to a close.

Conditions in the prison camps after the completion of the line never improved beyond sheer survival. Lastly, after the line was completed, most POWs worked on its supporting infrastructures, its rail yards, rail sidings, turning wyes, etc. After completion of the railroad, most recovering POWs were then sent to Japan, many were returned to Singapore, and some were sent to build the Sumatra or Palembang Railway from Pekanbaru to Muaro. Those left to maintain the line continued to suffer appalling living conditions as well as increasing Allied air raids.

In Operations

The Thai-Burma Railway was scheduled and managed from Bangkok. From 1942 until the end of WWII, the Japanese controlled every railroad in Southeast Asia. The rail lines of the World War II-era moved cargo in the form of people and material vast distances. Japanese-controlled rails moved resources obtained from Singapore, Thailand and Malay into Phnom Penh, Cambodia, then to the Mekong Delta Railways to Saigon, Point St. Jacques, Haiphong in French Indochina, and on to Japan via an Imperial Japanese Army cargo ship, a Mitsui- or Mitsubishi-owned Merchant Marine (Maru).[48] Ultimately, with the Thai-Burma Railway completed, the Imperial Japanese Army could move personnel and cargo from as far away as Moulmein in Burma, and Singapore, to Haiphong harbor in Northeast Indochina. Had *Operation Ichi-Go* (Operation Number One, a campaign of a series of major battles between the Imperial Japanese Army forces and the National Revolutionary Army of the Republic of China fought from April to December 1944) succeeded, they could have moved material from Burma overland as far as Mukden in Manchukuo, or Pusan in Korea – then directly into Japan, possibly extending the war by months or years.

Those Japanese soldiers who arrived in-country before the line was complete, or while it was under construction, reached the Burmese frontlines on foot. Some follow-on units destined for Burma which were located at Saigon in Indochina were transported to Bangkok by sea. In the case of the Thai-Burma Railroad, the Imperial Japanese Army is known to have moved parts of several divisions during the war into Burma from Thailand using the rail. However, the line primarily moved cargo.[49] Numbers for the amount of material moved into Burma are somewhat available; however, records for the volumes of material moved out of Burma into Thailand no longer exist.[50] Once completed on 17 October 1943, the railway would move 900 tons of cargo per-day.[51] From December 1943 to August 1945, the rail moved a total of 299,550 tons of military supplies into Burma.[52] A secret document which survived the war reported that within a period of only four months, from 1 July to 31 October 1944, the Imperial Japanese Army used 396 covered goods wagons to transport 120 pieces of artillery, along with bullets and shells. Twenty Autonomous Armored Vehicles (AAV), twelve ammunition carriers, and four armored tanks were also hauled into Burma. Moreover, there were seventy-eight closed wagons whose contents are not specified.[53] If there was unspecified and documented material going into Burma, there could be equally unspecified material such as uranium ore or yellowcake, coming out. It's hard to believe that nothing came out. That would have been a waste of resources – one of the reasons Japan invaded Burma in the first place.

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[46] Chaplin, Edward ("Ted"). SINGAPORE AND THE THAI RAILWAY, EXPERIENCES OF CAPTIVITY, 1942 – 1945. Singapore Royal Artillery (Volunteer), Straits Settlement Volunteer Force, Written October/November 1945

[47] Chaplin, Edward ("Ted"). SINGAPORE AND THE THAI RAILWAY, EXPERIENCES OF CAPTIVITY, 1942 – 1945. Singapore Royal Artillery (Volunteer), Straits Settlement Volunteer Force, Written October/November 1945

[48] Ahmad, Naris. ECONOMIC RESOURCES OF THE UNION OF BURMA. Technical Report. 71-61-ES. Project Reference: Series: 1T061101A9LA07. Series. ES-70. Earth Sciences Laboratory. U. S. Army Natick Laboratories May 1971

[49] BURMA OPERATIONS RECORD: 15TH ARMY OPERATIONS IN IMPHAL AREA AND WITHDRAWAL TO NORTHERN BURMA. Japanese Monograph No. 134. PREPARED BYHEADQUARTERS UNITED STATES ARMY, JAPAN. DISTRIBUTED BY THE OFFICE OF THE CHIEF OF MILITARY HISTORY. DEPARTMENT OF THE ARMY. 10 October 1952. Revised

[50] The Rail Road and Ore Shipments. E-mail between Dwight Rider and Rod Beattie, The Director of the Japan, England, America, Australia, Thailand and Holland (JEATH) War Museum at Kanchanaburi, Thailand. 23 July 2008

[51] The Effect of Air Action on Japanese Ground Army Logistics. United States Strategic Bombing Survey. Military Analysis Division. April 1947

[52] Davies, Peter. Japanese Shipping and Shipbuilding in the Twentieth Century: The Writings of Peter W. Davies. Kent. Global Oriental. 2010

[53] NA. Bo. Ko. Sungsut, 2. 4. 1. 6/15 Kanbanthuk yutthopakon thahan Yipun [Transport of armaments for the Japanese Army] (10 February 2486 [1943] - 9 November 2487 [1944]). Cited in: Kiattisahakul, Puengthip. Assistant Professor, Faculty of Arts, Silpakorn University. Part Three: Economic and Cultural Issues. The Japanese Army and the Control of Southern Thai Railways, 1941-1945

The railway is well-documented to have transported Japanese Army sick and wounded out of Burma to Bangkok. The rail is known to have moved oils, food, ammunitions and other materials into Burma in support of its Japan's military forces. There are, however, few existing archival records regarding the specific cargoes carried along the rail from Burma into Thailand; however, trains rarely go somewhere and return completely empty. Few sources provide solid evidence that the trains, once in Burma, ever brought any cargo over the line on the return trip to Thailand. There are however snippets, rumor, memories that do admit that some form of cargo was indeed moved from Burma to Bangkok. It is known that some of the trains actually ran from as far as Moulmein in Burma directly to Phnom Penh, then part of Indochina.[54] These long-distance hauls in particular are likely to have carried sensitive materials, special cargoes and other materials, such as uranium, that had to be transported secure from attack to as near Japan as possible. Rangoon, Bangkok, Haiphong and Saigon, are all likely to have been used to move uranium bearing materials to Japan. Other than raw ore on railcars (unlikely due to the space required), or barrels containing yellowcake, there was nothing to see, nothing remarkable or memorable.

In the days and weeks immediately following Japan's surrender, the Imperial Japanese Army ordered all wartime documents to be burned.[55] This especially included all information related to Japan's treatment of Allied POWs and information on its biological, chemical and nuclear weapons programs. After the Japanese surrender on 15 August 1945, Japanese forces along the rail line had weeks to destroy any paperwork and related documents before Allied forces moved into Southeast Asia. Postwar, Allied prisoners held at Kanchanaburi reported the destruction of all records.[56] Of course, some documents survived. As such, there are few existing, few known records regarding the specific cargoes carried along the rail between Burma and Thailand. There are however records indicating that Japan obtained lepidolite (a source of lithium) and columbite (a source of uranium) "from south," meaning the South Seas Area, the Southern Expeditionary Army.[57] The Japanese generally referred to the area as Nan'yo, which was partitioned into "Inner" Nan'yo (Mandated Islands) and "Outer" Nan'yo (Southeast Asia).[58]

The action denied future historical researchers any insight into the construction of the Thai-Burma Railway and its daily operations from the Japanese side of the issue. It also denied postwar Allied investigators accurate information concerning Japanese war crimes, and information on Japan's various wartime weapons-of-mass destruction programs (WMD). Over a long period of time and intense research however, some supporting information regarding the uses of the railroad would be revealed.

Suggestions of Uranium Transport

Suggestions that the construction of the Thailand–Burma Railway was closely related to the Japanese atomic weapons and nuclear research program of WWII were first made publicly in Arnold C. Brackman's book, *The Other Nuremberg: The Untold Story of the Tokyo War Crimes Trials*.[59] Brackman, a witness to the IMTFE (also known as the Tokyo Trials), hinted that construction of the rail was a means to move uranium out of Burma. The rumor was an undercurrent among observers at the trial, the talk of smoky rooms and packed bars, but one that was never presented in open court.[60] It was one of many undercurrents that existed at the court, but were rarely mentioned at the trial. Japan's long running biological warfare program serves as the best documented such example.

Postwar, the Adjutant General's Office (US) in Tokyo, Japan, investigated, identified, and tracked individuals previously associated with Japan's biological warfare program, erroneously referred to as "Unit 731," identifying more than twenty people who it believed should be charged with war crimes and brought to trial. Such units normally operated under the cover term, "Epidemic Prevention and Water Supply Unit." To put an end to further possible interference by the Adjutant General's Office or justice, the Joint Chiefs of Staff sent an order to Tokyo in Mar 1947 that placed the Adjutant General's Office's biological warfare war crimes investigations under the control of US Army Intelligence (G-2). Unfortunately, the Army's cone of silence surrounding Japan's biological warfare centered primarily on, and was solely effective, only in Tokyo. Information concerning Japan's biological warfare programs and its units in the Japanese Empire eventually slipped through the hands of controlled archives censors into the public square.

Along the Thai-Burma Railway itself, the Epidemic Prevention and Water Supply Unit of the Southern Field Railway Headquarters was under the direct control of the Headquarters Medical Department. It was in charge of epidemic prevention and water supply along the Thai section of the Thailand-Burma Railway. An inspection office, composed primarily of personnel of the Epidemic Prevention and Water Supply Unit, was established at Wanyai Prison Camp along the Thailand-Burma Railroad to stop the movement of Asian workers from areas experiencing outbreaks of cholera. In Burma, a Malaria Prevention Group was headquartered in Rangoon,

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[54] Ahmad, Naris. ECONOMIC RESOURCES OF THE UNION OF BURMA. Technical Report. 71-61-ES. Project Reference: Series: 1T061101A9LA07. Series. ES-70. Earth Sciences Laboratory. U. S. Army Natick Laboratories May 1971

[55] "Such sparse records as do exist are clearly incomplete. Indeed, a Japanese NNN Documentary about the railway broadcast on Kansai' s Yomiuri Television channel on July 23rd 1995, claimed that the Japanese military had purposely burned all documentation on Asian labourers at the war' s end. Cited in: Boggett, David. NOTES ON THE THAI-BURMA RAILWAY, PART II: ASIAN ROMUSHA; THE SILENCED VOICES OF HISTORY. http://www. aiipowmia. com/wwii/thaiburma.pdf

[56] Boggett, David. NOTES ON THE THAI-BURMA RAILWAY, PART II: ASIAN ROMUSHA; THE SILENCED VOICES OF HISTORY. http://www. aiipowmia. com/wwii/thaiburma.pdf

[57] Report on the Rare Element Ores handled by the Nippon Kigenso Toseikurmiai (Japan Rare Element Controlling Association. G. Yamashiro. Science and Technical Division. ESS/GHQ. Tokyo. 22 March 1948. Bibliographic ID (link to National Diet Library Online) 000006846573

[58] MATSUI, MASATO. MINAKO I. SONG AND TOMOYOSHI KUROKAWA. NAN'YO (SOUTH SEAS). AN ANNOTATED BIBLIOGRAPHY. CENTER FOR ASIA AND PACIFIC STUDIES. ASIA COLLECTION. COUNCIL FOR JAPANESE STUDIES. UIVERSITY OF HAWAII. HONOLULU, HAWAII. Honpo Shoseki Press, Tokyo. 1982

[59] Brackman, Arnold C. The Other Nuremberg: The Untold Story of the Tokyo War Crimes Trials. Quill, William Morrow, New York. 1987

[60] Brackman, Arnold C. The Other Nuremberg: The Untold Story of the Tokyo War Crimes Trials. Quill, William Morrow, New York. 1987

Japanese Occupied Burma. In 1943, an Epidemic Prevention Center was also established in Rangoon.[61] Unit 113 and Epidemic Prevention and Water Supply Unit served as yet another organization located in Burma. Unit 2625, an Epidemic Prevention and Water Supply Unit based in Tokyo, later made its way to Burma under the Burma Area Army. A more ominous unit, Unit 6834, known as the Burma Expeditionary Unit, was also in Burma. Unit 10282 and Unit 12367 were also present.[62] Another unit, 17113, was located in Bangkok.[63] Unit Oka 9420 was located in Singapore. In late June 1945, Oka 9420 was relocated to Laos for no apparent reason, leaving no evidence behind of its previous existence in Singapore.[64] All such units were to remain hidden and unknown to the general public for decades.

The Joint Chiefs, in their message to the Adjutant General's Office (US) in Tokyo, made it abundantly clear that, "Every step, interrogation, or contact must be coordinated with this section. The utmost secrecy is essential in order to protect the interests of the United States and to guard against embarrassment."[65] The war crimes investigators were directed to make no effort toward prosecution or "any form of publicity of this case [biological warfare] without G-2 concurrence." This "is by direct orders of the C-in-C and CS."[66] Their final instructions were that "all future interrogations will be conducted at the Tokyo Office under control of ATIS Central Interrogation Center (US), Tokyo, Japan and previous undeveloped leads set out for the field offices are canceled," thus undercutting justice.[67] If the US Joint Chiefs of Staff could ignore away some 20,000 to 30,000 Japanese who were aware of Japan's biological warfare program, it could surely ignore away some several dozens of Japanese who might have been fully aware of the breadth and reach of the country's wartime atomic energy and weapons research program.

With US national interests at stake in an era of growing Cold War, no one would ever be held responsible for Japan's biological warfare program. None of the Imperial Family of Japan would ever be held responsible for any part in the war. Perhaps it was best that the war crimes trials never achieved their goal of forcing those who went through the process to recognize any culpability for an aggressive war and wartime atrocities. There was no great awakening, no one repented.

In the atmosphere that existed at the IMTFE, where most in attendance sensed justice would never be served, no one made mention of Japan's wartime atomic energy and weapons programs. The Manhattan Project's achievements and its superior commitment to secrecy would never be questioned. How would the American public react if it knew that all those achievements that resulted in a weapon to end all wars were not strictly reserved to the United States? Scant though evidence might seem, Brackman's statement would eventually find support mostly in the timeline of events surrounding the war in Asia – the Japanese bomb project against the construction of the rail.

Interest in Uranium

Long before its conquest of Burma, the Japanese had identified Burma, along with areas of northern Korea and China, as potential sources of uranium bearing ores.[68] The Imperial Japanese Navy was the first branch of the Japanese government to express interest in a nuclear weapon. Its modest investigation of 1934, conducted under its B-Research Program, concluded that nuclear weapons were not feasible at that time.[69] B-Research was the world's first military atomic energy and weapons research project. Neither Nishina Yoshio nor Iimori Satoyasu attended the meeting and were never involved in Project A or Project B, otherwise known as A-Research or B-Research. Project A was centered on the development of radar.[70]

In documents assembled by the Tokyo 2nd Army Arsenal in 1938, Nagaoka Hantaro had suggested that uranium would be present in the area of Burma.[71] He was speaking from a position of authority. Long before the war, Japanese mineralogists and geologists had surveyed much of Southeast and East Asia, mostly for raw materials of importance to Japan's steel industries. Japanese interests in minerals at that time included manganese, chrome, nickel, ferro-chrome, ferro-silicate, dolomite, and fluorspar, to name just a few. Everything found during these surveys was documented. While most of these surveys were openly conducted, Japan on occasion sent "special missions" to different area to survey certain deposits.[72] Through 1935, Japanese geologist Naito Y. had studied portions of

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[61] Harris. Sheldon H. Factories of Death Japanese biological warfare 1932 - 45 and the American cover-up. Routledge. London. 1994

[62] Field Water Supply and Purification Departments. (Yasen Bōeki Kyūsuibu) 野戦防疫給水部

[63] Field Water Supply and Purification Departments. (Yasen Bōeki Kyūsuibu) 野戦防疫給水部

[64] Secret War Experiments in Singapore. BiblioAsia. 2019 National Library Singapore/ http://www. nlb. gov. sg/biblioasia/2018/04/19/secret-war-experiments-in-singapore/

[65] Report by Neal R. Smith, Report of Investigation Division, Legal Section, GHQ, SCAP, 18 Apr 1947, p. 1. The Joint Chiefs' instructions were referred to in this report as SWNCC 351/1, 5 Mar 1947. Record Group 331, Box 1434. 20, Case 330, The National Archives

[66] Report by Neal R. Smith, Report of Investigation Division, Legal Section, GHQ, SCAP, 18 Apr 1947, p. 1. The Joint Chiefs' instructions were referred to in this report as SWNCC 351/1, 5 Mar 1947. Record Group 331, Box 1434. 20, Case 330, The National Archives

[67] Report by Neal R. Smith, Report of Investigation Division, Legal Section, GHQ, SCAP, 18 Apr 1947, p. 1. The Joint Chiefs' instructions were referred to in this report as SWNCC 351/1, 5 Mar 1947. Record Group 331, Box 1434. 20, Case 330, The National Archives

[68] Uranium Project Research Meetings at the Nishina Research Laboratory and the 2nd Tokyo Army Arsenal. Background: Concerning Uranium. Tonizo Laboratory: Shyowa 18 Nen – April 1943. Five sections, dated: 2 July 1943, 6 July 1943, 2 Feb 1944 and 17 Nov 1944. In Japanese. Obtained from the Riken Nishina Center for Accelerator-Based Science in 2006. Translation: Dwight R. Rider, Dr. Eric Hehl and Wes Injerd. April 2017

[69] Mun-Keat Looi Genshibakudan to Genshiryoku: Japan and nuclear science. 3 August 2015 https://medium. com/@ayasawada/genshibakuden-to-genshiryoku-japan-and-nuclear-science-d59538884d6f#. 7439skj1x

[70] The Pacific War Research Society. The Day Man Lost: Hiroshima, 6 August 1945. Kodansha International. Tokyo, Japan. 1981

[71] Uranium Project Research Meetings at the Nishina Research Laboratory and the 2nd Tokyo Army Arsenal. Background: Concerning Uranium. Tonizo Laboratory: Shyowa 18 Nen – April 1943. Five sections, dated: 2 July 1943, 6 July 1943, 2 Feb 1944 and 17 Nov 1944. In Japanese. Obtained from the Riken Nishina Center for Accelerator-Based Science in 2006. Translation: Dwight R. Rider, Dr. Eric Hehl and Wes Injerd. April 2017

[72] The Third Meeting. Wednesday, 31 August 1949. Memorandum Report of the Sub-Committee on Iron and Steel. Bangkok, Thailand, August 29 to September 2, 1949. Bibliographic ID (link to National Diet Library Online) metals digidepo_8341993 pdf

Burma in some detail, research of which Nagaoka Hantaro was aware.[73] Riken's Iimori Satoyasu subsequently researched earlier reports of uranium in Burma to ensure their accuracy and proved Nagaoka correct.[74]

In 1939, a rumor spread among top Imperial Japanese Navy officers that US scientists in California had succeeded in powering a small turbine with nuclear energy. This, together with the 2 February 1941 US embargo on uranium exports, convinced leaders of the Imperial Japanese Navy to take action.[75] The Imperial Japanese Navy was keen to find a new source of propulsion for its capital ships as well as powerful new weapon.

By mid-1939, Japanese scientists along with most other physicists throughout the world had recognized the potential of Otto Hahn's discovery of fission. Within uranium-235 (U^{235}) lay vast potential energy. Before the war and the Manhattan Project, there were few uses for uranium other than its use as a coloring in the production of porcelain. Many also saw in fission the potential for a weapon of tremendous power. They also realized that to obtain sufficient amounts of U^{235} to develop such a weapon, large amounts of uranium bearing ores would need to be located (looted), mined (stolen) and enriched.

Uranium bearing ores

Through its early studies, Japanese scientists had identified uranium-bearing ores as a necessity, a requirement whose demand would only increase as time and WWII dragged on and access to ores in the Belgian Congo was denied. As with the US Manhattan Project, the U^{235} in these ores obtained would be separated out through some enrichment process using large industrial-type facilities much like those of the Manhattan Project but located in Japan, China, Korea and Manchuria. Material could start out in Japan where, using flotation at Riken Kigenso Kougyou Kabushikigaisha (Riken Rare Element Industry Co) No. 806, uranium was recovered from the monazite, turned into yellow cake, and then sent to China, Korea and Manchuria as required. The reduction of ore to yellowcake could often be accomplished at the mine itself, which is suspected to have occurred in Burma as solvents and acids were locally available and facilities such as those at the Bawdwin Mine were already in-place.

The key term was "uranium bearing ores," accounting for the large amounts of thorium-rich monazite spoils found in Japan after the war. The Japanese had long since discarded the idea that thorium could be used in a bomb with the technologies of that time. The cross-section of thorium was much larger than that of uranium. It might be possible to generate fission in thorium, but to maintain that fission, contain it and continue it long enough to result in a catastrophic high-energy burst was difficult at best. The large piles of highly radioactive monazite-bearing ores, rich in thorium, found in Japan after the war, merely represented the remnants of the former uranium-bearing ores that had once been brought to Japan in support of its atomic energy research and weapons program of the war. Once in Japan these ores had been processed to remove its uranium. Highly radioactive due to its high thorium content, the US – seeking to corner the world market on uranium and thorium – quickly confiscated these spoils, and then in 1948, transported the worked ore to New York and California.[76,77] It is more likely that the term "monazite" was not used by the Japanese during the war solely in reference to thorium ore but as a catchall term that covered uranium, zircon and other minerals.

By the late-1930s, the Imperial Japanese Army's Lieutenant-General Yasuda Takeo had also developed an interest in nuclear physics; specifically, the potential for large energy releases through nuclear fission. In 1940, as chief of the Japanese Army Aviation Technology Research Institute, Yasuda initiated the first serious inquiry concerning a nuclear weapon by the Imperial Japanese Army.

In April 1940, Yasuda ordered Lieutenant Colonel Suzuki Tatsusaburo to investigate. Suzuki consulted with his former professor, Sagane Ryokichi of the Tokyo Imperial University, on the matter, and in October 1940, Suzuki produced a 20-page report concluding that the manufacture of atomic bomb was indeed possible and that Japan might have the uranium resources required to build one. Suzuki's paper was the Japanese equivalent of London's MAUD Report, which would become instrumental in persuading the US to invest in its own atomic energy and weapons research program, the Manhattan Project.

The Bawdwin Mines

In Burma, the Bawdwin Mines, located to the northeast of Mandalay, were an important prewar source of lead, zinc, copper and other metals. Prior to the war, Bawdwin produced up to 500,000 tons of ore annually.[78] The mine's offices, smelter, and other facilities

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[73] U. S. Geological Survey. Geological Survey Bulletin. United State Government Printing Office, Washington DC. Issues 983-984. 1952

[74] Occurrence of Radioactive Minerals in Former Japanese Controlled Areas. Department of the Army (Strategic) Intelligence Division. 7 October 1948. Record Group 331. Stack Area 290. Row 24 Compartment 2. Shelf 1. Entry 224. Box 2. The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD

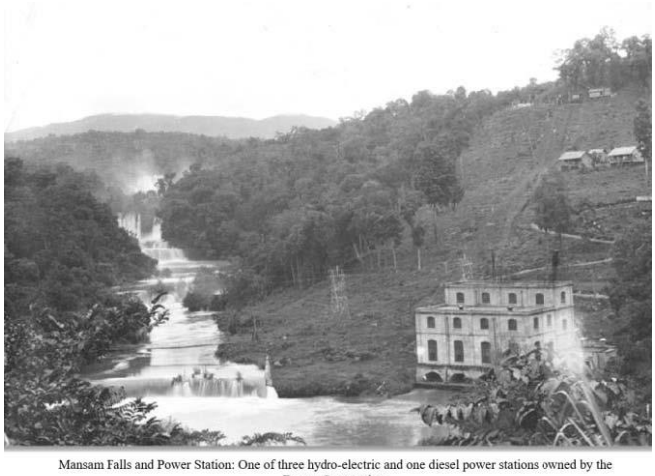
[75] State Department order to customs officials, 29 January 1941, Ibid., p. 241; Executive Order No. 8668, 4 February 1941, supra, pp. 242-243; Executive Order No. 8693, 25 February 1941, supra, pp. 249-250; Executive Order No. 8694, 25 February 1941, supra, pp. 253-254; Executive Order No. 8702, 4 March 1941, supra, pp. 255-257; Executive Order No. 8703, 4 March 1941, supra, pp. 257-258; Proclamation No. 2468, 27 March 1941, supra, pp. 258-260; Proclamation No. 2475 and No. 2476, 14 April 1941, supra, pp. 260-261;

[76] Agreement Between the United States and the United Kingdom for the Establishment of the Combined Development Trust. 13 June 1944. FOREIGN RELATIONS OF THE UNITED STATES: DIPLOMATIC PAPERS, 1944, GENERAL: ECONOMIC AND SOCIAL MATTERS, VOLUME II. Office of the Historian, Foreign Service Institute. United States Department of State. Lot File 55D540, Box 2

[77] Army Ocean Manifest. Vessel: Resolute. From: Yokohama. To: New York POE. Loaded at: South Pier. Date: 2 Sept 1948/ Class: Chemical. Page: 1. Record Group 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

[78] GARDINER, NICHOLAS J., LAURENCE J. ROBB, MICHAEL P. SEARLE, KYI HTUN & KHIN ZAW. The Bawdwin Mine, Myanmar: a review of its geological setting and genesis. Department of Earth Sciences, University of Oxford, UK

were in Namtu, 12 miles from the mine at Bawdwin; the mine's hydroelectric plant was a further 28 miles away at the Mansam Falls on the Nam Yao River.



Mansam Falls and Power Station: One of three hydro-electric and one diesel power stations owned by the Burma Corporation.

In January 1942, the Under-Secretary of State for War, Sir Frederick Bovenschen, and Sir Eric Speed made the following statement in the House of Commons: "The 'scorched earth policy' has been, and will continue to be, pursued in the Far East to the maximum extent that is practicable. The denial of resources to the enemy has long been the policy of His Majesty's Government."[79] Molybdenum and vanadium were available in Japan and Korea only in small quantities and air operations in Burma made mining dangerous and difficult, but obviously, as Japan fought on from 1942 to 1945, it was not impossible. Cobalt did not exist within the Japanese Empire at all, except for the Bawdwin Mine.[80] If not from Burma, how did Japan meet its needs for the cobalt? If the mine's separators could produce cobalt, they could produce uranium oxide, yellowcake.

Patrick "Red" Maddox, born in Tavoy, Tenasserim, in 1913, joined the Consolidated Tin Mines of Burma in 1933 as a prospecting engineer. Fluent in Urdu, Burmese, Tavoyan and Karen, he was recruited by the Special Operations Executive (SOE) in November 1941 and assigned to the Bush Warfare School, Maymyo, under Major Mike Calvert (the "chindit"). In April 1942, Maddox was ordered "to go to Namtu and make certain that the very well-equipped machine shop, in particular, and power plants supporting the Bawdwin Mines were adequately destroyed."[81] The Japanese, now in Lashio (67 kilometers away), were already aware that destroying the Bawdwin Mines operation would be a priority to British forces. Despite foreknowledge, the Japanese were unable to react.

Disguised as a Shan, Maddox infiltrated the area, avoiding roads and villages and carrying his own explosives across jungle-shielded hills. As Maddox was entering the country. The Burma Corporation was evacuating and burying its accumulated inventory of silver.[82] The mines and facilities were simultaneously blown on 24th April 1942. Maddox walked 241 kilometers north and out of Burma via Myitkyina to Fort Hertz (now Putao) in Kachin State. He then again, moved overland on foot covering another 600 kilometers in two months to Kunming in China. He flew back over the Hump (the Himalayan Mountains) to Assam and received the Military Cross for his "high qualities of endurance, courage and resourcefulness." Transferring to the OSS, he continued his infiltrations.[83] The mine's ore concentrators, however, were not destroyed. Despite the damage from the British 'denial' program and Allied bombing, Burma's contribution to the flow of raw materials to Japanese industries in the home islands was said to be significant.[84]

Burmese and Siamese railroads, Singapore and Saigon dockyards, and tactical targets in Burma and Malaya were the principal objectives of Twentieth Bomber Command attacks in Southeast Asia.[85] If the US had known about Japan's atomic energy and weapons research program and had secretly sought to disrupt it, there would have been no visible difference in target selection for this, when compared to attacks on Japan's logistical support system. The logistics, costs and secrecy required for a war and a uranium weapons program are much the same. If the mine was operated solely to extract uranium from other mine spoils, it would have been easier to ship the finished product.

Shipping yellowcake costs less than shipping raw ore. It also took up less space, but, depending on the purity, could be extremely heavy. Once enriched at the Bawdwin Mine, the quality of the product would be determined in Tokyo, with the product sent from Tokyo into China, Korea and Manchuria where it would then undergo further enrichment.[86] This cycle would repeat itself as much as required through the different processes installed at various locations until the materials reached about 85% purity.

From 1942 through to the end of the war, the Japanese continued to work the Bawdwin Mine extracting a postwar estimated 200,000 tons of high-grade ore.[87] As the mine's power plants were destroyed, how did the Japanese operate the mine? Did they mine the actual mine or did they bring in other ore from other mines for concentration? If they mined 200,000 tons of high-grade tin ore, how did they move it to Japan to produce a finished product? If the Japanese could move tin and tungsten from the Bawdwin Mine to Japan, they could also move uranium. How the Japanese worked the Bawdwin and other mines is not known. It is known, though, that many of

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[79] BURMA. HC Deb 12 December 1944 vol 406 cc1058-128. 1058. 12. 3 p. m. https://api. parliament. uk/historic-hansard/commons/1944/dec/12/burma

[80] THE EFFECTS OF STRATEGIC BOMBING ON JAPAN'S WAR ECONOMY. Appendix ABC. OVER-ALL ECONOMIC EFFECTS DIVISION. THE UNITED STATES STRATEGIC BOMBING SURVEY. U.S. Government Printing Office. Washington, D. C. December 1946

[81] INWA Advisors. The Bawdwin Mine. http://inwa-advisers. com/features/the-bawdwin-mines/

[82] INWA Advisors. The Bawdwin Mine. http://inwa-advisers. com/features/the-bawdwin-mines/

[83] INWA Advisors. The Bawdwin Mine. http://inwa-advisers. com/features/the-bawdwin-mines/

[84] Boldorf, Marcel and Tetsuji Okazaki Economies under Occupation The hegemony of Nazi Germany and Imperial Japan in World War II. Routledge. Taylor and Francis Group. London and New York. 2015

[85] THE EFFECTS OF STRATEGIC BOMBING ON JAPAN'S WAR ECONOMY. Appendix ABC. OVER-ALL ECONOMIC EFFECTS DIVISION. THE UNITED STATES STRATEGIC BOMBING SURVEY. U.S. Government Printing Office. Washington, D. C. December 1946

[86] Untitled Document. Record Group 226. Stack Area 250. Row 64 Compartment 33. Shelf 2-3. Entry 211. Box 31. Folder: WN20231 (2/2). The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD

[87] INWA Advisors. The Bawdwin Mine. http://inwa-advisers. com/features/the-bawdwin-mines/

Burma's mines only operated during the dry season, leaving some Burma's manpower free for other purposes,[88] such as working on the rail line. The Thai-Burma Rail began construction in a dry season and ended a year later near beginning of that year's dry season.

Though the Bawdwin Mines were officially under the direct control of the Japanese army, they were in effect under the management of Mitsui Kozan (Mitsui Mining). Additional mines were established across Burma, China, Indonesia, Korea, Malaysia, Manchuria, Thailand, and Vietnam at unimaginable costs. POW and Asian slave labor were used to build airfields, roads and railroads to move the needed ore from the aforementioned areas to Japan at the expenditure of thousands of lives. Even before the construction of the Thai-Burma Railway, the Imperial Japanese Army's need for labor was tremendous.

The Institute of Physical and Chemical Research

Unlike the US with its Manhattan Project, Japan's major and most well-known atomic energy and weapons research programs were managed or involved with an existing company, a leader in cutting-edge science, Rikken, The Institute of Physical and Chemical Research. When the Imperial Japanese Army or Navy sought a new weapon based upon the latest science, they turned to Rikken.

Founded in 1917 during the First World War (WWI), the Rikken Institute functioned as a stock-holding company, owning its own patents. The companies under its control manufactured inventions developed by the institute, returning a substantial portion of their profit directly to the institute. Rikken (postwar its name was shortened to "Riken") was a business venture, but its ultimate purpose was to advance science, not to make money, sometimes leaving its financial position insecure.[89]

Under its third director, Okouchi Masatoshi, Rikken expanded rapidly during the first half of the 1920s.[90] The notion of "scientific industry" summarizes Okouchi's efforts. Contradicting normal business concepts of the time, Okouchi believed that science was something that should be applied directly to industry. As director, Okouchi proposed the company reform itself into an industry that would serve science by marketing its scientific achievements, and returning profits to the institute for further research and development.[91] In part to accomplish these goals, Okouchi reorganized the structure of Rikken to make it more "egalitarian."[92]

Formerly, Rikken had consisted of two divisions, chemistry and physics, each headed by two elder physicists, Nagaoka Hantaro and Baron Sakurai Joji, with all subordinate research groups assigned to one of them.[93] This resulted in a hierarchical structure between division leaders and group leaders. In this system, a researcher at Rikken was either a chemist or physicist, and by necessity, an underling of either Sakurai or Nagaoka. Okouchi abolished this two division-system and made all group leaders equal in status, enabling Rikken scientists to conduct interdisciplinary research incorporating physics, chemistry and other scientific fields.[94] At Rikken, scientists such as physicist Nishina Yoshio and radio-chemist Iimori Satoyasu flourished, eventually operating entire laboratories known worldwide bearing their names.

A private institution, Rikken prided its supremacy over national universities, fermenting a rebellious air of solid and applied achievements over academic tenure. Salaries at Rikken were set higher than those at imperial universities for the sole purpose of draining away better minds from universities to work for Rikken.[95] At Rikken, a recent graduate of university could be hired as a research student (kenkyusei) or a research associate (joshu). A graduate of an imperial university could also work at Rikken while pursuing their graduate studies as a "research student," which, as a paid position, served as a form of graduate scholarship.[96] Group leaders (kenkyushitsu shunin taru kenkyuin, research scientists in charge of a research group, or shunin kenkyuin, chief research scientists) could employ research associates and students at their discretion within budgetary limits, and any research with the approval of the administrative board.[97] Salaries did not differ much

[88] Ahmad, Naris. ECONOMIC RESOURCES OF THE UNION OF BURMA. Technical Report. 71-61-ES. Project Reference: Series: 1T061101A9LA07. Series. ES-70. Earth Sciences Laboratory. U. S. Army Natick Laboratories May 1971
[89] Saito Satoshi. Shinko kontserun RIKKEN no kenkyû: Okochi Masatoshi to RIKKEN sangyodan. Tokyo. Jichosha. 1987; Miyata Shimpei, Kagakusha tachi no jiyûna rakuen: Eikono rikagaku kenkyûjo. Tokyo. Bungei Shunjûsha. 1983
[90] Itakura, Kiminobu. Kagaku to shakai: Sozosei wo umu shakai, shiso, soshiki, reprinted. Tokyo. Kisetsusha. 1988
[91] Saito Satoshi. Shinko kontsuerun RIKKEN no kenkyû. Tokyo. Jichosha. 1987. For Ökouchi's own formulation of "scientifist industry," Okouchi Masatoshi. Shihonshugi kogyo to kagakushugi kogyo. Tokyo. Kagakushugikogyosha. 1938
[92] Ito, Kenji. Making Sense of Ryoshiron (Quantum Theory): Introduction of Quantum Mechanics into Japan, 1920-1940. Harvard University. Cambridge, Massachusetts. October 2002
[93] Ito, Kenji. Making Sense of Ryoshiron (Quantum Theory): Introduction of Quantum Mechanics into Japan, 1920-1940. Harvard University. Cambridge, Massachusetts. October 2002
[94] Tokushû: Rikagaku Kenkyûjo 60-nen no ayumi. Shizen, no. 394. December 1978
[95] Nitta Isamu, Nagare no nakani
[96] Ito, Kenji. Making Sense of Ryoshiron (Quantum Theory): Introduction of Quantum Mechanics into Japan, 1920-1940. Harvard University. Cambridge, Massachusetts. October 2002
[97] Ito, Kenji. Making Sense of Ryoshiron (Quantum Theory): Introduction of Quantum Mechanics into Japan, 1920-1940. Harvard University. Cambridge, Massachusetts. October 2002

between the two posts and paid about twice as much as that of an imperial university research associate or a lecturer.[98] One drawback of a junior position at Rikken was job-security – young physicists would not necessarily be promoted to higher positions in Rikken, leading some, such as Tomonaga Shinichiro, to leave Rikken to join other institutions.[99] Since a group leader many times hired more than one (sometimes many) research associate, younger scientists could not always succeed their boss, and most had to eventually leave Rikken anyway. Though Rikken's thermal-diffusion process represents Japan's most well-known wartime uranium enrichment efforts, it was not the only such effort, nor was it the largest such operation within the Empire.

Japan's scientists worked continuously before and during the war on thermal diffusion, gaseous diffusion, electromagnetic isotope separation, centrifuges and so on. Japan installed a pilot scale thermal diffusion scale plant at Osaka Imperial University, and apparently constructed an operational industrial-scale thermal diffusion plant just south of Hungnam, Korea.[100] Japan had several other types of plants either planned or under construction on the Korean peninsula during the war. These were at Chong'jin,[101] Kanggye[102] and Sinanju,[103] leaving a foundation and plans for an eventual North Korea to build upon. Reactors may have also been planned for the areas of Koto-ri on the Changjin Plateau,[104] Chong'jin,[105] and Kanggye.[106]

Unlike the military of that era where operation and training budgets were approved in each term of Japan's Diet, with longer term programs supporting the construction of capital ships, railroads and so on, civilian planning for large-scale scientific projects was regularly conducted years in advance. It is likely that, aware of the huge endeavor at hand, Japanese scientists would have planned for the acquisition of uranium ore anywhere it became available as Japan expanded its Empire into East Asia, as in fact they did. Japan is known to have mined uranium-bearing ores in China, Korea, and Manchukuo, and captured as war booty such ores in Malaya and transported them to Japan. It is unrealistic to believe that Japan was combing vast areas entire empire for previously unknown sources of uranium, locating and mining for such ores in China, Korea and Manchukuo, and yet would ignore previously identified sources in Burma. As Japan's scientists were operating under the idea that such a large program would take about ten years, and that the Japanese program began in 1939 at the latest (possibly as early as 1936), it is no small wonder that rumors of the test of such a weapon off the coast of northern Korea in August 1945 spread immediately after the event over Hiroshima on the 6th of that month.[107] Nagaoka's comments, however, were never prescient – simply accurate.

At Tokyo Imperial University, Nagaoka was the dominating figure in the physics department of the 1920's. By himself, he alone produced more than half the department's publications. Though he probably never intended to be authoritarian, Nagaoka was nicknamed "the Thunderer" (kaminari oyaji) – he was strict, outspoken, and short-tempered.[108] His harsh and critical remarks intimidated young physicists and suppressed freer discussion in the physics department. At colloquia, Nagaoka always sat just in front of the speaker and dominated the presentation by bombarding the person presenting their ideas or papers with questions. His presence so frightened some undergraduate students that during one such session a speaker fainted.[109]

Iimori Satoyasu, Chief of Riken's Iimori Radio-Chemistry Laboratory, and known to have been involved with Japan's prewar and wartime search for uranium-bearing ores across East Asia, directly managed the Imperial Japanese Army's search for uranium in Manchuria.[110] Iimori also managed the search for uranium in Southeast Asia through the work of a subordinate, Tanikawa Hiroshi. Tanikawa served as a civilian geologist under the Imperial Japanese Army holding the simulated rank of brigadier general.[111] Tanikawa had been part of Japan's "science trip," *The National Resources Investigation Party to the Southern Regions* (*Nampa kagaku kiko*), an early 1942 survey to examine in-depth the natural resources of Japan's newly acquired South Seas Area.[112] The survey included an examination of the area's mineral wealth, which would have included uranium, thorium and monazite.

Led by former Japanese Imperial Army Lieutenant General Tada Reikeichi, Japan's 1942 survey of its newly acquired territories extended into Burma, Indochina, Indonesia, Malay Peninsula, and the Philippines.[113] If not involved with Japan's atomic energy and weapons research before the 1942 survey itself, Tada would be solidly associated with the program later that year as he searched

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[98] Ito, Kenji. Making Sense of Ryoshiron (Quantum Theory): Introduction of Quantum Mechanics into Japan, 1920-1940. Harvard University. Cambridge, Massachusetts. October 2002

[99] Ito, Kenji. Making Sense of Ryoshiron (Quantum Theory): Introduction of Quantum Mechanics into Japan, 1920-1940. Harvard University. Cambridge, Massachusetts. October 2002

[100] Stanley Sandler. World War II in the Pacific: An Encyclopedia (Military History of the United States) 1st Edition. Taylor & Francis, New York. 2001

[101] Thompson, Robert Smith. Empires on the Pacific: World War II and the Struggle for Mastery of Asia. Basic Books. 2001

[102] 1950 (5 November). Message to CG FAF and CG FEAF Bomcom: Destruction of North Korea

[103] Irrigation Works, Pyongan Namdo. KMAG Liaison Office. Confidential Informant. North Korea. 10 December 1949

[104] Rider, Dwight R. Burn before Reading: The Japanese Atomic Bomb Program, the Battles of the Chosin Reservoir, and the Cave at Koto-ri. The Cell. 21 March 2017. http://www. mansell. com/Resources/Rider_Burn_Before_Reading 28May2016.pdf

[105] Thompson, Robert Smith. Empires on the Pacific: World War II and the Struggle for Mastery of Asia. Basic Books. 2001

[106] 1950 (5 November). Message to CG FAF and CG FEAF Bomcom: Destruction of North Korea

[107] Snell, David. Japan Developed Atom Bomb; Russia Grabbed Scientists. Constitution. Atlanta, Georgia. 3 Oct 1946

[108] Itakura, Kiyonobu. Nagaoka Hantaro. Tokyo. Asahi Shimbunsha. 1976

[109] Suzuki Akira. "Omoide no ki," in Nihon no butsurigakushi, edited by Nihon Butsrugakkai. Tokyo. Tokai Daigaku Shuppankai. 1978

[110] Culver, Annika A. Media, Propaganda and Politics in 20th-Century Japan by Asahi Shimbun Company (review). The Journal of Japanese Studies. Society for Japanese Studies. Volume 42, Number 2, Summer 2016

[111] Occurrence of Radioactive Minerals in Former Japanese Controlled Areas. Department of the Army (Strategic) Intelligence Division. 7 October 1948. Record Group 331. Stack Area 290. Row 24 Compartment 2. Shelf 1. Entry 224. Box 2. The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD

[112] Nish, Ian. The Japanese in War and Peace, 1942-48: Selected Documents from a Translator's In-Tray. London School of Economics and Political Science. Global Oriental. 2011

[113] Sasaki, Chikara. In Memorium Hirosige Tetsu. Science and the Japanese Empire 1868–1945: An Overview. https://link. springer. com/chapter/10. 1007%2F978-94-011-2594-9_25

Manchuria on horseback for uranium. As a subsequent President of Japan's Cabinet Board of Technology, Tada Reikeichi would one day control all funding of the various parts and programs that eventually made up Japan's overall bomb program.[114] Postwar, Tada would oversee the transfer of ownership of Japan's uranium-bearing ores to the United States.

Tanikawa Hiroshi's efforts were dedicated solely to prospecting for rare elements in Borneo, Burma, Celebes, China, French Indochina, Japan, Korea, and the Malay Peninsula.[115] As for Burma, Tanikawa's postwar report specifically pointed to the area of Mogok[116] as a source of rare elements.[117] Radioactive materials had been identified in Burma as early as 1906, however numerous reports would first talk widely about the presence of uranium as early as 1948, after the event over Hiroshima.[118] The Myanmar Ministry of Energy lists five areas, mainly near Mogok, as having the potential for uranium mining. Of course, in 1942, the Imperial Japanese Army controlled Mogok and northern Burma. Nishina Yoshio, the Chief of Theoretical Physics for Japan's various atomic energy and weapons research programs, and the leader of Riken's Nishina Laboratory, along with Iimori also knew there were substantial deposits of uranium ore in areas outside Japan Proper in Burma, the Belgian Congo and Czechoslovakia.[119] In fact, the Japanese Army's initial response at hearing how much ore Japan needed, sought to import uranium from the Belgian Congo, an effort agents of the United States quietly obstructed even though the Belgian Congo was neutral.[120]

During the war, the Imperial Japanese Army, with Iimori's assistance, is known to have imported about 3,000 - 5,000 tons of monazite from the Malay Peninsula.[121] Interestingly, Iimori's laboratory actually increased the production rate of its monazite refinery from 700 tons monthly in October 1943 to 6,150 tons monthly in March 1944.[122]

At a 1943 Japanese army re-briefing of the materials assembled in 1938, Nishina Yoshio relied partly on that same information to say that uranium deposits were already known to exist in China, Korea and in Daitoa Kyoeikan (the Greater East Asia Co-Prosperity Sphere) as Nagaoka had suggested earlier. The Greater East Asia Co-Prosperity Sphere included all of French Indochina, the Netherland East Indies, Burma, Borneo, the Philippine Islands, etc.[123] For Japan's zaibatsu, this meant there was money to be made and responsibilities to be avoided.

With the capture of Burma, the challenge was no longer in locating the required ores, possibly not even in mining the ore itself, but in transporting mine spoils to Greater Japan, which included Korea. In this area, Mitsui and Mitsubishi excelled. As Japan's army moved forward, transports owned by Mitsui and Mitsubishi followed close behind.

According to documents submitted to the Scientific and Technical Division by the Japanese Chief of the Mining Bureau of Commerce and Industry: "During 1942-1945, black sand and rare element ores were purchased by Mitsubishi Shoji K. K. Mitsui Bussan K. K. and Showa Tsusho K. K., and were delivered to the Japanese Southern Army."[124] The document then discusses Korean monazite, then states that: "The Southern Army shipped the above ores to Japan by military boats, the actual business of the shipment being carried out by Mitsubishi Shoji K. K."[125] The document continues: "After importing to Japan, the ores were sold to Kigenso Tosei Kumiai, which distributed them to consumers according to the instructions of the Ministry of minitions [sic] (Munitions), actual transaction being carried out by Mitsubishi Shoji K. K."[126] Interestingly, Mitsubishi Shoji K. K. also carried all monazite mined in Korea to Japan.[127] Altogether, according to postwar intelligence, a total amount of 4,494.7 tons of rare-element ores were shipped to Japan

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[114] Petitjean, P. Catherine Jami and A. M. Moulin. Science and Empires: Historical Studies about Scientific Development and European Expansion. Springer Science & Business Media. 6 December 2012

[115] Occurrence of Radioactive Minerals in Former Japanese Controlled Areas. Department of the Army (Strategic) Intelligence Division. 7 October 1948. Record Group 331. Stack Area 290. Row 24 Compartment 2. Shelf 1. Entry 224. Box 2. The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD

[116] Solomon, Feliz. Welcome to Mogok, Myanmar's mysterious mining mecca. Myanmar's miners have been left with little more than scraps following years of military plunder. 29 December 29, 2016

[117] Occurrence of Radioactive Minerals in Former Japanese Controlled Areas. Department of the Army (Strategic) Intelligence Division. 7 October 1948. Record Group 331. Stack Area 290. Row 24 Compartment 2. Shelf 1. Entry 224. Box 2. The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD

[118] Engineering and Mining Journal. Monazite [in Trengganu]: v. 81, No. 12. 1906: Burma has radioactive minerals. V. 149, no. 10. 1948

[119] Uranium Project Research Meetings at the Nishina Research Laboratory and the 2nd Tokyo Army Arsenal. Background: Concerning Uranium. Tonizo Laboratory: Shyowa 18 Nen – April 1943. Five sections, dated: 2 July 1943, 6 July 1943, 2 Feb 1944 and 17 Nov 1944. In Japanese. Obtained from the Riken Nishina Center for Accelerator-Based Science in 2006. Translation: Dwight R. Rider, Dr. Eric Hehl and Wes Injerd. April 2017

[120] The Pacific War Research Society. The Day Man Lost: Hiroshima, 6 August 1945. Kodansha International. Tokyo, Japan. 1981

[121] "Field Progress Report No. 4 – Group 1," (September 28, 1945) from SCAP: Economic and Scientific Section, Atomic Bomb Mission Japan: Final Report, Scientific & Mineralogical Investigation

[122] Pegumataito no Kioku, 69

[123] Uranium Project Research Meetings at the Nishina Research Laboratory and the 2nd Tokyo Army Arsenal. Background: Concerning Uranium. Tonizo Laboratory: Shyowa 18 Nen – April 1943. Five sections, dated: 2 July 1943, 6 July 1943, 2 Feb 1944 and 17 Nov 1944. In Japanese. Obtained from the Riken Nishina Center for Accelerator-Based Science in 2006. Translation: Dwight R. Rider, Dr. Eric Hehl and Wes Injerd. April 2017

[124] Subject: Answer Regarding the Rare Element Ore. To: Mr. W. J. Allen. Science of [sic] Technical Division. ESS, GHQ. 23, Ko No. 1942. 28 April 1948. Record Group 331. Stack Area 290. Row 24 Compartment 2. Shelf 1. Entry 224. Box 1. The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD

[125] Subject: Answer Regarding the Rare Element Ore. To: Mr. W. J. Allen. Science of [sic] Technical Division. ESS, GHQ. 23, Ko No. 1942. 28 April 1948. Record Group 331. Stack Area 290. Row 24 Compartment 2. Shelf 1. Entry 224. Box 1. The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD

[126] Subject: Answer Regarding the Rare Element Ore. To: Mr. W. J. Allen. Science of [sic] Technical Division. ESS, GHQ. 23, Ko No. 1942. 28 April 1948. Record Group 331. Stack Area 290. Row 24 Compartment 2. Shelf 1. Entry 224. Box 1. The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD

[127] Memo for Files: Subject: Interview with Mr. Ryukochi Naka of the NIPPON KIGENSO TOSEI KUMIAI Seisan Jimusho (Liquidation office of the Nippon Rare Element Control Association). 22 May 1946. Bibliographic ID (link to National Diet Library Online) digidepo_9898582.pdf

during the war from Korea and the southern area (Southeast Asia).[128] No one knows for sure, though – from 1943 on, all necessary paperwork and negotiations for all imports during the war were handled by the Koeki Eidan.

The Koeki Eidan

The Koeki Eidan was established on July 1943 for the purpose of taking over the functions of the Essential Materials Supervision Corporation, and in addition, to handle all shipments of pretty much anything into and out of Japan. When created, the Koeki Eidan was capitalized at 300,000,000 yen. The government provided 90% of initial funding with the remaining 10% supplied by the large trading companies such as Mitsubishi, Mitsui and others.[129] The agency had authority over the stockpiling of raw materials and the duty of purchasing materials coming into Japan as well as the handling of goods for export.[130] The Japan Rare Earth Control Association (Nippon Kigenso Toeshi Kumiai) worked through the Koeki Eidan in importing foreign (excluding Korea) ores. Mitsubishi Shoji handled all transportation from the mines to the seaport and from the Japanese seaport to member firms of the association. The Koeki Eidan itself arranged all ocean transport.[131] Postwar, SCAP dissolved and eliminated the Koeki Eidan through SCAP Instruction 815 and confiscated all property in its possession, to include diamonds.[132] Oddly enough, the Japan Rare Earth Control Association, which the Koeki Eidan served, was not created until the following October.

The Japan Rare Earth Control Association was organized in October 1943. It was funded by its 46 member firms to expedite the importation and distribution of rare-earth-bearing ores, particularly monazite, to Japan.[133] According to Nakaya Ryukichi, the monazite-bearing ores and sand were imported from Korea and Malaya.[134] Technically this was true; in 1943, the Southern Army was headquartered in Singapore, as was the Commanding Officer 3rd Shipping Transport Command. There was no shipping transport headquarters located inside Burma. Ore dressing to 90% monazite was accomplished in Japan at one of three locations:[135]

Osaka Seirenjo of the Mitsubishi Kogyo K. K
Riken Arakawa Kojo
Inasa-Kojo of the Rare Earth Control Association

1942 - Shipping Ores

The Japanese began shipping uranium-bearing ores and mine tailings from Southeast Asia (particularly well-documented from Malaya) to Japan for refining in 1942. In the Netherlands East Indies, the Mitsui *zaibatsu* conducted operations mainly in the western part of the archipelago, whereas Mitsubishi handled the eastern part.[136] Mitsubishi took charge of the tin mines in Bangka and Belitung.[137] Below the surface, tin was significant.

Most of the tin deposits in Malaya were found on the western side of the Malaya Peninsula. The two largest Malayan deposits lay in the Kinta Valley and the area surrounding Kuala Lampur. Cassiterite, the major ore containing tin, was recovered by surface mining. The cassiterite was located in alluvium derived from granites and placer deposits.[138] The most common heavy minerals found in this alluvium were ilmenite, zircon, xenotime and tourmaline.[139] The amounts of cassiterite and monazite were less common but remained economically valuable. Other ores such as leucoxene, topaz, anatase, magnetite, limonite, hematite and corundum were also present.[140]

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[128] Subject: Answer Regarding the Rare Element Ore. To: Mr. W. J. Allen. Science of [sic] Technical Division. ESS, GHQ. 23, Ko No. 1942. 28 April 1948. Record Group 331. Stack Area 290. Row 24 Compartment 2. Shelf 1. Entry 224. Box 1. The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD

[129] Subject: Coal Imports and the Koeki Eidan. Interrogation No. 248. Place: Tokyo. Date: 5 November 1945. Time: 0930. Bibliographic ID (link to National Diet Library Online) digidepo_4012497.pdf

[130] SCAPIN-815: DISSOLUTION OF KOEKI-EIDAN AND NIPPON ZAKKA BOEKI SHINKO KAISHA. AG 323. 31 (14 Mar 46) ESS/AC (SCAPIN-815). APO 500. 14 March 1946. MEMORANDUM FOR: IMPERIAL JAPANESE GOVERNMENT. THROUGH: Central Liaison Office, Tokyo. Subject: Dissolution of Koeki Eidan and Nippon Zakka Boeki Shinko Kaisha. MEMO FOR RECORD: (SCAPIN-815). 6 March 1946

[131] Memo for File. Subject: Interview with Mr. Ryukichi Nakaya of the Japan Rare Earth Control Association. (Nippon Kigenso Tosei Kumiai). 31 May 1946. Bibliographic ID (link to National Diet Library Online) 000006846573

[132] Subject: Dissolution of Koeki Eidan and Nippon Zakka Boeki Shinko Kaisha. AG 323. 31 (14 Mar 46) ESS/AC. (SCAPIN -815) 14 March 1946. Bibliographic ID (link to National Diet Library Online) digidepo_9885890.pdf

[133] Memo for Files. Subject: Interview with Mr. Ryukichi Nakaya of the Nippon Kigenso Toeshi Kumiai Seisan Jimusho (Liquidation office of the Nippon Rare Earth Control Association) 22 May 1946. Bibliographic ID (link to National Diet Library Online) 000006846573

[134] Memo for Files. Subject: Interview with Mr. Ryukichi Nakaya of the Nippon Kigenso Toeshi Kumiai Seisan Jimusho (Liquidation office of the Nippon Rare Earth Control Association) 22 May 1946. Bibliographic ID (link to National Diet Library Online) 000006846573

[135] Memo for Files. Subject: Interview with Mr. Ryukichi Nakaya of the Nippon Kigenso Toeshi Kumiai Seisan Jimusho (Liquidation office of the Nippon Rare Earth Control Association) 22 May 1946. Bibliographic ID (link to National Diet Library Online) 000006846573

[136] Lieberman, V. and M. C. Ricklefs. The Encyclopedia of Indonesia in the Pacific War. Handbook of Oriental Studies. SECTION THREE. Southeast Asia. VOLUME 19

[137] Hikita, Y. "Japanese companies" inroads into Indonesia under Japanese military domination', in Post/Touwen-Bouwsma, Japan, Indonesia and the War, pp. 160–1

[138] Roberts, P. D. Radiometric Measurements, Soil and Water Sampling in Tin Mining Areas of Malaysia. A report prepared for the Overseas Development Administration under the ODA/BGS Technology Development and Research Programme, Project 93/8. BGS Technical Report WC/95/82/. British Geological Survey. 1995

[139] Roberts, P. D. Radiometric Measurements, Soil and Water Sampling in Tin Mining Areas of Malaysia. A report prepared for the Overseas Development Administration under the ODA/BGS Technology Development and Research Programme, Project 93/8. BGS Technical Report WC/95/82/. British Geological Survey. 1995

[140] Roberts, P. D. Radiometric Measurements, Soil and Water Sampling in Tin Mining Areas of Malaysia. A report prepared for the Overseas Development Administration under the ODA/BGS Technology Development and Research Programme, Project 93/8. BGS Technical Report WC/95/82/. British Geological Survey. 1995

Cassiterite was recovered at that time by dredging or excavation. The removed ore was then washed through a separating system such as a sluice. Sometimes the cassiterite was removed by further separation processes closer to the point of mining with the wastage, the sludge or spoil, left in-place.[141] This spoil was known locally as *amang*, and it was this *amang* that was shipped to Japan.[142] In fact, so much *amang* was shipped to Japan from Malaya and other areas of the Greater East Asia Co-Prosperity Sphere that the word *amang* itself became absorbed into the everyday Japanese language. *Amang* was highly radioactive.[143] The radioactivity found within in the *amang* was caused by the presence within the spoil of xenotime, zircon, and monazite – which in-turn contained thorium-232 and uranium-238.[144] The U_{238} carried the U_{235}. Other than the weight of the materials transported on the rail, there is little factual information to support the claim that Japan built the line to support its army forward deployed in Burma. The weight of ore or preexisting mine tailings shipped out of Burma to Japan, could however justify the construction of a rail.

This *amang* in Malaysia was owned by the military government of Japan, primarily the Imperial Japanese Army. After Malaya was occupied the Imperial Japanese Army had confiscated the *amang* as – war booty.[145] Shipped to Japan, a large amount of this material was held at Inasa Factory of the Mitsubishi Mining Company's Osaka Refinery and the Riken Nosen Company's Arakawa facility.[146] Mitsubishi's Inasa Factory alone was estimated to hold between 448,949 and 714,452 kilograms of *amang*.[147] Another 1,410,472 kilograms were held in another 14 facilities in the suburbs and outlying areas of Osaka and Tokyo.[148] Postwar Tada Reikeichi would serve as the liquidator of all such ore in Japan shipping it all to the US.[149]

Confiscation

On 15 December 1945, a directive (WX-88780) was sent to the Supreme Commander for the Allied Powers (SCAP) ordering the confiscation in Japan of all thorium and uranium bearing ores.[150] Radio directive W845516 to the Commanding General, Eighth Army, stated that, "the Atomic Energy Commission and the State Department had determined that these radioactive stockpiles were, in so many words, 'war booty,' subject to confiscation by the United States and that no payment was to be made to the Japanese by the Atomic Energy Commission."[151] Payment, however, was eventually made.[152] Postwar, US investigators were told in every case by the Japanese owners investigated that such large amounts of *amang* were imported for its thorium content to produce lighter flints. Most of the Japanese ore stockpiles were later judged to be monazite, but of low uranium content, posing the question – where did the uranium in the ores go? On 3 September 1948, the SS Resolute carried 44,431 pounds of "Chemicals NOIBN" and 2,369,023 pounds of confiscated radioactive "sand" to the New York Port of entry, to be stored in a "United States Gov't Warehouse, Middlesex, N.J."[153]

Technically, according to the General Headquarters SCAP, the "Monazite will be listed in shipping documents as 'Sand, Group 22;' *amang* will be listed in shipping documents as 'Sand Group 25;' remaining chemicals will be listed in shipping documents as 'chemicals Noibn (Not Otherwise Identified by Name)."[154] Noibn was a convenient way to avoid specifically identifying the chemical and other materials created by Japan's atomic energy and weapons research program, confiscated by the United States. These

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[141] Roberts, P. D. Radiometric Measurements, Soil and Water Sampling in Tin Mining Areas of Malaysia. A report prepared for the Overseas Development Administration under the ODA/BGS Technology Development and Research Programme, Project 93/8. BGS Technical Report WC/95/82/. British Geological Survey. 1995

[142] Roberts, P. D. Radiometric Measurements, Soil and Water Sampling in Tin Mining Areas of Malaysia. A report prepared for the Overseas Development Administration under the ODA/BGS Technology Development and Research Programme, Project 93/8. BGS Technical Report WC/95/82/. British Geological Survey. 1995

[143] Roberts, P. D. Radiometric Measurements, Soil and Water Sampling in Tin Mining Areas of Malaysia. A report prepared for the Overseas Development Administration under the ODA/BGS Technology Development and Research Programme, Project 93/8. BGS Technical Report WC/95/82/. British Geological Survey. 1995

[144] Roberts, P. D. Radiometric Measurements, Soil and Water Sampling in Tin Mining Areas of Malaysia. A report prepared for the Overseas Development Administration under the ODA/BGS Technology Development and Research Programme, Project 93/8. BGS Technical Report WC/95/82/. British Geological Survey. 1995

[145] Mr. G. Yamashiro. Science and Technical Division. Economic and Scientific Section (ESS). Supreme Commander for the Allied Powers (SCAP). Tokyo. 4 November 1948. Record Group 331. Stack Area 290. Row 24 Compartment 2. Shelf 1. Entry 224. Box 6. The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD

[146] Mr. G. Yamashiro. Science and Technical Division. Economic and Scientific Section (ESS). GHQ, Supreme Commander for the Allied Powers (SCAP). Tokyo. 27 September 1948. Record Group 331. Stack Area 290. Row 24 Compartment 2. Shelf 1. Entry 224. Box 6. The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD

[147] Surveillance of Special Projects. Target Name: Mitsubishi Kogyo K. K. (Mitsubishi Mining Co., Ltd) 19 March 1949. Record Group 331. Stack Area 290. Row 24 Compartment 2. Shelf 1-2. Entry 224. Box 8. The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD; Record Group 331. Stack Area 290. Row 24 Compartment 2. Shelf 1. Entry 224. Box 2. The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD

[148] Uranium and Thorium. Commanding General. Eighth Army. 9 Jun 1949. Record Group 331. Stack Area 290. Row 24 Compartment 2. Shelf 1. Entry 224. Box 6. The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD

[149] Translation of Request to Sell – Submitted 20 June 1947. Request for Permission to sell Crude Monazite Ores. 20 June 1947. Bibliographic ID (link to National Diet Library Online) 000006846573

[150] Memo for Record. Subject: Impoundment of Radioactive Stockpiles in Japan – Summary of Events. 23 July 1948. Record Group 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

[151] Memo for Record. Subject: Impoundment of Radioactive Stockpiles in Japan – Summary of Events. 23 July 1948. Record Group 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

[152] Memo for Dr. H. C. Kelly. 4 September 1848. Record Group 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

[153] Army Ocean Manifest. Vessel: Resolute. From: Yokohama. To: New York POE. Loaded at: South Pier. Date: 2 Sept 1948/ Class: Chemical. Page: 1. Record Group 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

[154] Subject: Uranium and Thorium. AG 410. 42(17 August 48) ESS/SFU. 17 August 1948. Record Group 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

materials would have contained a high amount of uranium held in a dry state from some level of previous precipitation, to include yellowcake, uranium and thorium metals, highly enriched uranium, and possibly Japan's wartime nuclear wastes. Fourteen of the now consolidated spoil piles, the largest known monazite stockpiles on Honshu, were never shipped to the US.[155] They were too low in uranium content to be useful to the continuing Manhattan Project.

Economic infiltration of Burma

When war began, the economic infrastructure of Burma primarily supported trade with India and the British Empire to the west, not eastward into Thailand and then Japan. Burma lacked the necessary infrastructure to support large-scale trade with Thailand, Malaysia and Singapore, making transport of materials from Burma to the east a difficult proposition reliant primarily on surface transport by ship. In February 1943, with the Japanese merchant fleet being decimated by US submarines, the Japanese Army created a new command, the Thailand Garrison Army under Lt. Gen Nakamura Aketo. Regional economic self-sufficiency now became a necessity. Thailand would be used to its maximum capacity as a supply base for Japanese forces in Burma.[156]

Korea and large sections of China were already economically integrated into the Japanese Empire. Korea, part of Greater Japan since its annexation in 1909, possessed the necessary infrastructure in 1940 to allow for the transportation of any uranium-bearing ores identified in Manchuria or on the Korean Peninsula to Japan. Some places in China, such as Shanghai which also falls into this narrative, had been under Japanese control since November 1937. In January 1945 the Imperial Japanese Naval Technical Department had used Shanghai as a cutout in the purchase of uranyl oxide (U_3O_8) for use in an experiment on atomic power.[157] The construction of Thai-Burma Railway was demanded not so much to support Japanese military expansion into India but to aid the integration of the Burmese economy into the Greater East Asia Co-Prosperity Sphere, however this was not an all-consuming interest and was rarely discussed after the war. Mining the ores was one thing, transporting them eastward to Japan was another.

In Burma, Mitsui-Bussan, Mitsubishi-Shoji and Nihon-Menka seem to have had the closest relations with the army. Across Southeast Asia, however, Mitsubishi and Mitsui fought a trade war with each other for local dominance, primarily shipping rights. Ultimately however, the Japanese Army was always in control.[158] Rights or not, smuggling was also a method used to transport teak wood, gems, and other precious cargo out of Burma.[159] More nebulous companies followed the trails of the larger *zaibatsu*.

The *zaibatsu* of Mitsui and Mitsubishi ran operations connected to the uranium program chiefly through smaller front companies such as the *Hokkaido and Steamship Co*, a subsidiary of Mitsui.[160] *Ataka Sangyo K.K.* established a branch in Burma on 7 April 1942, operating mines in the Yamethin area. *Mitsubishi Kogyo K.K.* officially opened offices in Burma that same day. Mitsubishi took ownership of the mines in the Tavoy area and for a time temporarily operated the Mawson Mines.[161] *Kobayashi Mining K.K.* opened a branch office in Burma on 10 July 1942 to operate the Mawchi Wolfram Mine.[162] In 1944, these companies were joined by additional mining concerns such as *Aoyagi Steel K.K.*, *Iwaki Cement K.K.*, *Meiji Mining K.K.*, *Chuou Boseki Corporation*, *Gosho KK.*, and *Nichinan Sangyo*, *Hokuetsu Paper K.K.* and *Fuji Gas & Spinning K.K.*, whose interests in mining were always secondary to other enterprises, but they were in Burma.[163]

These companies in turn developed cottage industries in Burma and Thailand to collect materials and mine smaller areas for more specialized materials such as rare ores.[164] The Japanese Embassy in Bangkok itself convinced the Chinese Chamber of Commerce to establish a joint stock company, the Manho Yogen Koshi – Wan Feng Company – to supply gravel and other materials for the construction of the Thai-Burma Railway.[165] Mitsubishi, opposed to the involvement of a Chinese company, objected. In the end, the Imperial Japanese Army settled the dispute by more equitably dividing up delivery and transport areas. The Manho Yogen Koshi also transported rice up and down the Malay Peninsula.[166] For a wartime area where transportation was recorded by history as being at a standstill, things seem to have moved when the Japanese Army wanted.

Running nearly in tandem with the US Manhattan Project through 1942, Japanese requirements for large amounts of uranium-bearing ores to be on hand for processing would have begun in Japan around late 1942 early 1943, at approximately the same point as Oak Ridge, Tennessee. The ores would begin arriving in Japan, as in the US, when the necessary science and engineering involved in

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[155] Subject: Uranium and Thorium. AG 410. 42(17 August 48) ESS/SFU. 17 August 1948. Record Group 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

[156] Reynolds. Bruce E. International Orphans': The Chinese in Thailand During World War II. Journal of Southeast Asian Studies. 1997

[157] Subject: Surveillance of Special Projects. General Headquarters. Far East Command. Military Intelligence Section. Technical Intelligence Detachment. 1 September 1947. Record Group 331. Stack Area 290. Row 24 Compartment 2. Shelf 1-2. Entry 224. Box 5. The US National Archives and Records Administration, 8601 Adelphi Road, College Park, MD

[158] ARTHUR W. HUMMEL JR. Ambassador. Burma (1968-1971). BURMA. COUNTRY READER. Interviewed by Charles Stuart Kennedy. 6 June 1989

[159] MARTIN, EDWIN WEBB. Consular Officer. Rangoon (1950-1951). BURMA. COUNTRY READER. Interviewed by Charles Stuart Kennedy. 6 June 1989

[160] Lieberman, V. and M. C. Ricklefs. The Encyclopedia of Indonesia in the Pacific War. Handbook of Oriental Studies. SECTION THREE. Southeast Asia. VOLUME 19

[161] Trager, F.N. (ed.), Burma: Japanese Military Administration, Selected Documents, 1941–1945, Philadelphia: University of Pennsylvania Press, 1971

[162] Trager, F.N. (ed.), Burma: Japanese Military Administration, Selected Documents, 1941–1945, Philadelphia: University of Pennsylvania Press, 1971

[163] Boei cho/Boei kenkyujo/Senshi bu, Shiryoshu Nampo no Gunsei, p. 206

[164] Ahmad, Naris. ECONOMIC RESOURCES OF THE UNION OF BURMA. Technical Report. 71-61-ES. Project Reference: Series: 1T061101A9LA07. Series. ES-70. Earth Sciences Laboratory. U. S. Army Natick Laboratories May 1971

[165] Boggett, David. Notes on the Thai-Burma Railway. Thai Labour & the Ban Pong Incident. Journal of Kyoto Seika University. Number 26

[166] Reynolds. Bruce E. International Orphans': The Chinese in Thailand During World War II. Journal of Southeast Asian Studies. 1997

developing a production-level uranium enrichment process began to come on-line; accounting for the large amounts of radioactive materials bearing ores located throughout Japan by US military forces in 1945 and 1946.[167]

> *To get the job done, the Japanese had mainly human flesh for tools, but flesh was cheap. Later there was an even more plentiful supply of native flesh – Burmese, Thais, Malays, Chinese, Tamils and Javanese ..., all beaten, starved, overworked and, when broken, thrown carelessly on that human rubbish-heap, the Railway of Death.*
>
> -Ernest Gordon, former British POW, in his book, "Miracle on the River Kwai" (Collins, 1963)

The Thai-Burma Railway and the Battle of Midway

Academic historians argue that the Japanese built the rail line to supply their forces in Burma, ordering its construction after the Japanese defeat at the Battle of Midway. The loss of four aircraft carriers at Midway decreased the Imperial Japanese Navy's ability to defend merchant shipping from Singapore to Rangoon through the Bay of Bengal and the Andaman Sea. Japan's aircraft carriers had never operated in those areas – nor would they. The Imperial Japanese Navy's Carrier Division only ventured into the Indian Ocean itself once, from 26 March 1942 through 10 April, under *Operation C*.

As a good road network across the border mountains did not exist, the Japanese army initially built a single-lane unpaved road to advance into Burma, but it could not be used in the rainy season and had limited capacity. Since the construction costs of a good paved road were equal to that of a railway, and the Japanese did not have enough lorries (trucks) to move large amounts of supplies to Burma, a Burma–Thailand railway was judged to be the best choice. The justification given was however, not entirely true.[168]

The Japanese Imperial Army had included the development of such a line in its war planning prior to 1939. The route would shorten the Japanese line of communications by almost 1,000 kilometers as, at that time, all supplies into Burma would have to be shipped around the Malay Peninsula.[169] The Imperial Japanese Army had produced a photomosaic of the entire route in early 1939. They conducted a feasibility study of the route from 1939 to 1940.[170] The Japanese had been secretly negotiating with the government of Thailand for the construction of new railways in early 1942 long before the battle of Midway. Lieutenant Colonel Iwayashi, Director of Transportation of the Japanese Army, had been dispatched from Tokyo before the Japanese naval defeat at Midway to Bangkok to handle those negotiations.[171] On 23 March 1942, months before the battle, he presented to the Thai government a "Draft Thailand-Japan Agreement on the Construction of the Thai-Burma Railway."[172] The Battle of Midway lay three months ahead, in a future that no one could foresee.

Shortly after the construction work of the Thai-Burma Railway began, the Japanese Army headquarters in Tokyo sent General Yamada, a military envoy, to Thailand. On 13 May 1943, he secretly presented a draft agreement on the Kra Canal Railway or Chumphon-Kraburi Railway.[173] The Battle of Midway was at that time, three weeks into the future. The Thai government was forced to respond instantly.[174]

The Thai government was given little time to consider the agreement carefully. On 16 September 1942, the agreement was signed by Field Marshal Phibun, Thailand's Prime Minister and Supreme Commander, and General Seji Moriya, representative of the Japanese Army in Thailand. Ultimately the agreement provided the Japanese with right-of-way to the land required to support the line with Thailand subsidizing some of the costs involved, and supplying some of the labor required to complete the easiest part of the rail between Ban Pong and Kanchanaburi.[175] The Japanese received permission from the Thai government for the construction of the railway on the condition that the portion between Nong Pladuk and Kanchanaburi (51 km) should be the property of the Thai national railway company (RSR).[176] That portion of the railway was urgently constructed by the 9th Railway Regiment as Kanchanaburi was to serve as the main supply position for their construction work from Thailand into Burma.[177]

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[167] Space Chartered: Army Ocean Manifest. Vessel: Resolute (U. S Lines) Destination: New York. Date. 4 September 1948. Record Group 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

[168] Tamayama, Kazuo. Railwaymen in the War. Tales by Japanese Railway Soldiers in Burma and Thailand 1941–47. PALGRAVE MACMILLAN. New York. 2005

[169] Tamayama, Kazuo. Railwaymen in the War. Tales by Japanese Railway Soldiers in Burma and Thailand 1941–47. PALGRAVE MACMILLAN. New York. 2005

[170] Futamatsu, Yoshihiko. Across the Three Pagodas Pass, The Story of the Thai-Burma Railway. Renaissance Books. Ket, England. 2013

[171] Kiattisahakul, Puengthip. Assistant Professor, Faculty of Arts, Silpakorn University. Part Three: Economic and Cultural Issues. The Japanese Army and the Control of Southern Thai Railways, 1941-1945

[172] Kiattisahakul, Puengthip. Assistant Professor, Faculty of Arts, Silpakorn University. Part Three: Economic and Cultural Issues. The Japanese Army and the Control of Southern Thai Railways, 1941-1945

[173] Kiattisahakul, Puengthip. Assistant Professor, Faculty of Arts, Silpakorn University. Part Three: Economic and Cultural Issues. The Japanese Army and the Control of Southern Thai Railways, 1941-1945

[174] Kiattisahakul, Puengthip. Assistant Professor, Faculty of Arts, Silpakorn University. Part Three: Economic and Cultural Issues. The Japanese Army and the Control of Southern Thai Railways, 1941-1945

[175] Boggett, David. Notes on the Thai-Burma Railway. Part VIII Thai Labour and the Ban Pong Incident. Death Railway Organization. Journal of Kyoto Seika University. No. 26. http://www. deathrailway. org/wp-content/uploads/2015/11/Part-8-Thai-Labour-The-Ban-Pong-Incident-1.pdf

[176] Kiattisahakul, Puengthip. Assistant Professor, Faculty of Arts, Silpakorn University. Part Three: Economic and Cultural Issues. The Japanese Army and the Control of Southern Thai Railways, 1941-1945

[177] Tamayama, Kazuo. Railwaymen in the War. Tales by Japanese Railway Soldiers in Burma and Thailand 1941–47. PALGRAVE MACMILLAN. New York. 2005

Behind the scenes, Thai authorities seriously doubted if the Japanese could successfully build the rail line. However, the Japanese were well-educated, many at western schools, and among them were specialists in constructing railways in hilly country, since hilly terrain is ever-present in Japan. The biggest problem for the Japanese army was not whether they could build the railway, but rather whether they could build it in time with the resources available to support their advance into India.[178] The demands of a war and the demands of a wartime bomb program are so intrinsically similar that a bomb program can hide within a conflict. Only intense research can reveal its presence. Any effort required for a nation other than an industrially rich country to build a bomb would look to those outside the country – much like a war, just like Pakistan, and much later, just like North Korea. Pyongyang has been on a war-footing since 1948.

The Thai government took responsibility for clearing the right-of-way from Nong Pladuk to Kanchanburi.[179] The Japanese tasked the Thai government with supplying food, light equipment (such as hoes, shovels, axes, rock crushers et cetera) and with recruiting personnel, such as technicians, carpenters, divers, Thai and Thai-Chinese labor.[180] On the Burmese side of the border, the Japanese-run puppet government forcibly recruited into the *Chwe Tat* or "Sweat Army" the laborers required by the Japanese to construct the railway. The Japanese, however, expected to provide all technical assistance needed in Burma from the outside.[181] About 50,000 Burmese would die during the construction of the line.

The Japanese Imperial Command Group issued orders for the construction of a railway from Kanchanaburi in Thailand, to Thanbyuzayat in Burma, on 12 March 1942.[182] That same month, the commander of the Southern Field Railway Group in Saigon ordered preparations to begin for construction of the railway.[183] The Battle of Midway began on 4 June and ended on 7 June 1942. There was never a "cause and effect" relationship between the Battle of Midway and the construction of the Thai-Burma Railway. Any cause and effect relationship between the rail and the battle lay only in the minds of those seeking to explain away the horror of its construction to some other, known, large-scale event. There remains however, a persistent cause and effect relationship between Japan's bomb program and the rail line.

Construction materials for the line in Thailand; including tracks and sleepers (crossties), were brought into the country from dismantled branches of the Federated Malay States Railway network, and from the Netherlands East Indies. Most of the rails used in the construction of the Death Railway in Burma were obtained from other rail lines dismantled within the country itself, including tracks removed from the previously constructed and completed Kra Isthmus Railway (Kra Canal Railway or the Chumphon-Kraburi). A communications road was constructed adjacent to and along the path of the railway to provide for the transport of railway construction materials that could not be moved inland over local waterways. The road added additional haul capacity to the previously existing secondary road network already extending across the border of Burma and Thailand.

On 5 June 1942, one day after the start of the Battle of Midway, a Japanese survey team ritualistically hammered a survey marker into the ground at the 0.0-kilometer marker in the Nong Pladuk railyard. Fifteen days later, Tokyo officially executed the order to build the "Thai-Burma Rail Link" at an approved cost of 100 million yen, with completion slated for no later than November 1943. Actual construction on the line began in Thailand on 22 June 1942 and in Burma at roughly the same time. Three weeks after the Battle of Midway, as the Imperial Japanese Navy hid its defeat at Midway from the Japanese Army for months, there is even less reason to associate the two events.

Sea Transport

Japanese shipping in the area was always vulnerable to attack by submarine, however considering the few Japanese ships lost in that region, vessels west of the Malayan Peninsula were far safer than those traveling the South Pacific. Throughout 1942, while Japan lost few ships on the west side of the Malay Peninsula, elsewhere Japan was losing merchantmen at alarming rate. What Japanese merchantmen remained after 1942 were needed in the Pacific to support Japanese outposts at Rabaul, New Guinea, Guadalcanal, Okinawa, Saipan and other faraway locations. It should be noted that Japan did not begin to lose ships in the area of Burma in large numbers until late 1943; after the rail line was complete. Again, there was no cause and effect. Once the rail was in operation and often under attack, Japanese merchant shipping around Malaya to Rangoon actually increased. The number of ships lost continued to increase simply because the number of targets in the area had likewise, continued to multiply. By the end of the war, those Japanese merchantmen still afloat sailed nearer to the coast in the shallower waters around Japan and the Asiatic mainland to avoid Allied submarines, surface vessels and air patrols.[184] Apparently, cargo transport out of Burma was never entirely coordinated between merchant, army cargo ship, and the railway.

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[178] Monsicha Rungchawannont. A journey to the past. An analysis of the contemporary display of the Death Railway, Thailand. MA Thesis. Archaeological Heritage Management. S1573772. Supervisors: dr. M. H. van den Dries. Leiden University, Faculty of Archaeology. Leiden, June 4th 2015

[179] Reynolds. Bruce E. International Orphans': The Chinese in Thailand During World War II. Journal of Southeast Asian Studies. 1997

[180] Monsicha Rungchawannont. A journey to the past. An analysis of the contemporary display of the Death Railway, Thailand. MA Thesis. Archaeological Heritage Management. S1573772. Supervisors: dr. M. H. van den Dries. Leiden University, Faculty of Archaeology. Leiden, June 4th 2015

[181] ARMY SERVICE FORCES MANUAL M354-18A CIVIL AFFAIRS HANDBOOK JAPANSECTION 18A: JAPANESE ADMINISTRATION OVER OCCUPIED AREAS-BURMA. HEADQUARTERS, ARMY SERVICE FORCES. 2 AUGUST 1944

[182] Warland, Andrew. Thai Burma Railway 1939 - 1945: 'F Force' Official Report. http://www.andrewwarland.com.au/FForce/FForceIntro.html

[183] Hornfischer, James D. In the Jungle of the Kwai - Ship of Ghosts: The Story of the USS Houston, FDR's Legendary Lost Cruiser, and the Epic Saga of Her Survivors. New York. Bantam. 2007

[184] King, Ernest J. Jr. Summary of U. S. Submarine Operations in WWII. U. S. Navy at War. 1941-1945. Official Reports to the Secretary of the Navy. Third and Final Report. Washington, D. C. http://www. valoratsea.com/King.htm

Prior to its construction, the Japanese depended upon sea transport to bring supplies and troops to Burma around the Malay Peninsula, through the Strait of Malacca and the Andaman Sea, to Rangoon, Burma. The goal of the Japanese in building the Thai-Burma Railway was to build a single-line, meter-gauge railway capable of transporting 3,000 tons of supplies and strategic materials a day between Thailand and Burma. It was not necessarily the need for materials that drove the Japanese to build the Thai-Burma Railway, but the weight of the materials that had to be transported in or out, and the secrecy in which those materials had to be transported. Cut-outs, sidings and camouflaged areas of the track were built all along its 258 miles to protect trains caught in the open while running the line, but also to prevent observation of the materials carried to include barrels of uranium oxides.[185] To avoid a hazardous 2,000 miles (3,200 km) sea journey around the Malay Peninsula, a railway from Bangkok, Thailand to Rangoon, Burma made some sense. Once the material was in Bangkok, it could then be shipped overland and via rail to Saigon and Haiphong in Indochina even further improving the material's safety.

Construction Start

Work at the Thai end of the rail began on 22 June 1942. Construction of the railway in Burma began on 15 September 1942. The original projected completion date was December 1943. The Japanese Army rail corps assigned were, as militaries worldwide, highly organized.[186]

The Japanese employed 15,000 of their own personnel to deal with the technical aspects of the construction and to control unskilled labor. Many of the engineers and others were civilians, about 3,000 men, the majority of the railway guards, were Korean.

During its construction, the Japanese Army Kempeitai were also present also along the rail line, but did not guard the POWs, did not guard the rail line, or manage its construction.[187] Their actual purpose along the railway remains imprecise but may be related to counterintelligence. Ken Adams, a medic with the RAMC who worked in the camp hospital at Kanchanaburi noted that, "The Kempeitai's presence increased through the year. These stocky little policemen with their fondness for torture, dark glasses and swords that were too big for them, filled everyone with fear. They didn't often make forays into our quarters but were unnecessarily destructive when they did, throwing our kit about with abandon. A lingering look from them made you quake."[188] The presence of the Kempeitai along the railway however, rarely seems to be noted among POW survivors outside the camp at Kanchanaburi. Most of the POWs located in the Kilo Camps up the line who had direct encounters with the Kempeitai seem to have been sent to the Kanchanaburi camp for interrogation by camp guards under the direction of the local camp commander. In Burma, the Burma Defense Army worked directly with the Kempeitai, managing Burmese workers and their camps.[189] Again, the role of the Kempeitai seems limited to the base camps in Burma and Thailand.

Railway Regiments

The 5th Railway Regiment was established in April 1938, saw action and constructed or repaired railways in China, Burma, Malaya and Singapore. The 9th Railway Regiment was formed in September 1941 and saw action in Indochina and Burma before transferring to Bangkok.[190] Each unit was commanded by a Colonel and consisted of about 300 army men and about 2,200 conscripted employees of Japanese National Railroad (JNR). The two units left Osaka on 27 October in a convoy of eight ships and landed at Haiphong, Indochina (now Vietnam), on 7 November 1941. When it entered Indochina in 1941, the Japanese Imperial Army allowed the Vichy French government to continue its administration of the colony, but after the liberation of France, as the US sweep across the Pacific closed on the Asian mainland, the Japanese, concerned by the French threat against their back, moved to take full control. On 9 March 1945, the Japanese initiated *Operation Mei-go*, their contingency plan to take over Vietnam. Railway Regiments gradually moved to Phnom Penh, and on 9 December, to Thailand to operate southbound trains. The 5th Special JNR Unit left Bangkok on 2 April, embarked at Singapore and arrived at Rangoon on 20 April, where it assembled and modified C56 engines at the Insein factory to work on the narrower-gauge rail lines. The 5th Railway Regiment took over operation of all railways in Burma from the 9th Railway Regiment on 10 June 1942, by which time plans were under way for the construction of a new railway linking Burma and Thailand. The two JNR railway regiments started surveying the railway line, the 5th Regiment on the Burma side and the 9th on the Thailand side.[191]

The construction of the railway was under the command of the Southern Army Railway Corps. In September 1942, the 5th Railway Regiment was transferred from operating rails between Rangoon and Mandalay and ordered to Thanbyuzayat, Burma. In August 1942,

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[185] Futamatsu, Yoshihiko. Across the Three Pagodas Pass, The Story of the Thai-Burma Railway. Renaissance Books. Ket, England. 2013
[186] Summers, Julie. "The Colonel of Tamarkan: Philip Toosey and the Bridge on the River Kwai." National Army Museum. Australia. 2005 p. 6
[187] PULVERS, ROGER. War criminal's son and British 'railway man' bridge war's painful divide. https://www. japantimes. co. jp/opinion/2012/04/08/commentary/war-criminals-son-and-british-railway-man-bridge-wars-painful-divide/#. WffYotenG70
[188] Kempeitai of WWII and the POW's. Pacific Paratrooper. https://pacificparatrooper. wordpress. com/2017/06/08/kempeitai-of-wwii-and-the-pows/
[189] Won Zoon Yoon: "Japan's Occupation of Burma, 1941-1945." New York University. Ph. D. Thesis. 1971 cited in Boggett, David. NOTES ON THE THAI-BURMA RAILWAY, PART I: "AN APPALLING MASS CRIME" http://www. aiipowmia.com/wwii/thaiburma.pdf
[190] Warland, Andrew. Thai Burma Railway 1939 - 1945: 'F Force' Official Report. http://www.andrewwarland.com.au/FForce/FForceIntro.html
[191] Tamayama, Kazuo. Railwaymen in the War. Tales by Japanese Railway Soldiers in Burma and Thailand 1941–47. PALGRAVE MACMILLAN. New York. 2005

the 9th Railway Regiment was moved from repairing lines north of Mandalay to Ban Pong, Thailand.[192] The 5th Railway Regiment was responsible for the Burma section of the line, while the 9th Railway Regiment supervised the construction of the Thailand section.[193]

Tamayama Kazuo, in the *Railwaymen in the War*, wrote: "The two railway regiments then moved to Burma and repaired railways that had been demolished by the retreating British. After the Special JNR units were transferred to the operations in Burma, the two regiments played the key role in the construction of the Burma–Thailand railway, a very arduous task deep in rugged mountains where cholera, malaria and tropical diseases were rife. The 415-kilometre railway was built within 15 months, which was a remarkable engineering achievement, but one accomplished at the cost of the deaths of 12,626 prisoners of war (British, Dutch and Australian), more than 15,000 local workers (Burmese, Thais, Tamils etc.) and 1,000 Japanese. The extreme hardships of the PoWs engaged in the construction work, which resulted in the high death rate of 25 per cent, have been well documented in various publications."[194] The number of deaths, however, were much higher than even Tamayama could admit.

The Work

According to Edward Chaplin, "Their idea of getting a job done was to put masses of men on it. The tools were shoddy and inadequate. The railway was built with a few pulleys, derricks, cement mixers, a lot of hard labor and a tremendous amount of ingenuity.[195]

"The shovels were made out of petrol tins and bent in no time. The rock drills were often as blunt as hammers. The hammers broke. The pick axes were made of cast iron and the axes were not forged. It is an amazing thing that the railway ever got through. Sometimes there were so many useless tools that the POWs had to dig with their hands. 'Hellfire Pass,' the 100-foot-deep cutting at Kanu 2, was done chiefly by Australians, and the Nips certainly drove them. Cutting was faster than tunneling. They did a lot of night work. We did no night work. This 100-foot-deep cutting was probably the biggest job on the whole railway. Millions of tons of rock had to be blasted away. Blasting went on night and day every 3 or 4 hours."[196] It took a tremendous toll on its builders.

> *The road had petered out as the undergrowth changed to forest and then into a vast cathedral of vegetation with a ceiling of unbelievable height that veiled the occasional light filtering through. The forced marches continued through the nights and memories of them have become a compression of smells and feelings; plodding along a glutinous track thick with pitfalls, faces and bodies swollen and stinging from insect bites and cuts from overhanging branches that whipped back at us. Now it felt and smelt as I had imagined the jungle would: encroaching, oppressive and rotting. We were very aware of it confining us, although we barely caught a clear sight of it at first. The frequent rainstorms became more violent and the approximate track turned into a quagmire of calf-deep black slime…. I can still recall the bizarre sucking noise made by hundreds of feet being put down and pulled out of the mud*.[197]
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> -Ronald Searle, cited in: Hornfischer, James D. *In the Jungle of the Kwai - Ship of Ghosts: The Story of the USS Houston, FDR's Legendary Lost Cruiser, and the Epic Saga of Her Survivors*

Construction camps housing at least 1,000 workers each were established every five to 10 miles (8 to 17 km) along the route. Construction camps consisted of open-sided barracks built of bamboo poles with atap roofs. Barracks were about sixty meters (66 yards) long with sleeping platforms above the ground on each side of an earthen floor. Two hundred men were housed in each barracks, giving each man a two-foot wide space in which to live and sleep. The camps were usually named after the kilometer distance marker along the rail at which they were located: The Kilo-Caps. Workers were moved up and down the railway line as needed.

The way the system worked was that the Japanese engineer would determine how deep and how far the prisoners needed to dig each day to make a level rail bed atop which tracks could be laid evenly, as well as how many prisoners would do the work. A typical order might be for 75 meters with 100 prisoners. The Japanese didn't care whether it was mud, dirt, solid rock or how long the prisoners had to work into the night to accomplish the task assigned. This wasn't so bad when construction started – the rainy season was far past by this point so the dirt was soft and easy to move.[198]

Each prisoner was expected to move 1.5 cubic meters of dirt. This was incrementally increased to 3.2 meters. This increased work came at the start of the monsoon season where up to 280 inches of rain could fall a month. In fact, the construction of the Thai-Burma Railway was done almost entirely in the rain, from April to November 1943, in one of the worst monsoon seasons of the twentieth century. The rain helped spread cholera and dysentery, drenched the huts, turned the roads into such mud that neither six-wheel-drive

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[192] Beaton, T. R. Lieutenant Colonel, RAEME. From Both Ends of the Siam-Burma Railway Australian Defence Force Journal. NO. 113 JULY/AUGUST 1995. http://www. defence. gov. au/adc/adfj/Documents/issue_113/113_1995_Jul_Aug.pdf

[193] Constructing the railway. The Thai–Burma Railway and Hellfire Pass, http://anzacportal.dva.gov.au/history/conflicts/thaiburma-railway-and-hellfire-pass/events/building-hellfire-pass/constructing

[194] Tamayama, Kazuo. Railwaymen in the War. Tales by Japanese Railway Soldiers in Burma and Thailand 1941–47. PALGRAVE MACMILLAN. New York. 2005

[195] Murray, Scott. The Death Railway - CanCham Thailand. 20 MAY THE DEATH RAILWAY. Posted at 22:26h in CanCham News. https://canchamthailand.org/tccc-news/

[196] Chaplin, Edward ("Ted"). SINGAPORE AND THE THAI RAILWAY, EXPERIENCES OF CAPTIVITY, 1942 – 1945. Singapore Royal Artillery (Volunteer), Straits Settlement Volunteer Force, Written October/November 1945

[197] Hornfischer, James D. In the Jungle of the Kwai - Ship of Ghosts: The Story of the USS Houston, FDR's Legendary Lost Cruiser, and the Epic Saga of Her Survivors. New York. Bantam. 2007

[198] The Adventures of Eddie Fung: Chinatown Kid, Texas Cowboy, Prisoner of War, edited by Judy Yung. University of Washington Press. 2007

trucks nor elephants could make it through but the men – they had to, carrying tools, equipment and 100 kilo sacks of rice.[199] Prisoners without shoes could hardly move about in the mud while carrying the weight of water in addition to dirt in discarded rice bags that two men would carry between two poles. This was the only equipment provided to carry dirt away.[200] Their workdays were now "from can't see to can't see" as they said, about 18 hours every day.[201]

Rations were set at one pound of rice per man per-day. But rations were determined by how many men actually worked. If the Japanese only wanted 100 out of 500 men to work that day, then only rations for 100 men were given. Later on, as prisoners became weaker and sicker, they were lucky to have 20% of the men available for work. Sometimes the sick were simply left behind. 1/5 rations amounted to only a spoonful of rice per man per-day. To this was added whatever vegetables and fruits the men could gather from the jungle or traded for from the natives, with some vegetables and meat provided by the Japanese. Occasionally, the Japanese would slaughter an ox and give whatever remained of it to the prisoners after taking the majority share. The meat and vegetables would go into the communal stew pot. One time, a python was added to the pot, shot by one of the prisoners, after one of the guards kept missing and finally loaned his rifle out to the prisoner to shoot.[202]

Within months of being in the jungle, the uniforms of the prisoners had virtually dissolved. In humid tropical conditions, the stitches holding their clothes and shoes together disintegrated and leather rotted. The remaining cloth material was fashioned into a type of underwear, jokingly referred to as a G-string, which was based upon the Japanese *fundoshi*. A standard pair of pants legs from the GI issue khaki pants would make two such loincloths.[203]

The exposure of so much skin and bare feet in the tropics left the men vulnerable to lice, leeches, malaria-bearing mosquitoes, and skin-burrowing intestinal worms that would plague them throughout the war. They also had to watch out for snakes, spiders, and scorpions. Exposed skin also made them vulnerable to minor scratches during their work that didn't sound serious but often developed into large and infected bacteria-filled ulcers that could prove fatal. Survivors described desperate men sitting in river water so that the fish could nibble away the infected flesh while others resorted to inserting live maggots into their wounds (something modern surgeons have experimented with as the insect larvae naturally only eat dead tissue). Most agonizing of all was removing the infection with a sharpened spoon as the only available surgical tool. If worst came to worst, then amputation was done without anesthetic or the proper tools. The same bone saw used to provide for the cooking pots was also used for amputations for lack of anything better. No medicine or anti-infectious agents were ever provided by the Japanese. Despite the starvation and ever-increasing poor health, the prisoners always volunteered to donate blood for such rough surgeries.[204] But that was the Thai-Burma Railway, the second such project – conditions on the Kra Isthmus Railway, the first, were far more difficult and set the stage for what would follow.

The Kra Isthmus Railway

Construction on the railway began in June 1943. The Kra Isthmus railway terminated at Ban Khao Fa Chi (village) on the River La Oun, after which goods were trans-shipped along the River Kra to Victoria Point in Burma.[205] The railway was some 90-kilometers long and completed six months after its start in November 1943 by drafting laborers only from Malaya, including ethnic Malays and Chinese.[206] The railroad connected the Bangkok-Singapore Line westward to the west coast of the Kra Isthmus near Victoria Point. Because the railway would not be connected directly with other lines in Burma, it was necessary to build a pier and port at Kao Huakang to ship soldiers, food and armaments across the sea.[207] No POWs are known to have worked on this line. Work on the Kra Railway proceeded on a 24-hour-a-day basis. Neither doctors nor medicines were available.[208] Conditions during the construction of the Kra Isthmus Railway were far worse than those on the Thai-Burma Railway. On the Kra Isthmus Railway, the Japanese were fully prepared to work their Malaysians to death. Cars carrying an unknown cargo from Victoria Point returned to Kao Huakang.

Due to heavy Allied bombing, the Kra Isthmus Railway was abandoned after less than a year in operation and was not used after November 1944.[209] Its materials were removed and incorporated into the Thai-Burma Railway, probably as sidings, turning wyes and hidden parking.

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[199] Rowland, Robin. Why Former POWs and their families hate and love The Bridge on the River Kwai (The Reception of The Bridge on the River Kwai among Former Far East Prisoners of War). David Lean Centenary Conference. Queen Mary University. London. 25 July 2008. Revised: 25 October 2008

[200] The Adventures of Eddie Fung: Chinatown Kid, Texas Cowboy, Prisoner of War, edited by Judy Yung. University of Washington Press. 2007

[201] The Adventures of Eddie Fung: Chinatown Kid, Texas Cowboy, Prisoner of War, edited by Judy Yung. University of Washington Press. 2007

[202] The Adventures of Eddie Fung: Chinatown Kid, Texas Cowboy, Prisoner of War, edited by Judy Yung. University of Washington Press. 2007

[203] The Adventures of Eddie Fung: Chinatown Kid, Texas Cowboy, Prisoner of War, edited by Judy Yung. University of Washington Press. 2007

[204] The Adventures of Eddie Fung: Chinatown Kid, Texas Cowboy, Prisoner of War, edited by Judy Yung. University of Washington Press. 2007

[205] Boggett, David. NOTES ON THE THAI-BURMA RAILWAY, PART II: ASIAN ROMUSHA; THE SILENCED VOICES OF HISTORY. http://www. aiipowmia. com/wwii/thaiburma.pdf

[206] Boggett, David. NOTES ON THE THAI-BURMA RAILWAY, PART I: "AN APPALLING MASS CRIME" http://www.aiipowmia.com/wwii/thaiburma.pdf

[207] NA. Bo. Ko. Sungsut, 2. 4. 1/7 Naeosenthang lae phaenphang sathani Chumphon thangyaek thangrot fai tat thangluang [Route and diagram of Chumphon station junction of railway and highway] (31 May 2486 [1943] 19 January 2488 [1945]). Cited in: Kiattisahakul, Puengthip. Assistant Professor, Faculty of Arts, Silpakorn University. Part Three: Economic and Cultural Issues. The Japanese Army and the Control of Southern Thai Railways, 1941-1945

[208] Boggett, David. NOTES ON THE THAI-BURMA RAILWAY, PART IX: THE KRA ISTHMUS RAILWAY. http://www.aiipowmia.com/wwii/thaiburma.pdf

[209] Boggett, David. NOTES ON THE THAI-BURMA RAILWAY, PART II: ASIAN ROMUSHA; THE SILENCED VOICES OF HISTORY. http://www.aiipowmia. com/wwii/thaiburma.pdf

POW into the Grinder

The movement of Allied POWs northward from Changi Prison in Singapore and other prison camps in Southeast Asia began in May 1942. The first prisoners of war, 3,000 Australians, to go to Burma departed Changi on 14 May 1942 and journeyed by sea to a point near Thanbyuzayat, Burma, the northern terminus of the railway. There they worked on airfields and other infrastructure projects before beginning construction of the railway in October 1942. The first prisoners of war to work in Thailand, 3,000 British soldiers, left Changi by train in June 1942 to Ban Pong, the southern terminus of the railway. Prisoners of war quickly "found themselves at the bottom of a social system that was harsh, punitive, fanatical, and often deadly."[210] Additional prisoners of war were imported from Singapore and the Dutch East Indies as needed as construction advanced and the weak died. This included American soldiers and sailors from the Texas Army National Guard and survivors of the *USS Houston*.

In the initial stages of construction, Burmese and Thai were primarily employed in their respective countries, but Thai workers, in particular, were likely to flee from the project at the first opportunity. The independent status of Thailand also presented the Japanese military with certain complications. An early attempt to use Thai labor on the first section from the Nong Pladuk terminal ended with the Ban Pong Incident of 18 December 1942 when a Japanese sentry struck a Thai monk on the head because of his presence in a restricted area.[211] When the monk complained to fellow Thais working as laborers on the rail line, they mounted an attack upon the Japanese garrison stationed at Wat Don Tum (Temple) in Ban Pong. Thai officials and the Japanese guards called on the Kempeitai for assistance, who sent out a call for reinforcements.

The Kempeitai arrived at the height of the brawl which now involved several hundred people. The Kempeitai quickly established a perimeter around the police headquarters deploying men armed with rifles and two machine guns. Then a black car with two truckloads of armed soldiers approached. It was later concluded that an anxious Thai soldier probably fired first. Firing from the two sides began and continued for several minutes before it could be brought under control.[212] Mutual hostility and suspicion were the root cause of the revolt. After Ban Pong Incident, Thai workers enlisted in much smaller numbers leading to the enormous use of *romusha* Asians from other areas (Java, Malaya, French Indochina, etc.) on the Thai section of the railway.[213] As the Thai and Burmese, Japanese allies, seemed less-than enthusiastic about working on the railway, the Japanese were forced to import other Asians to fill the void.

The *Romusha*

In early 1943, the Japanese advertised for workers in Malaya, Singapore, and the Dutch East Indies. Later known as *romusha*, the laborers were promised good wages, short contracts, and housing for their families. When advertising failed to attract sufficient workers, the Japanese resorted to more coercive methods, rounding up workers by force, especially in Malaya. As pressure for the completion of the railway built up, it became increasingly difficult for the Japanese to replace people dying in Thailand.[214] According to M. C. Ricklefs in his work, *A History of Modern Indonesia Since c. 1200*: "In October 1943, the Japanese ordered the recruitment of 'economic soldiers' (*romusha*), primarily peasants drafted from their villages in Java and put to work as labourers wherever the Japanese needed them, as far away as Burma and Siam. It is not known how many men were involved, but it was probably at least 200,000 and may have been as many as half a million, of whom not more than 70,000 could be found alive at the end of the war."[215]

On 28 March 1943, representatives of the Japanese Army railway unit requested that the Thailand Chinese Chamber of Commerce recruit 10,000 Chinese laborers, to include skilled workers, at wages ranging from 2.7 to 3.5 baht per day. On 3 April, the Thai government threw its weight behind the Japanese request by sending government officials to pressure the Chamber of Commerce to cooperate.[216] That following June, the Japanese asked the Thai government for another 23,000 Thai laborers. The Thai government once again turned to the Chinese Chamber of Commerce. Now wiser to Japanese methods, the Chinese Chamber of Commerce contracted the issue to a Japanese contractor.[217] The Japanese contractor engaged about 13,000 laborers, half of whom fled before reaching the rail line.[218]

The Burmese, who had initially welcomed the Japanese as a method to end British rule, cooperated with the Japanese in recruiting workers, but most Burmese wandered off the project at the first opportunity.[219] Ba Maw, the head of the BCEA and later Prime Minister of Japanese-sponsored "independent" Burma, had enthusiastically promoted the railway project and continued to express his admiration for the railway's achievements after his subsequent escape to Thailand on 15 August 1945.[220] However, the drain of

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[210] La Forte, Robert S. With Only the Will to Live: Accounts of Americans in Japanese Prison Camps 1941–1945. Wilmington, Delaware. 1993
[211] The silenced voices of history: Asian workers on the Death Railway. THIRD WORLD RESURGENCE. No. 278, October 2013, pp 44-47; https://www.twn.my/title2/resurgence/2013/278/anniversary1.htm
[212] Boggett, David. Notes on the Thai-Burma Railway. Part VIII Thai Labour and the Ban Pong Incident. Death Railway Organization. Journal of Kyoto Seika University. No. 26. http://www.deathrailway.org/wp-content/uploads/2015/11/Part-8-Thai-Labour-The-Ban-Pong-Incident-1.pdf
[213] Boggett, David. Notes on the Thai-Burma Railway. Part VIII Thai Labour and the Ban Pong Incident. Death Railway Organization. Journal of Kyoto Seika University. No. 26. http://www.deathrailway.org/wp-content/uploads/2015/11/Part-8-Thai-Labour-The-Ban-Pong-Incident-1.pdf
[214] Boggett, David. "Notes on the Thai-Burma Railway. Part II: PART II: ASIAN ROMUSHA; THE SILENCED VOICES OF HISTORY." http://www.kyoto-seika.ac.jp/researchlab/wp/wp-content/uploads/kiyo/pdf-data/no20/david.pdf
[215] Ricklefs, M.C. "A History of Modern Indonesia Since c. 1200:" Stanford University Press, 2001
[216] Reynolds. Bruce E. International Orphans': The Chinese in Thailand During World War II. Journal of Southeast Asian Studies. 1997
[217] Reynolds. Bruce E. International Orphans': The Chinese in Thailand During World War II. Journal of Southeast Asian Studies. 1997
[218] Reynolds. Bruce E. International Orphans': The Chinese in Thailand During World War II. Journal of Southeast Asian Studies. 1997
[219] Forbes, Cameron. Hellfire. The Story of Australia, Japan and the Prisoners of War. Pan Macmillan. Australia. 2005
[220] Boggett, David. NOTES ON THE THAI-BURMA RAILWAY, PART I: "AN APPALLING MASS CRIME" http://www.aiipowmia.com/wwii/thaiburma.pdf

laborers from the country caused unforeseen hardships.

The Japanese Military Administration itself estimated Burma's rice paddy crop in 1942-43 at half the normal yields. There were various contributory factors: "The shortage of agrarian manpower needed for rice cultivation was largely caused by the compulsory recruitment of Burmese peasants to engage in Japanese military projects, such as bridge repair, road maintenance, railway and airfield construction, and to work in factories, mines, harbors, and other military installations. For a single project of building the Burma-Thailand Railway, for instance, some 85,000 (sic) Burmese, mostly peasants, were forcibly recruited by the Japanese Military Administration."[221] Over time, the Burmese would begin to starve as food became scarce, and the rail lines formerly used to transport Burma's southern rice-wealth into its cities and more rural mountainous regions failed to return. How many Burmese worked the country's mines or what they mined is unknown. Many were likely used as in Malaya to load pre-existing mining spoils – wastes containing uranium of some unknown quality.

Most *romusha* on the railway were likely compelled to work on the line rather than volunteered. Approximately 90,000 Burmese and 75,000 Malayans slaved on the line. Other nationalities and ethnic groups working on the railway included Chinese, Karen, Javanese, Singaporean Chinese, and Vietnamese.

The problem with the numbers of Asians involved on the Thai-Burma Railway is complicated by the fact that *romusha* mobilization in Java for work both within and outside Java is of truly enormous proportions. Sato Shigeru wrote: "Nonetheless, the Japanese *romusha* mobilisation certainly involved many millions of people, and its impact on Javanese society was much greater than Ricklefs' figures suggest.... Assuming that, during the twenty months between January 1944 and August 1945, each temporary worker worked for about two months, the total number of people who were mobilised as temporary *romusha* accounts to nearly 10,000,000."[222]

Documents indicate that more than 100,000 Malayan Tamils alone were caught up in the construction. "Tamils were extensively used as coolies on the Death Railway at Kanchanaburi, where thousands died."[223] Details about the number of Vietnamese dragooned to slave on the rail are few and even harder to come by, but the Imperial Japanese Army dedicated a monument to those lost in the construction of the line, which mentions the Vietnamese.[224] Many of the Asian *romusha* were illiterate, poor, helpless peasants forcibly conscripted – or callously lured by false promises of riches – and unaware of their ultimate destination.[225] The number of Southeast Asian workers recruited or impressed to work on the Burma railway has been estimated to have exceeded 180,000, of whom as many as half are thought to have died during its construction. However, there is a considerable body of information suggesting that the accepted numbers of Asian laborers used in construction of the Thai-Burma Railway have been grossly underestimated.[226] According to K. A. de Weerd in his statement to the International Military Tribunal for the Far East in December 1946, "The correct figures of those who were transported outside Java as *romusha*.... are not known; the official estimates of the Japanese after the capitulation mention the figure of 270,000 men, of whom not more than 70,000 have been recovered since the war."[227]

Conditions

As pressure from Tokyo to complete the railway increased, the brutality displayed by Japanese and Korean guards similarly intensified. Burmese began to avoid recruitment and flee the project nearly as fast as they could be replaced. When volunteers could not be obtained, anyone that filled the bill would simply be taken.[228] Japanese soldiers are widely remembered as being cruel and indifferent to the fate of Allied prisoners of war and the Asian *romusha*. The guards – mainly Korean conscripts – were considered inferior by the Japanese and treated as such. Many men in the workforce bore the brunt of pitiless or uncaring guards. Cruelty could take different forms, from extreme violence and torture to minor acts of physical punishment, humiliation and neglect. 15,000 Japanese soldiers, including 800 Koreans, were employed on the railway as engineers, guards, and supervisors of the POW and *romusha* laborers. Though working conditions were far better for the Japanese than the prisoners of war and *romusha*, about 1,000 (8 percent) of the Japanese force working on the rail also died during its construction. Not to be forgotten, documents indicate that in Burma, local "defense troops" were actively involved in supervising the laborers. These "defense troops" were local Burmese soldiers, now renamed as the Burma Defense Army, formerly attached to Aung San's Burma Independence Army.[229] Working conditions for the *romusha* were, however, deadly. It is estimated that 90 percent of those Asians employed by the Japanese on the rail perished.

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[221] Won Zoon Yoon: "Japan's Occupation of Burma, 1941-1945." New York University. Ph. D. Thesis. 1971 cited in Boggett, David. NOTES ON THE THAI-BURMA RAILWAY, PART I: "AN APPALLING MASS CRIME" http://www. aiipowmia. com/wwii/thaiburma.pdf

[222] Ricklefs. M. C. "A History of Modern Indonesia." London. 1981 found in Boggett, David." Notes on the Thai-Burma Railway. Part II: PART II: ASIAN ROMUSHA; THE SILENCED VOICES OF HISTORY." http://www. kyoto-seika. ac. jp/researchlab/wp/wp-content/uploads/kiyo/pdf-data/no20/david.pdf

[223] Darshan Singh Bajaj cited in Roger Beaumont; "The Hidden Truth: A Tribute to the Indian Independence Movement in Thailand." Minerva. London. 1999

[224] Boggett, David. "Notes on the Thai-Burma Railway. Part II: PART II: ASIAN ROMUSHA; THE SILENCED VOICES OF HISTORY." http://www. kyoto-seika. ac. jp/researchlab/wp/wp-content/uploads/kiyo/pdf-data/no20/david.pdf

[225] Boggett, David. "Notes on the Thai-Burma Railway. Part II: PART II: ASIAN ROMUSHA; THE SILENCED VOICES OF HISTORY." http://www. kyoto-seika. ac. jp/researchlab/wp/wp-content/uploads/kiyo/pdf-data/no20/david.pdf

[226] Boggett, David. "Notes on the Thai-Burma Railway. Part II: PART II: ASIAN ROMUSHA; THE SILENCED VOICES OF HISTORY." http://www. kyoto-seika. ac. jp/researchlab/wp/wp-content/uploads/kiyo/pdf-data/no20/david.pdf

[227] Won Zoon Yoon; op. cit.; p. 225. The figure of 30,000 Burmese deaths is taken from International Military Tribunal for the Far East, Document No. 406; "Summary of Questions & Answers of Former Burmese Prime Minister Ba Maw on May 22, 1946" found in Boggett, David. "Notes on the Thai-Burma Railway. Part II: Asian Romusha: The Silenced Voices of History." http://www. kyoto-seika. ac. jp/researchlab/wp/wp-content/uploads/kiyo/pdf-data/no20/david.pdf

[228] Won Zoon Yoon: "Japan's Occupation of Burma, 1941-1945. "New York University. Ph. D. Thesis. 1971 cited in Boggett, David. NOTES ON THE THAI-BURMA RAILWAY, PART I: "AN APPALLING MASS CRIME." http://www. aiipowmia. com/wwii/thaiburma.pdf

[229] Boggett, David. NOTES ON THE THAI-BURMA RAILWAY, PART I: "AN APPALLING MASS CRIME." http://www. aiipowmia. com/wwii/thaiburma.pdf

British doctor Robert Hardie wrote: "The conditions in the coolie camps down river are terrible, Basil says: They are kept isolated from Japanese and British camps. They have no latrines. Special British prisoner parties at Kinsaiyok bury about 20 coolies a day. These coolies have been brought from Malaya under false pretences [sic] – 'easy work, good pay, good houses!' Some have even brought wives and children. Now they find themselves dumped in these charnel houses, driven and brutally knocked about by the Jap and Korean guards, unable to buy extra food, bewildered, sick, frightened [sic]. Yet many of them have shown extraordinary kindness to sick British prisoners passing down the river, giving them sugar and helping them into the railway trucks at Tarsao."[230]

To maintain discipline, the Japanese organized the prisoners of war into groups of 100, known as a *kumi*. If any single prisoner of war successfully escaped, they were told that ten members of the *kumi* would be executed. If all 100 men escaped from the *kumi* then the two neighboring kumis would be executed. Nevertheless, prisoners still tried to escape. A group of three Australians were caught. One had acute appendicitis and had been left behind by the others. The Japanese removed the appendix, waited until the man recovered, then tied all three men blindfolded to stakes in front of the other prisoners where they were shot. Eddie Fung, an American POW working on the railway, described a series of atrocities and punishments. One of the worst was that of an interpreter who had somehow displeased the Japanese. He was forced to stand in a full cesspool for hours until his legs gave out and he drowned. The prisoner commander begged the Japanese to show mercy but the Japanese refused because it had been their intention to kill the man all along.[231]

As Fung reported, when Allied bombers took out part of a railway bridge, the prisoners had to unload one train, transport the goods across the gap, and load a train on the other side. They worked for five days and nights without any sleep. The work was done while rations were being cut more and more because of the long distance from supply sources, pilferage along the way, and the fact that more and more men were too sick to work. As it was Japanese policy to only give enough rations to feed the men that actually worked that day, no food was provided for those who did no work. The Japanese also periodically weighed the prisoners. Fung later found out that the Japanese theory was that the less a man weighed, the less food he needed so they cut the rations even more. The Japanese also proved to be even less helpful as scrounging targets now, because they were also short of rations.[232]

As the Imperial Japanese Army needed their top military officers and most able-bodied soldiers elsewhere in the war effort, those officers placed in charge of POW camps were usually older, not the most competent administrators, or, in the case of individual camps, lower in rank, such as lieutenants or non-commissioned officers. During the construction period, the engineers of the Imperial Army's 5th Railway Regiment (Thailand) and 9th Railway Regiment (Burma) had authority over POW accommodation group and local camp commandants. Each camp also had a POW commandant who had several adjutants representing various constituencies. In camps where POWs of different nationalities were billeted together, each group had its own section of the camp where it maintained its own identity and authority.[233]

There were also numerous small out-of-the-way camps where conditions were even more primitive and brutal. These small camps lay deep within the jungle and were inaccessible to labor officers or visiting inspection teams. Burmese government officials were encouraged not to visit the camps. The Japanese superintendents in those unvisited spots were in many cases war-brutalized men, who drove the workers like slaves, seized whatever they needed for their work from the area, most often without compensation, and behaved like slave-drivers.[234]

Speedo!

The worst months of the construction period, known as "*speedo*," began in April 1943 and continued through to the completion of the line in October 1943. While the word "*speedo*" was often heard by other prisoners of war in other camps outside the railway, this single period of construction is the only known occasion throughout the Japanese prisoner of war camp system in all of East Asia where workers were worked to death outright. To increase the speed of construction, the Southern Army sent two motorcar companies and 300 supply motor-trucks and increased the line's motor corps (two corps, five sections).[235] Discussed at the IMTFE, it is the only mention of motor vehicles along the rail line.

Speedo was brought about by order of the Japanese Imperial Headquarters in Tokyo which decided that construction was behind schedule and moved the project's completion date forward to May 1943.[236] Colonel Wild, who was a prisoner along the rail line and served as a liaison officer between the POW and Japanese officers on the railway during the war, testifying at the IMTFE said, "For strategic reasons the completion of the railway was most urgent…." What those strategic reasons were, Wild never explained. If anyone on the railway knew what the line was carrying out of Burma and into Thailand, it was probably Cyril Wild, and this knowledge may have had something to do with his untimely death in a controversial plane crash in Hong Kong on 25 September 1946.

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[230] Boggett, David. "Notes on the Thai-Burma Railway. Part II: Asian Romusha: The Silenced Voices of History." http://www.kyoto-seika.ac.jp/researchlab/wp/wp-content/uploads/kiyo/pdf-data/no20/david.pdf

[231] The Adventures of Eddie Fung: Chinatown Kid, Texas Cowboy, Prisoner of War, edited by Judy Yung. University of Washington Press. 2007

[232] The Adventures of Eddie Fung: Chinatown Kid, Texas Cowboy, Prisoner of War, edited by Judy Yung. University of Washington Press. 2007

[233] Eldredge, Sears. The Thailand-Burma Railway: An Overview Macalester College. 2014. http://digitalcommons.macalester.edu/cgi/viewcontent.cgi?article=1003&context=thdabooks

[234] Boggett, David. NOTES ON THE THAI-BURMA RAILWAY, PART I: "AN APPALLING MASS CRIME" http://www. aiipowmia. com/wwii/thaiburma.pdf

[235] Report on Employment of War Prisoners in Siam-Burma Railway Construction. Central Investigating Committee Regarding Prisoners of War. IPS Doc. 1509-A. Exhibit 475. Bibliographic ID (link to National Diet Library Online) digidepo_10274234.pdf

[236] Kratoska, Paul H. The Thailand-Burma Railway, 1942-1946: Documents and Selected Writings. Routledge. 2005

Cyril Wild

Before the war, Wild had worked for Japan's Rising Sun Petroleum Company, a subsidiary of Royal Dutch Shell. He had taken classes in the Japanese language and reportedly spoke four of the dialects that existed in Japan at the time fluently. Working for an oil company, it is likely that Wild had a passing knowledge of minerals and ores. Postwar, he served as Britain's War Crimes Liaison for Malaya and Singapore.

Returning to England in June 1940, Wild joined the local Territorial Army regiment, the Oxford and Buckinghamshire Light Infantry. From there he was assigned as an intelligence officer the Third Indian Corps. Later, as a major in Singapore in February 1942, he served as General Arthur Percival's interpreter at the surrender of Singapore. It was Wild who was ordered to carry the white flag of surrender when Percival met with Japan's General Yamashita. Taken POW at the Fall of Singapore, Wild was sent into Thailand as part of F-Force. During the construction of the Thai-Burma Railway, Wild at one time served as the POW commander of the Lower Nieke Camp, part of the Sonkurai Camp system in Thailand. After the war, then Major Wild had held a small party in Rangoon at which he solemnly promised all those who had been part of his news gathering team that he would pursue to the ends of the earth those Japanese responsible for the ill treatment of Allied prisoners.[237] What made Wild so dangerous was that he kept files on the Japanese. He documented them.

At the end of the war, Wild held his evidence in thirty separate files.[238] Wild had so much information that it was necessary for him to liaise with the Australian and New Zealand investigators. Wild had compiled statements and lists of more than 1,000 criminal acts.[239] Most of his evidence concerned Japan's subjugation of Malaya and Singapore, but his files also contained information on Japanese activities as far away as Manchukuo. Even on the Thai-Burma Railway, Wild had uncovered information on Japan's notorious Unit 731 and the country's biological warfare program.[240]

In his postwar role as a war crimes investigator, Wild represented the entire British Empire when he privately interviewed General Yamashita, the Tiger of Malaya in Manila on or about 29 October 1945.[241] Wild spent an hour with Yamashita where he questioned him privately about the war and the atrocities that took place in Southeast Asia, mostly in Malaya and Singapore. In his affidavit he would say, "Since I have been engaged in War Crimes in South East Asia Command, more than 300 war crimes suspects have been brought to trial mainly in Singapore. Of these over 100 have been sentenced to death and over 150 to terms of Banal Servitude."[242]

When Wild arrived in Tokyo to testify, his testimony was considered so important that the panel, then hearing evidence on issues surrounding the Anti-Comintern Pact, interrupted their own schedule to hear his statement. Wild's testimony began on 10 September 1946 and ended nine days later. When Wild was not testifying, he worked with SCAP investigators interviewing former wartime Japanese officers. When Wild stepped down after his testimony, he had only six days to live.

With his testimony at the Tokyo War Crimes Trials over, Wild had informed Generals MacArthur and Willoughby of his intention to arrest the Japanese Emperor, Hirohito.[243] He then departed Japan. In Hong Kong on 24 September, he received orders to fly to Singapore. Wild made enquiries and was informed that there were no planes available. He was later informed that an aircraft, a Dakota, would be standing-by the next day.

On the morning of the 25th, Wild was met by five qualified airmen, four of whom were highly experienced pilots. A number of local Chinese who had apparently hitched a ride were also present. The pilot, Warrant Officer Christie, was an experienced aviator with 489 hours flying time and 389 hours on the Dakota. The copilot, Warrant Officer Blackmore, had 1,352 hours flying time including 427 on Dakota's.[244] In terms of experience, they were not greenhorns.

Blackmore was serving as a trainer, getting in his flight time for the month. Blackmore would have been monitoring everything to ensure Christie followed the correct procedures.[245] The accident occurred 0931 hours, two minutes after takeoff.[246] No one survived. The accident investigation report indicates that the aircraft quickly climbed to between 700 feet and 800 feet before the pilots inexplicably lost control of the plane and crashed some 3km from the airfield. The report concluded that the crash had been caused by turbulence from the surrounding hills, which created a crosswind of as much as 25 knots at 30 degrees to the flight path. It also criticized the pilots for failing to recognize the dangers posed by the turbulence and terrain ahead.[247]

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[237] The murder of Colonel Cyril Wild. FEPOW Community. 24 May 2020. https://www.fepow-community.org.uk/monthly_Revue/html/colonel_wild.htm
[238] Ryall, Julian. Cover-up at Kai Tak? Allies 'caused Hong Kong plane crash that killed 19 to assassinate British investigator.' Post Magazine. 9 Aug 2014. https://www.scmp.com/magazines/post-magazine/article/1569054/blame-resistant
[239] The murder of Colonel Cyril Wild. FEPOW Community. 24 May 2020. https://www.fepow-community.org.uk/monthly_Revue/html/colonel_wild.htm
[240] The murder of Colonel Cyril Wild. FEPOW Community. 24 May 2020. https://www.fepow-community.org.uk/monthly_Revue/html/colonel_wild.htm
[241] Reel, Frank. The Case of General Yamashita. University of Chicago Press. Chicago. 1949
[242] Testimony. Cyril Hew Dalrymple Wild. International Military Tribunal for the Far East. Court House of the Tribunal, War Ministry Building, Tokyo, Japan. 16 September 1946
[243] Ryall, Julian. Cover-up at Kai Tak? Allies 'caused Hong Kong plane crash that killed 19 to assassinate British investigator.' Post Magazine. 9 Aug 2014. https://www.scmp.com/magazines/post-magazine/article/1569054/blame-resistant
[244] The murder of Colonel Cyril Wild. FEPOW Community. 24 May 2020. https://www.fepow-community.org.uk/monthly_Revue/html/colonel_wild.htm
[245] The murder of Colonel Cyril Wild. FEPOW Community. 24 May 2020. https://www.fepow-community.org.uk/monthly_Revue/html/colonel_wild.htm
[246] The murder of Colonel Cyril Wild. FEPOW Community. 24 May 2020. https://www.fepow-community.org.uk/monthly_Revue/html/colonel_wild.htm
[247] Ryall, Julian. Cover-up at Kai Tak? Allies 'caused Hong Kong plane crash that killed 19 to assassinate British investigator.' Post Magazine. 9 Aug 2014. https://www.scmp.com/magazines/post-magazine/article/1569054/blame-resistant

Wild's duplicate files were removed from his office in Singapore before friends could arrive and secure them.[248] They simply disappeared. With Wild's death, many of those guilty of war crimes would never be brought to trial. Was the railroad a strategic necessity for the Japanese Army in Burma, or for the Japanese atomic bomb project in Japan?[249] Wild never said. Was Wild murdered to prevent him from arresting Japan's Emperor? Unlikely as the ultimate authority to arrest Hirohito lay, not with the British, but with MacArthur in Tokyo. Could he have been murdered for reasons related to Japan's Unit 731? Again, unlikely as everyone outside the US Army in Tokyo knew about the program. If it wasn't any of this, what killed Cyril Wild? What led to *speedo*?

No reason other than the needs of the Japanese army in Burma has ever been given. The needs of Japan's atomic energy and weapons program could have, however, also been the cause of *speedo*. In April 1943, the Japanese need for a steady supply of "uranium-bearing ores" would have been enormous. The goal of building an ordinary railroad was scaled back. The altered plan now called for the construction of a light rail system by August 1943.[250] The loss of Thai support for the Japanese effort against the Allies following the Ban Pong Incident may have also contributed to the initiation of the *speedo* campaign. *Speedo* began four months after the Ban Pong Incident.[251]

Roads and Reasoning

The *speedo* period is attributed by most historians to a desire upon the part of the Japanese Army to complete the railroad on the updated August 1943 schedule in order to support their planned 1944 invasion of India, but this line of reasoning does not stand up to close scrutiny. When the Japanese invaded Burma, the spearhead of their invasion, the Japanese Fifteenth Army, moved through Thailand into Burma along a network of secondary roads located north of Bangkok. Before the railway was completed, Japan used these roads to support its troops in Burma.[252] The 15th Army quickly moved to secure Rangoon. Once Rangoon was secured, the Allies believed the Japanese advance would slow; instead, it gained speed. Forgotten in all the postwar revelations about the wartime suffering of the POWs is the importance of Thailand's preexisting road networks into Burma. Throughout the war, the Japanese Army worked to improve the roads along the Thai-Burma border that it had initially used to invade Burma. The Japanese Army later used these roads to support the construction of the rail line, moving rails and other such materials up the line to the area where needed. The British effectively quit Burma at the end of May 1942.

From May 1942 through October 1943, the Japanese Army occupied all of Burma and parts of India (the Andaman and Nicobar Islands), and had survived the advance into Burma and subsequent occupation of the country without the railroad. Despite the loss of shipping, the Japanese Army had had 17 months to build up stockpiles of food, ammunition and other stores prior to their anticipated operations against the British in India. As the rail line was being built, roads entering Burma lay alongside the track and were used to carry materials from Thailand into Burma. During some of the construction period, the Kra Isthmus Railway was also in use, providing the same safety to shipping that would be later be provided by the Thai-Burma Railway which should have allowed even more men and supplies to enter Burma.

The Japanese had also partially completed a supply road from Changmai, the capital of north Thailand into northern Burma. The road network is alternatively known as "*Japan's Burma Road*," but more accurately described as the Chiangmai-Burma Road.[253] During the war, the road was funded in-part by the Thai government. In 1943, the Thai government allocated 20.4 million baht to the project.[254] The Chiangmai-Burma road was intended not only to back up Japan's wartime occupation of Burma but also to supply the Japanese army in its planned Imphal Campaign, an attack into North-East British-occupied India overland from Burma.[255] As materials went into Burma, surely empty trucks did not return. On 18 January 1944, in a meeting of Rangoon merchants, Burmans petitioned to be allowed use certain railway stations in Upper Burma for transport of good southward. Their assumption was that freight cars would be returning empty after carrying military supplies up-country.[256] Apparently, they weren't.

Though the Chiangmai-Burma Road was incomplete at the end of the war, its cuttings and dirt path were indeed used to haul supplies into Burma. The reportedly incomplete road allowed large numbers of Japan's subsequently decimated forces in Burma to retreat into Thailand after their disastrous defeat at the Battle of Imphal-Kohima in July 1944. Bad news was all around. The Battle of Imphal-Kohima ended on the 3rd of July 1944. Saipan fell six days later. The Tojo Cabinet collapsed on 22 July. The Thai Cabinet collapsed later that same day.

The rail would be completed only five months before the Japanese invasion of India and the Battle at Imphal. Completing the project several months earlier than the originally-planned October would have allowed even greater stores of materiel to be on-hand prior to the invasion of India. However, an ever-larger number of workers would have been required, and could have been supplied, but never were. In the end, prisoner and slave labor were just never enough to serve the needs of the offensive, the Japanese plan of using the

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[248] The murder of Colonel Cyril Wild. FEPOW Community. 24 May 2020. https://www.fepow-community.org.uk/monthly_Revue/html/colonel_wild.htm
[249] JUDGMENT INTERNATIONAL MILITARY TRIBUNAL FOR THE FAR EAST. PART B - CHAPTER VII and PART B - CHAPTER VIII. CONVENTIONAL WAR CRIMES (Atrocities). THE PACIFIC WAR. November 1948
[250] Kratoska, Paul H. The Thailand-Burma Railway, 1942-1946: Documents and Selected Writings. Routledge. 2005
[251] NOTES ON THE THAI-BURMA RAILWAY, PART 5: "AN APPALLING MASS CRIME" Journal of Kyoto Seika University No. 22 http://www. kyoto-seika. ac. jp/event/kiyo/pdf-data/no22/david.pdf
[252] JAPAN'S "BURMA ROAD;" Reflections on Japanese Military Activities in Northern Thailand. https://www. kyoto-seika. ac.jp/event/kiyo/pdf-data/no18/David.pdf
[253] JAPAN'S "BURMA ROAD;" Reflections on Japanese Military Activities in Northern Thailand. https://www. kyoto-seika. ac.jp/event/kiyo/pdf-data/no18/David.pdf
[254] JAPAN'S "BURMA ROAD;" Reflections on Japanese Military Activities in Northern Thailand. https://www. kyoto-seika. ac.jp/event/kiyo/pdf-data/no18/David.pdf
[255] JAPAN'S "BURMA ROAD"; Reflections on Japanese Military Activities in Northern Thailand
[256] ARMY SERVICE FORCES MANUAL M354-18A CIVIL AFFAIRS HANDBOOK JAPANSECTION 18A: JAPANESE ADMINISTRATION OVER OCCUPIED AREAS-BURMA. HEADQUARTERS, ARMY SERVICE FORCES. 2 AUGUST 1944

route to send supplies to the troops advancing into the Burma-India border area, and being counterattacked by the British.[257] Japan's struggle for Burma required a flow of arms and supplies far larger than its merchant marine could provide.[258]

During *speedo* on the Thai-Burma Railroad, prisoner overseers appear to have lost any sense of human suffering. From April on, no days off were allowed – all prisoners would work, including the sick, unless they were too sick to move. The brutality of the guards steadily increased as they too came under intense pressure to hasten the work.[259]

Throughout the *speedo* period of rail construction, Allied POWs and Asian laborers were forced to work near non-stop to complete the rail. Hellfire Pass in the Tenasserim Hills was a particularly difficult section of the line to build due to it being the largest rock cutting on the railway, coupled with its general remoteness and the lack of proper construction tools during its construction. Australian, British, Dutch, other allied prisoners of war, along with Chinese, Malay, and Tamil laborers using hand tools, were forced by the Japanese to complete the cutting. Sixty-nine men were beaten to death by Japanese guards in the twelve weeks it took to build; many more died from cholera, dysentery, starvation, and exhaustion. During *speedo*, numerous Japanese soldiers, mostly guards, were also press-ganged to work constructing the line.

Japanese guards and engineers pushed their workers to unbearable limits, driving them to exhaustion with 16- or even 18-hour workdays. While thousands of POWs and *romusha* died during this ultimate drive to complete the rail, hundreds – perhaps more than 1,000 – Japanese soldiers also died. If it was not the supply of forces in Burma, what drove the Japanese to such ghastly lengths to complete the line? That the speedo period coincided with the onslaught of the yearly monsoon made working conditions even more horrific. The *speedo* construction period is often attributed to the defeat of the Japanese Imperial Navy at the Battle of Midway and Japan's declining naval power after the battle. However, the *speedo* period began nearly a year after the Battle of Midway.[260] Ironically, rather than supplying victorious Japanese campaigns, the Thai-Burma Railroad, Mergui Road, and the Chiangmai-Burma Road became the chief routes of retreat or escape for the badly-battered Japanese soldiery.[261]

Completion

On 17 October 1943, two months ahead of schedule, construction gangs in Burma working south met up with construction crews in Thailand driving north. The two sections of the line met at kilometer 263, about 11 miles (18 km) south of the Three Pagodas Pass at Konkuita (Kaeng Khoi Tha, Sangkhla Buri District, Kanchanaburi Province). On 25 October 1943, as a small military band struck up *Kimigayo*, the Japanese national anthem, Commanding Lieutenants Sasaki and Imai ceremoniously drove the last spike of the rail junction some 40 miles from the Burmese border. Work continued for the prisoners and *romusha* until January 1944 to finish the details such as evening out the rail bed due to shifting ballast.[262] By the end of 1943, in the first two months of operation, 12,000 tons of essential supplies were transported by the railway into Burma. 5,000 tons of this went to the Myitkyina line to supply the three divisions which were to advance on Imphal before the operation started on 8 March 1944.[263]

As the rail line began to enter service, the Japanese realized much to their chagrin, that in completing the rail line they had simply created a large target subject to near constant attack by Allied strategic air forces.[264] The rail line was one of the few strategic targets in the area worthy of attack by long-range Allied bombers. After its completion, the 5th and 9th Railway Regiments, along with the JNR, worked to keep the trains running on the Myitkyina line and on the Burma-Thai rail line in the face of the persistent demolition of the bridges and facilities by British and US war planes, to transport Japanese troops and their essential supplies to terminal stations.[265]

As opposed to popular myth, the rail line was not simply a one-track line between two points in Southeast Asia. The line possessed numerous rail sidings, repair yards, rail-transfer-points, turning wyes, turntables, cut outs, caves and other features that allowed it to remain in operation despite Allied bombings. It was obviously more important than simply a construction project.

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[257] Kiattisahakul, Puengthip. Assistant Professor, Faculty of Arts, Silpakorn University. Part Three: Economic and Cultural Issues. The Japanese Army and the Control of Southern Thai Railways, 1941-1945

[258] Hornfischer, James D. In the Jungle of the Kwai - Ship of Ghosts: The Story of the USS Houston, FDR's Legendary Lost Cruiser, and the Epic Saga of Her Survivors. New York. Bantam. 2007

[259] The Adventures of Eddie Fung: Chinatown Kid, Texas Cowboy, Prisoner of War, edited by Judy Yung. University of Washington Press. 2007

[260] Lim, Lisa. 1943-Death Railway. Ministry of Defence: Singapore. Volume 5, Issue 10. 7 October 2001. http://en. wikipedia. org/wiki/Death_Railway

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[264] Henderson William A. Lt. Col. USAF Ret. DESPERATE SURVIVAL ON THE RIVER KWAI. Bridge Over the River Kwai. CHINA BURMA INDIA to the KWAI. http://www. mekongexpress. com/thailand/photoalbum/bridgechapt8. htm

[265] Tamayama, Kazuo. Railwaymen in the War. Tales by Japanese Railway Soldiers in Burma and Thailand 1941–47. PALGRAVE MACMILLAN. New York. 2005

In Operation

Tall tales aside, the railway was far more solidly constructed than is generally believed. There were few, if any, actual collapses of the line due to shoddy construction. For the most part, rail line ballast rarely failed. There are no known collapses along the line during its period of operation that can be directly attributed to prisoner efforts to undermine the rail line's construction.[266] Discounting bombing and seasonal floods, heavy use was responsible for most known collapses and other incidents where a train is known to have left the track.

Despite reports of locomotives and railcars destroyed, the rail was so secure that it operated locomotives on a regular schedule.[267] At a minimum, a total of eight "slow moving" military trains operated along the line daily – four from Burma, four from Thailand.[268] At times, the number of military trains operating each way could reach as high as six trains. In addition to the normal military trains, there were also "fast running diesel specials and priority trains."[269] These "fast running diesel specials and priority trains" operated primarily from Burma into Thailand.[270] The exact purpose of these "fast running diesel specials and priority trains" is not known.[271] Trail schedules were prepared by the Thai National Railway.[272] It is not exactly clear which element of the Japanese government actually operated the "fast running diesel specials and priority trains" other than it was not the Japanese Army. There were also "train-trucks" moving men and material along the line. These train trucks were designed by the Japanese to run on the rail. At least six were in use on the railway, particularly during the early stages of construction. All were exported from Japan to Thailand and Burma.[273]

During the war, a large portion of the rail's rolling stock and locomotives were reportedly destroyed. In the last half of 1943, at least 150 locomotives were reportedly attacked and destroyed.[274] During daylight hours, it is reported that few trains moved at all. In some cases, it was reported that transit across the line from Burma to Thailand could take as much as one month. According to the USSBS, a postwar bombing survey conducted by the Army Air Force, wartime bombing had disrupted 65 percent of Burma's road and railway system.[275] Despite the attacks, despite the destruction, the Japanese kept the line open. How and why?

Most likely the rail line was less often disrupted by Allied bombing than is generally admitted. The Allies did not make their first concentrated effort to destroy the bridges, rail junctions, and marshaling yards along the Kwae Noi, until the latter part of 1944.[276] The rail line's numerous bridges only became true targets with the use of the ASM-N-2 Bat with modified radar systems (SWOD Mark 9 Model 1). Prior to use of the Mark 9, numerous attacks were required to actually collapse one bridge.

Simultaneously though, by late 1944, Japan's requirements for uranium-bearing ores shipped to Japan Proper had apparently lessened as sufficient ores appear to have been stockpiled on the main islands,[277] Korea,[278] and possibly Manchukuo. In May 1945, command of all Japanese railway was transferred to the Thailand Garrison Army under Lt-Gen. Nakamura.[279] The railway continued to operate, with some interruptions, until the final victory of Allied forces in August 1945.

> *"Medical supplies were meagre. Although no deaths occurred among prisoners of war at this camp, of the total of about 1000 men who set out from Nakompaton to build the road, about 250 died in four months owing to the lack of medical supplies, overwork, inadequate food and the disgraceful living conditions."*
>
> Major Vincent Bennett: Affidavit - Exhibit No. 1585-A[280]

> *"Six weeks ago, another N. C. O. and I were digging graves at the rate of five daily in a camp of 300 Australian, English,*

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[266] A Brief History of the Thailand-Burma Railway. http://www.hintokcamp.com/Package/IN-ROOM%20BOOK%20(HINTOK%20RIVER%20CAMP%20@%20HELL%20FIRE%20PASS).pdf
[267] The Rail Road and Ore Shipments. E-mail between Dwight Rider and Rod Beattie, The Director of the Japan, England, America, Australia, Thailand and Holland (JEATH) War Museum at Kanchanaburi, Thailand. 23 July 2008
[268] NA. Bo. Ko. Sungsut (Supreme Command Headquarters), 2. 4. 1/5 Khosanoe kandoen rot khabuan thahan Yipun ok nok khetdean Thai [Proposal on opening a railway for Japanese military trains to cross the Thai border], 20 April 2485 (1942)
[269] NA. Bo. Ko. Sungsut (Supreme Command Headquarters), 2. 4. 1/5 Khosanoe kandoen rot khabuan thahan Yipun ok nok khetdean Thai [Proposal on opening a railway for Japanese military trains to cross the Thai border], 20 April 2485 (1942)
[270] NA. Bo. Ko. Sungsut (Supreme Command Headquarters), 2. 4. 1/5 Khosanoe kandoen rot khabuan thahan Yipun ok nok khetdean Thai [Proposal on opening a railway for Japanese military trains to cross the Thai border], 20 April 2485 (1942)
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[279] Reynolds. Bruce E. International Orphans': The Chinese in Thailand During World War II. Journal of Southeast Asian Studies. 1997
[280] Winstanley, Peter. Lt Col OAM RFD JP. MAJOR VINCENT BENNETT - ROYAL ARMY MEDICAL CORPS 67846. www. pows-of-japan. net

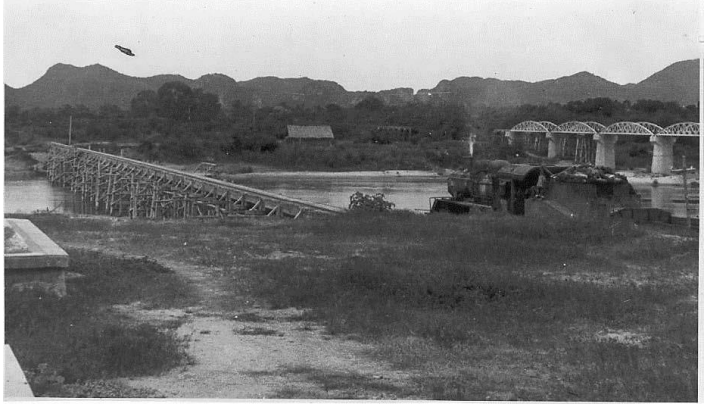
American and Dutch prisoners of war, on a new jungle road, which we constructed from Kerikan on the Gulf of Siam to Mergui, Burma."

Sgt. F. F. Foster, VX391S2.[281]

The Mergui Road

April 1945 saw the beginning of construction on the Mergui Road between Prachuap Khiri Khan on the east coast of Thailand and Mergui on the west coast of Burma. Prisoners that survived the war were still working on the road when the Japanese surrendered on 15 August 1945.[282] Of all Japan's wartime transportation projects to open land routes into Burma from Thailand, the conditions under which the POWs and *romusha* on the Mergui Road were the most horrific.[283] By 25 April 1945, over 33% of the men were reported as sick; by 4 May over 50% of the men were said to be ill.[284] Of the 984 known to be in the area (after taking into account those who had been evacuated as sick back to Nakon Paton) at the end of the war in August 1945, 264 had died and 720 survived.[285] Perhaps because there were far fewer POWs on this project than the Thai-Burma Railway, far less is known about the Mergui Road. Of all Japan's wartime transportation projects, the Mergui Road is the least well-remembered.

Approximately fifty per cent of the 1,011-man work force was selected from hospital patients held at Nakom Pathon, Thailand, by a Japanese medical officer who showed no concern for the prisoner's physical condition.[286] The prisoners were told that they were needed for light work in Malaya. Most of the prisoners at Nakom Pathon who had worked for the last 12 to 18 months on the Thai-Burma Railway were very ill and undernourished, but they perceived Nakom Pathon as a place of death and many wanted to leave.[287] Hospitals were simply a place to die. This false promise of the Japanese of light work was just another lie. The work force was for the construction of the Mergui Road; the road was to be constructed over a mountainous region between Mergui in Burma and Prachuap Khiri Khan in Thailand. The road was being built as an escape route for their armies in Burma to escape into Thailand.



The Japanese accomplished the job by creating groups of about 200 POWs to cut a route 3 yards wide and 15 kilometers long, and then leapfrogging another group ahead to cut the next 15 kilometers.[288] The groups working were sent forward with no food or medicine.[289] They slept beneath rice sacks under the open sky with no protection from the elements. Diarrhea and dysentery were second only to malaria as a cause of illness and death. It should be remembered, however, that sick men were given less food than those who worked, and that much of the food was of inferior quality when issued. The Japanese were now retreating from Allied forces in north Burma and the tide was turning with allied naval fleets making their presence known."[290]

Surrender

On 15 August 1945 Japan surrendered. POWs and *romusha* heard the news mainly through the grapevine; not all camps heard the news at the same time. Some of the Japanese camp commanders fearing reprisals were reluctant to inform the POWs they were free. POWs on the Mergui Road eventually heard the news that war with Japan had ended on 18 August 1945. As one POW working the on Sumatra Railway on the last day of his war recalled:

"*All of a sudden we were allowed out of camp. I walked to a post office Pakan Baru and asked the crazy question whether I could send a telegram to my wife in Java. And, strange as it may seem, I was able to for 10 cents per word. The Japanese were extremely jumpy and when they had burnt all papers relating to the camp they asked us if we thought that they should commit suicide.*

Our answer was: 'Yes, as your tradition harakiri lays down, that's the best thing you could do.'"[291]

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[281] JAP SADISM ON MERGUI ROAD. Allied POWs Called It "Valley of Death." 260 POWs Died in Last Twelve Weeks. VX391S2 Sgt. F. F. Foster, an Australian who was captured in Java, exposes the recent Mergui Road POW tragedy in the following story written specially for The "Rangoon Liberator"

[282] Winstanley, Peter. Lt Col OAM RFD JP. MAJOR VINCENT BENNETT - ROYAL ARMY MEDICAL CORPS 67846. www.pows-of-japan.net

[283] Winstanley, Peter. Lt Col OAM RFD JP. MAJOR VINCENT BENNETT - ROYAL ARMY MEDICAL CORPS 67846. www.pows-of-japan.net

[284] Winstanley, Peter. Lt Col OAM RFD JP. MAJOR VINCENT BENNETT - ROYAL ARMY MEDICAL CORPS 67846. www.pows-of-japan.net

[285] Winstanley, Peter. Lt Col OAM RFD JP. MAJOR VINCENT BENNETT - ROYAL ARMY MEDICAL CORPS 67846. www.pows-of-japan.net

[286] Winstanley, Peter. Lt Col OAM RFD JP. MAJOR VINCENT BENNETT - ROYAL ARMY MEDICAL CORPS 67846. www.pows-of-japan.net

[287] Winstanley, Peter. Lt Col OAM RFD JP. MAJOR VINCENT BENNETT - ROYAL ARMY MEDICAL CORPS 67846. www.pows-of-japan.net

[288] BRITAIN AT WAR. PART EIGHT. NAKOM PATON (Nakhon Pathom) 1944 – 1945. 5/1/2020 https://www. far-eastern-heroes. org. uk/freeing_the_demons/html/nakom_paton. htm

[289] JAP SADISM ON MERGUI ROAD. Allied POWs Called It "Valley of Death." 260 POWs Died in Last Twelve Weeks. VX391S2 Sgt. F. F. Foster, an Australian who was captured in Java, exposes the recent Mergui Road POW tragedy in the following story written specially for The "Rangoon Liberator"

[290] Mergui (Myiek) - Prachuab Kirikhan Escape Road – Thailand. 2/4th Machine Gun Battalion Ex Members Association 2020. http://2nd4thmgb. com. au/camp/mergui-myiek-escape-road-thailand/

[291] SUMATRA 'DEATH RAILWAY' https://www.cofepow.org.uk/armed-forces-stories-list/sumatra-death-railway

In 1945 as the British pushed Japan out of Burma, the majority of Japan's military forces escaped Burma using the area's cross-border roads, especially in the area of Chaingmai. Few escaping soldiers actually rode the Thai-Burma Railway out of Burma. Those that did ride out were usually bloodied and badly wounded. However, even in retreat the line was continuously maintained. After the devastating defeat of the Japanese 15th Army in the Imphal area in brutal hand-to-hand fighting, the 5th Railway Regiment retreated from the Myitkyina line to Mandalay and then south to the Sittang River, fighting rearguard actions.[292] It was only during this retreat that Ba-Maw and other fleeing officials of the Japanese-installed puppet government, the State of Burma, saw firsthand the completed railway. Ba-Maw later wrote: "It was in June 1945 that I actually saw the railway for the first time when I visited Thanbyuzayat, the Burma terminus, and only in August of that year that I travelled on it when, after the Japanese surrender, I fled by that railway to Thailand on my way to Japan. With a remnant of the Burmese government, I had joined in the retreat from Rangoon in April, and so reached Mudon, in Moulmein District, some miles from Thanbyuzayat…"[293]

Ba Maw continued: "On August 15, 1945, I took this train to Thailand, and so was able to see for myself the railroad all the way. A long, wide stretch of jungle had been cleared and made fit for human habitation. As for the railway itself, it was in its way a marvel. The tracks, which had been laid by men labouring under the most dangerous possible conditions, kept firm and smooth throughout in spite of the violent kamikaze speed at which a badly-battered engine was taking us, for the Japanese were racing against time at that juncture. The bridges were constructed of wood and bamboo, often held together by wire or ropes or even thongs in places. Some of the longer bridges skirting and in places precariously overhanging the gorges or steep river banks were simply breath-taking, and so were the sharp bends and climbs and loops that our train took most cheerfully and without even seeming to slow down. This journey will remain as one of the deepest experiences of my life."[294]

The rail was maintained up to the end of the war, and past the need of Japan's forces in Burma as an escape route out of the county. Through 1944, the rail line achieved its purpose – whatever that purpose really was. When the British overran Burma in 1944, far more Japanese soldiers escaped via the improved road network in upper Burma than along the Thai-Burma Railroad. The Burma area was, of course, of secondary importance to the defeat of Japan. It was simply a matter of time before Japan was defeated. Operations in Burma did not advance or hasten Japan's defeat to any appreciable degree.[295]

Postwar deals by American, British and Australian for access to resources and knowledge, such as the US deal with General Ishii Shiro at bargain basement prices for access to Japan's biological warfare secrets, also cloud researcher efforts to decipher Japan's wartime atomic weapons and energy research program. That the British Americans, Australians, Chinese and Philippines held additional war crimes trials throughout areas under their control after the war, where the atrocities occurring in their countries during wartime and of the Thai-Burma Railway were covered in-depth, may be the reason why the subject was never broached by the court in Tokyo.

> *But with the defeat of the Japanese, (the railway) vanished forever and only the most lurid wartime memories and stories remain. The region is once again a wilderness, except for a few neatly kept graveyards where many British dead now sleep in peace and dignity. As for the Asians who died there, both Burmese and Japanese, their ashes lie scattered and lost and forgotten forever.*
>
> Ba Maw in his diary, "Breakthrough in Burma" (Yale University, 1968)

In the postwar era, it was openly admitted that Japan had sought radioactive ores in Malaya and Sumatra: "The placer tin deposits of the Malay Peninsula Burma, and Thailand contain considerable monazite, but generally it has not been recovered in the tin mining. Monazite rarely makes up as much as 50 percent of the heavy sands at Kuala Trengganu on the east side of Malaya. Malayan monazite resources probably are greater than those of Burma, Thailand, or Indonesia. Malayan monazite contains 3.4 to 9.4 percent Th_{02} and is therefore a richer source for thorium than the Indonesian mineral. It is likely that 100 to 200 tons of Th_{02} passes through Malayan tin-concentrating plants annually. A small amount of monazite is reputed to have been produced in 1914 at Sungei Badang in the Gambang placer tin field in Pahang, and about 1930, some mixed concentrates containing monazite were shipped. During 1944 and 1945, the Japanese in Malaya produced 220 tons of monazite and 200 tons of a mixed monazite-zircon concentrate from Cassiterite tailings. In the Ulu Sempan area of Pahang, Malaya, placer concentrates contain columbite and monazite. In the Puket-Pangnga region of Thailand, the tailings from tin mining also have uranium- and thorium-bearing niobates and titanates such as euxenite and brannerite."[296]

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[292] Tamayama, Kazuo. Railwaymen in the War. Tales by Japanese Railway Soldiers in Burma and Thailand 1941–47. PALGRAVE MACMILLAN. New York. 2005
[293] Ba-Maw. Breakthrough in Burma. Memoirs of a Revolution, 1939-1945. Yale University Press. New Haven. 1968
[294] Ba-Maw. Breakthrough in Burma. Memoirs of a Revolution, 1939-1945. Yale University Press. New Haven. 1968
[295] CSI BATTLEBOOK. Imphal-Kohima. Combat Studies Institute. Fort Leavenworth, Kansas
[296] Geologic Distribution and Resources of Thorium by J. C. OLSON and W. C. OVERSTREET GEOLOGICAL SURVEY BULLETIN 1204 Prepared partly on behalf of the U. S. Atomic Energy Commission. UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON: 1964. https://pubs.usgs.gov/bul/1204/report.pdf

Impressively, the State of Burma and its army revolted against the Japanese Imperial Army on 27 March 1945. The revolt was accompanied by declaration of war against Japan issued by the State of Burma. Postwar, the construction of the Burma Railway was considered a war crime.

War Crimes

The estimated total number of civilian laborers and POWs who died during construction varies considerably, but the Australian Government figures suggest that of the 330,000 people that worked on the line (including 250,000 Asian laborers and 61,000 Allied POWs), about 90,000 of the laborers and about 16,000 Allied prisoners died.[297] The dead included 6,904 British personnel, 2,802 Australians and 2,782 Dutch. Of the 668 US personnel forced to work on the railway, 133 died. Included were personnel from *USS Houston* and the 131st Field Artillery Regiment of the Texas Army National Guard. The Americans were called the *Lost Battalion* as their fate was unknown to the United States for more than two years after their capture. It was not until 15 September 1944 that the fate of the *USS Houston* and the *Lost Battalion* were revealed, when the *USS Pampanito*, an American submarine that had spent the night before sinking Japanese cargo ships to include the *Rakuyo Maru*, rose to the surface to capture a few Japanese for interrogation and found itself surrounded by waves of POWs who had slaved on the Thai-Burma Railroad. Though four other submarines rushed to the area to save POWs, only 159 of the *Rakuyo Maru's* 1,318 prisoner-passengers could be carried aboard the subs. Those survivors provided the first reporting of the fate of the Americans thrown into the war in 1941.

After World War II, more than one thousand Japanese railway officers and soldiers were arrested on suspicion of being war criminals and were imprisoned at Changi and Rangoon, where they were treated harshly with starvation rations for over a year. Postwar, it seems that the Allies only cared about trials for Japan's former members of its military police – the Kempeitai.[298] Standard procedure in British investigations required the automatic detention of prison and camp staff along with members of the Kempeitai.[299] British authorities, re-engaged in Burma, decided not to prosecute Burmese who had aligned themselves with the Japanese, to include those who had committed treason or were involved in war crimes.[300] The decision allowed Japan's wartime interest in Burma's uranium to escape investigation. Few of the Japanese involved with the construction of the Death Railway would have known the purpose or value of any ores shipped over the line anyway.

Altogether British authorities in Burma conducted 40 war crimes trials indicting 136 former members of the Japanese armed forces. Most of those tried were Kempeitai accused of crimes against Burmese. Seven railway officers and eight JNR men were prosecuted in the military war crimes courts to include Major-General Sasa, who commanded the railway, and Captain Hirota, a platoon leader, were hung. A total of 89 Japanese officers, guards and military police in charge of POW camps were prosecuted; 43 of them were hanged.[301] It is unlikely that any of these men would have known anything about Japan's wartime atomic energy and weapons research. Finally, the majority of trials associated with the Thailand-Burma Railway trials took place in Bangkok and Singapore, further removing wartime events occurring in Burma from investigation.[302] By 1948, US and other geologists were publishing in open-press information about Burma's uranium, thorium and other radioactive materials. If the presence of such ores in Burma was not widely known before the war, it was now.

Altogether, though, in looking back at the construction of the Burma railway – the lives, the costs, the disease, its construction during wartime – it was an impressive accomplishment. Of the railway, Ba-Maw later wrote: "I have told the Burmese side of the story. None of us here really knew how the railway was being constructed in Thailand, or the nature of the labour employed there, or the labour conditions. Remembering our own experience in Burma, it is easy to believe that there must have been an enormous toll in human life and suffering in many labour camps elsewhere, too. But on the other side of the picture, there was an enormous gain as well – the conquest of a vast jungle frontier which had kept two neighbouring peoples apart since time began – and this in the long reckoning of history might well be judged as outweighing everything else. If we take that historical view, it will be seen that few enterprises during the whole war showed more essential vision than the construction of this railroad. But with the defeat of the Japanese, it vanished forever, and only the most lurid wartime memories and stories remain. The region is once again a wilderness, except for a few neatly kept graveyards where many British dead now sleep in peace and dignity. As for the Asians who died there, both Burmese, and Japanese, their ashes lie scattered and lost and forgotten forever."[303]

Postwar, an American engineer said after viewing the project:

> *"What makes this an engineering feat is the totality of it, the accumulation of factors. The total length of miles, the total number of bridges — over 600, including six to eight long-span bridges — the total number of people who were involved (one-quarter of a million), the very short time in which they managed to accomplish it, and the extreme conditions they accomplished it under. They had very little transportation to get stuff to and from the workers, they had almost no medication,*

[297] Gamba, C. The National Union of Plantation workers: The History of the Plantation Workers of Malaya, 1946-1958. John T & Pearl Lewis. Cornwall, UK. 1962. p. 13
[298] von Lingen, Kerstin. Editor. The Burma Trials of Japanese War Criminals, 1946–1947. Justice in Time of Turmoil. Palgrave Macmillan. November 2016
[299] BOR, IOR/M/4/3043: Japanese War criminals – miscellaneous, ALFSEA, 'War crimes: Summary of investigations in 1945' [n.d.]
[300] von Lingen, Kerstin. Editor. War Crimes Trials in the Wake of Decolonization and Cold War in Asia, 1945–1956. Justice in Time of Turmoil. Palgrave Macmillan. Cham, Switzerland. 2017
[301] Tamayama, Kazuo. Railwaymen in the War. Tales by Japanese Railway Soldiers in Burma and Thailand 1941–47. PALGRAVE MACMILLAN. New York. 2005
[302] von Lingen, Kerstin. Editor. War Crimes Trials in the Wake of Decolonization and Cold War in Asia, 1945–1956. Justice in Time of Turmoil. Palgrave Macmillan. Cham, Switzerland. 2017
[303] Ba-Maw. Breakthrough in Burma. Memoirs of a Revolution, 1939-1945. Yale University Press. New Haven. 1968

> *they couldn't get food let alone materials, they had no tools to work with except for basic things like spades and hammers, and they worked in extremely difficult conditions — in the jungle with its heat and humidity. All of that makes this railway an extraordinary accomplishment."*[304]

It has been nearly 80 years since construction began on the Thai-Burma Railway. Just because we don't know, doesn't mean that they didn't. I wonder what they used it for.

[304] "The Bridges of the Thai Burma Railway." Secrets of the Dead: Unearthing History. Public Broadcasting System. Retrieved 8 January 2015

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