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PHYSICAL REMINDERS OF THE BRITISH–JAPANESE ARMAMENT TRADE IN MICRONESIA

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Many of the islands of Micronesia show traces of Japanese military fortifications, and in recent years efforts have been made to document these historical resources and to develop conservation management plans for them. The identification of the guns has shown that many of the coastal defense guns emplaced on Japanese bases in Micronesia are not of Japanese manufacture, but are of British origin; some are even of Italian production. The following article intends to shed some light on the issue where the guns came from, and how they got to Micronesia.

The heavy coastal defense guns on the Japanese bases in Micronesia can stem from a number of sources:

- During the late 1880s until the 1910s Great Britain provided military assistance to Japan and sold several naval guns to that country. Several of these guns were then removed from old warships dismantled under the Naval Tonnage Limitation Treaty in 1922. Rather than being destroyed, the guns were mothballed for use as coastal defense guns.
- After World War I and the signing of the Naval Tonnage Limitation Treaty, the military cooperation between Japan and the United Kingdom ended as far as the export of guns was concerned. However, the Japanese operated a joint British–Japanese armament factory which was licensed to use the Vickers-Armstrong design and produced gun barrels and guns of the same type.
- Furthermore, during World War II and the fall of Singapore and Hong Kong a number of guns, which had fallen into the hands of the Japanese, were relocated to some of their bases under then construction.

It is hardly surprising, that in the popular literature the notion prevails that these guns stem from the British bases at Singapore or HongKong, and that the Japanese moved these guns after the bases had fallen into their hands.

In reality, none of the guns emplaced in Micronesia came form such sources, but are guns of World War I vintage, purchased from British armament manufacturers as part of warships ordered, or manufactured under British license in Japan. In the following we will investigate these issues, as they not only have a bearing on the interpretation of the guns pres-

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ent in Micronesia, but also are crucial for the assessment of their historical and social significance.

Based on the breech block numbers identifying the gun barrels as to their manufacture and thus history, it is, at least in theory, possible to track the guns. The breechblock numbers of several guns were therefore duly noted. On the whole, the gun mounts seem to have more Japanese characters than the breech block, indicating that the mount may have been produced in Japan, after the gun barrel had been removed from the ship.

THE JAPANESE SHIP BUILDING PROGRAMME IN THE UK

The Imperial Japanese Navy, following centuries of self-imposed isolation, showed in the 1895 Sino-Japanese war that it was a respectable fighting force (Jane 1904). By the same token, it had become apparent that the quality of the naval vessels was sufficient in combat against the Chinese, such as at Yalu and Weiha-wei, but that the capacity of the fleet was insufficient to meet another potential enemy, Russia.

As a result of the Sino-Japanese war the Japanese navy decided to step up ordering ships from what was at the time the country with the most advanced navy and the most advanced dockyards: the United Kingdom. The ship building programme had already begun a few years earlier, but was substantially intensified following the conflict, with the order of four battleships. The first British–built ships of the Japanese Navy were the *Fuso* (launched 1877), the *Kongo* (launched 1877) and the *Hiei* (launched 1878) (Jentschura *et al.* 1977:13). Before these orders in the United Kingdom, Japan had ordered ships from France. However,

> *"about 1887 Japan definitely decided to draw all her Q.F. guns, 6 in. or 4.7in., from Elswick, and all heavy guns from Canet. Krupp's pieces were discarded. This resolution was adhered to until 1902-03, so far as Elswick was concerned, but Canet guns were given up some years ago. Elswick guns were, in 1890, shipped to France for the* Isukushima *and her sister ships. At present (1904) new guns are of the Vickers model" (Jane 1904:73).*

The first British–built ships of the Japanese navy were the *Fuso* (launched 1877), the *Kongo* (launched 1877) and the *Hiei* (launched 1878) (Jentschura *et al.* 1977:13).

Table 1 summarises the battleships built in British dockyards on Japanese orders. In addition, ships were built by a dockyard in Stettin (cruiser *Yakumo*) and a yard in St.Nazaire (*Azuma*). In addition, several ships were built in the Japanese dockyard at Yokosuka following European designs (such as the *Suma*). Six-inch guns were also installed on some protected cruisers of the improved *Suma* class, namely the *Niitak* and the *Tsushima*, both launched in 1902 and in the *Otawa*, laid down in 1903. The vessels carried six 6-inch each (Jane 1904:212).

Some of the vessels outfitted with British guns were lost in the Russian–Japanese war of 1905, others by accident. The *Yashima*, as well as the *Hatsuse* ran on 15 May 1904 in a minefield laid the day before by the Russian *Amur* 10nm NE Port Arthur, and sank (Jentschura *et al.* 1977:17-18). The *Mikasa* sunk at her moorings during the night 11/12 November 1905, following an ammunition and torpedo explosion. The vessel was raised on 7 August 1906 and repaired. The guns were removed and replaced with Japanese clones.

The last capital ship to be built outside of Japan was the *Kongo*, a battle cruiser built by Vickers & Sons at Barrow and launched in 1914. A sister ship, the *Hiei*, was built in Japan after British plans and using British gun mountings (Jentschura *et al.* 1977:33).

The United Kingdom's shipbuilding programme on behalf of the Imperial Japanese Navy has to be seen on the background of a large scale commercial naval building programme British naval dock yards undertook between 1890 and the beginning of World War I.

Table 1 Details of the Japanese battleship programme built in the United Kingdom

Ship	*Fuji*	*Yashima*	*Shikishima*	*Hatsuse*
Laid down	1894	1894	1897	
Launched	31 Mar 1896	28 Feb 1896	1-Nov-1898	27-Jun-1899
Completed	17-Aug-1897	9-June-1897	26-Jan-1900	18-Jan-1901
Disarmed	1922		1922	
Decommissioned	1-Sep-1922	15-May-1904 *)	1-Apr-1923	15-May-1904 *)
Shipyard	Thames Ironworks	Armstrong & Mitchell	Thames Ironworks	Armstrong & Mitchell
Armament by	Elswick	Elswick	Elswick	Elswick
Displacement	12,450	12,320	14,850	15,000
12" 40 cal	4	4	4 MkIX	4 MkIX
10"	—	—	—	—
6" QF 50 cal	—	—		
6" QF 40 cal	10	10	—	—
6" QF 45cal	—	—	14	14
12 pdr	—	—	—	—
3 pdr QF	20	20	6	6
2.5 pdr QF	4	4	6	6
4.7" QF 45 cal	—	—	—	—
3"	—	—	20	20

*) Both vessels ran on 15 May 1904 into a minefield laid the day before by the Russian *Amur* 10nm NE Port Arthur, and sunk.

Table 1 (ctd.) Details of the Japanese battleship programme built in the United Kingdom

Ship	*Asahi*	*Mikasa*	Elswick *Kashima*	battleship *Katori*
Laid down				
Launched	13-Mar-1899	8-Nov-1900	22-Mar-1905	4-Jul-1905
Completed	31-Jul-1900	1-Mar-1902	25-May-1906	20-May-1906
Disarmed	1922	1922	April 1922	April 1922
Decommissioned	24-Jul-1923	20-Sep-1923	1923	1923
Shipyard	John Brown, Clydebank	Vickers Maxim	Vickers, Barrow	Armstrong & Mitchell
Armament by	Elswick	Armstrong-Whitworth	Armstrong-Whitworth	Armstrong-Whitworth
Displacement	15,200	15,410	16,400	15,920
12" 40 cal	4MkIX	4 MkIX	4	4
10"	—	—	4	4
6" QF 50 cal	—		12	12
6" QF 40 cal	—	—	—	—
6" QF 45cal	14	14	—	—
12 pdr	—	—	16	12
3 pdr QF	6	6	3	3
2.5 pdr QF	6	6	—	—
4.7" QF 45 cal	—	—	—	—
3"	20	20	—	—

Table 2. Details of the Japanese Cruisers, Asama Class, built at Elswick in the United Kingdom

	Asama Class			
Ship	*Asama*	*Tokiwa*	*Izumo*	*Iwate*
Laid down	1896	1896	1898	1898
Launched	22-Mar-1898	6-Jul-1898	16-Sep-1899	29-Mar-1900
Completed	March 1899	April 1899	Sept 1900	31-Mar-1901
Decommissioned	1947	1947	1947	1947
Shipyard	Armstrong-Whitworth	Armstrong-Whitworth	Armstrong-Whitworth	Armstrong-Whitworth
Armament by	Elswick	Elswick	Elswick	Elswick
Displacement	9,750	9,700	9,750	9,750
12" 40 cal	—	—	—	—
8" ? cal	4	4	4	4
6" QF 40 cal	14	14	14	14
6" QF 45cal	—	—	—	—
3 pdr QF	12	12	12	12
2.5 pdr QF	7	7	7	7
4.7" QF 45 cal	—	—	—	—
3"	—	—	—	—

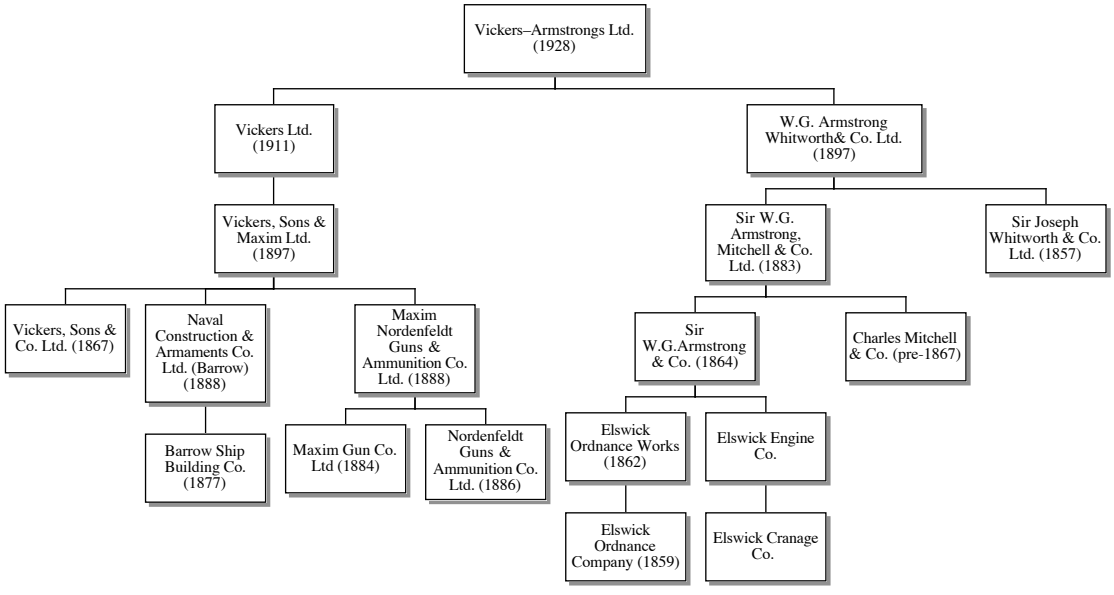

Figure 1. The merger history of W.G. Armstrong and Vickers

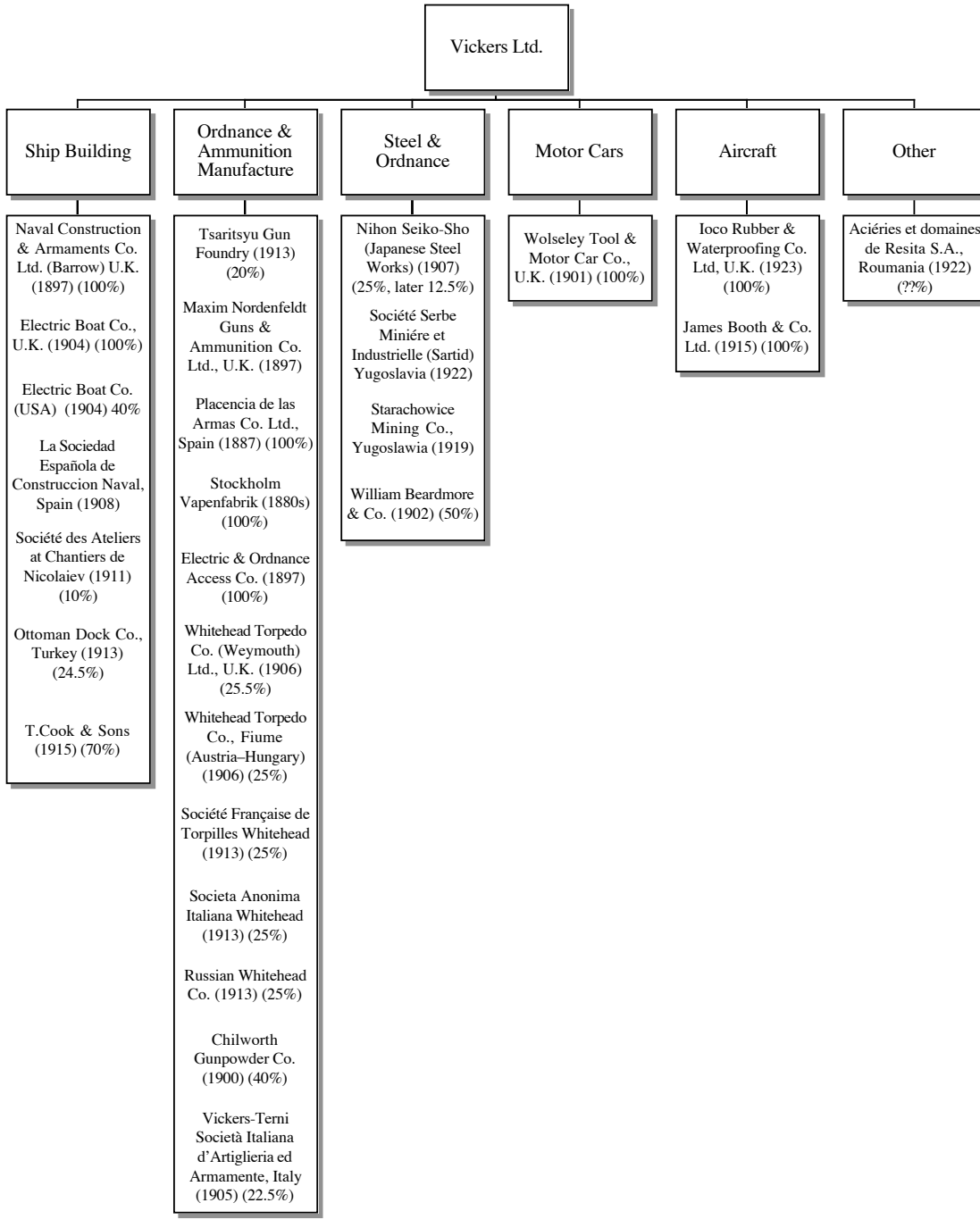

Figure 2 The Vickers Armaments Empire (up the merger with W.G.Armstrong in 1925)

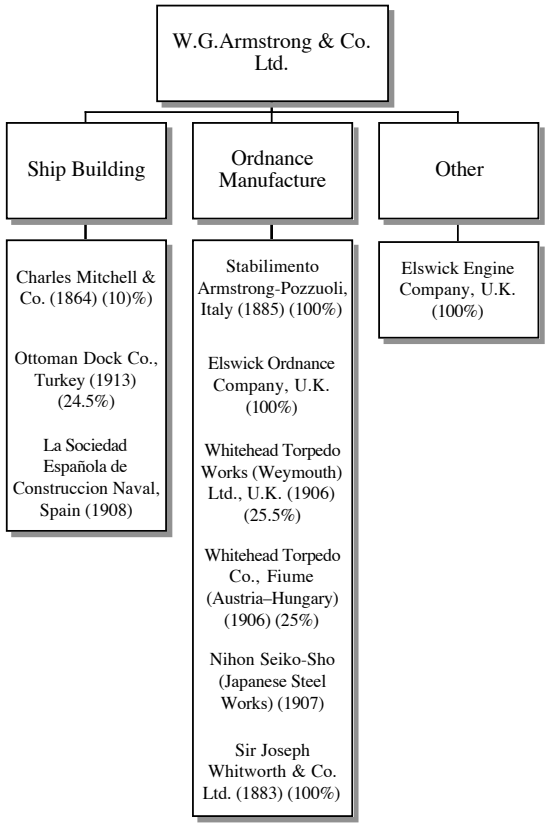

Figure 1 The W.G.Armstrong Armaments Empire (up the merger with Vickers in 1925)

Not counting construction for the British Navy, as well as for the British colonies, dependencies and dominions (Australia, Canada, New Zealand and so on), British yards, mainly Elswick (Armstrong-Mitchell / Armstrong-Whitworth), but also Vickers, Laird and Yarrow, built over two dozen fully equipped major fighting vessel—battleships or armoured cruisers—for the navies of Argentina, Brazil, Chile, China, Norway, Peru, Portugal, Rumania, and even Russia. Further, British Navy vessels were sold to Russia, and outdated warships of other countries were traded widely, which led to further proliferation of British–manufactured armament to Ecuador and Uruguay. In some cases British naval yards laid down ships on mere speculation for future sales. A case in point is the *Chacabaco*, laid down by Elswick in 1898 and finally sold to the Chilean Navy in 1902 (Jane 1990: 304). In addition, through the international subsidiaries, the British ordnance companies outfitted vessels for the navies of Greece, Italy and Spain. In addition, British-designed armament equipped the *Garibaldi* Class Cruisers, a successful Italian design manufactured 1897-1905, for the navies of Italy and the Argentine. Japan bought two ships, *Kasuga* and *Nisshin,* originally ordered by the Argentinean navy, guns of some of which are likely to have been emplaced on Chuuk (Truk).

Only the navies of the United States, France, Germany, Austria, Turkey, Holland and several Scandinavian countries did not obtain naval units or armament from British yards. This major export business came to a halt after World War I when the naval race had accelerated to such a degree that a reduction of naval powers had been proposed by a number of nations.

JAPANESE ORDNANCE COMPANIES

The data on Japanese ordnance manufacture and the role of the British involvement in this are very disparate and scattered in contemporary and modern secondary sources.

The section on Japanese Ordnance factories by Jane's assessment of the fighting ships of the world's navies states that guns were manufactured at the Kure Naval Yard and by Nihon Seiko-Sho (Japanese Steel Works) at Muroran, Hokkaido, which was licensed to built Armstrongs and Vickers types of guns The company, sometimes also referred to as Muroran Steel Works, was formed in 1907 and owned by Mssrs Vickers Ltd and Sir Armstrong-Whitworth to 25% each and by Hokkaido Colliery & Steam Ship Company, (Jane 1990:161). At a later stage the Japanese equity was raised to 75% with Mitsui investing heavily. A treatise on the Japanese Navy in a British Naval Annual mentions that the Japanese manufactured guns mainly at the Kure Naval Yard, but also at the Osaka Naval Yard. The guns manufactured at Osaka were for coastal defense purposes only. Ammunition for the guns was manufactured by Muroran Steel Works, Kobe Iron & Steel Works, Kawasaki Zosen Kaisha, Mitsubishi Zosen Kaisha, Nippon Heiki Kaisha and others (Jane 1990:161).

An analysis of the gun foundry markings found on the barrels of weapons captured during World War II, showed that the Japanese also manufactured copies of 3-inch Vickers model 1913 and Armstrong-Whitworth model 1900 light coastal defense guns at the Sasebo Naval Yard AIG 1945:24-25), and the Yasu Manufacturing Co. Following the construction of the *Fuji* and the *Yashima* in the United Kingdom, armament manufactured by the Elswick Ordnance Company was used exclusively for a time. In addition, "a factory for the construction of Elswick guns was established in Japan," (Jane 1904:313) which led to a proliferation of Elswick clones in Japan. The pieces manufactured in Japan were:

- the 12-inch 40 calibre;
- the 8-inch 40 calibre;
- the 6-inch 40 calibre ; and
- the smaller 4.7-inch 45 calibre gun.

All were quickfiring guns with a breech loading mechanism. In 1902/03, however, the Japanese navy experimented with the Vickers 6-inch 50 calibre gun, which was then adopted as the standard naval weapon (Jane 1904:313). In 1904 contracts were awarded to W.G.Armstrong, Whitworth & Co. Ltd. (Jane 1904:225). The 1904 programme, consisting of the *Kashima* and the *Katori*, both built at Elswick used Armstrong-Whitworth guns, among them the new 6-inch 47 calibre gun, mounted in a recoil cradle on a central pivot.

The Japanese built their own versions of the British ships, such as the *Satsuma*, launched 15 November 1906 and completed 25 March 1910. This vessel was equipped, among others, with 8 6–inch 45 cal. QF guns, which were most likely copies of British guns.

According to the (official) history of Vickers Company (Scott 1962) the Japanese government invited in 1907 British, American and continental European companies to enter into arrangements with Japanese financiers for the founding of a large ordnance factory. Vickers and Armstrong's accepted the invitation and founded Nihon Seiko Sho (Japanese Steel Works Cº. with a capital of £ 1 million, which was increased in 1909 to £ 1.5 million. In this company Vickers and Armstrong's each held £ 375,000, while Japanese interests represented by the Hokkaido Colliery & Steamship Co.. controlled the remaining 50%.

The Japanese Steel Works had received all Japanese government orders (Scott 1962:85). It seems that from 1911 to 1924 Armstrong's, Whitworth & Co also appointed as the sole agent to Japan for sales of Armstrong's, and hence E.O.C., armament not covered under the joint venture agreement (pers. comm R.Jackson, Chief Archivist Tyne Archives. May 1991). This joint venture of Vickers and Armstrong was only one of many of that company. Prior to that, Vickers and Armstrong's had opened a number of subsidiary companies (jointly and in competition) in Spain, Italy, Japan, Russia and Turkey, manufacturing Vickers and Armstrong's gun models in license (figure 1 & 2; Scott 1962:84-87)

Between 1907 and 1916 the Japanese Navy also ordered a total of seven coastal submarines from Vickers Ltd., and had one such boat also built in license at Kawasaki Iron Works (Jentschura *et al.* 1977:160-161). Between 1918 and 1927 another 18 submarines were built by Mitsubishi Iron Works in Kobe, again under license of Vickers Ltd. (Jentschura *et al.* 1977:162-163).

In January 1917, the Japanese Steel Works was appointed the sole agents in Japan for the sales for both Vickers and Armstrong's armaments and commercial products. The Steel Works had proven successful and had acquired a number of subsidiaries, including Wanishi Iron Works. The capital of the parent company had increased to £4 million following investments from Mitsui. Thus Vickers and Armstrong's held now 25% of the capital compared to 50% they had held in 1907.

What did the involvement of Vickers and Armstrong's entail? Apart from making available the technology and the patents, as well as furnishing some capital to set up the companies, the British also provided technical assistance. according to a contemporary source of the mid-1920s Vickers had British experts working on the shop floor of the Muroran gun factory (Anonymous 1923). In 1911 Vickers

had a display of its Japan-made weapons at the Japan-British Trade Exhibition.

The increasing naval race between Japan, the United States and the United Kingdom, as well as the Japanese activities in China, meant that Japan spent more and more money on its armed forces. In 1921 about 50% of the Japanese budget consisted of military expenditure (Buckley 1970)e. This obviously suited the British arms manufacturers.

Following the Washington Naval Limitations Treaty of 1922 The Japanese refused to renew the arrangement of the sales agreements. Both Vickers and Armstrong's incurred losses in form of cancelled contracts. By 1929 Vickers and Armstrong's, now merged, tried to pull out of the Japanese business which had made little profit at first and by that time incurred losses. The sale of the British interests was also favored by the Japanese government, but the sale was drawn out until 1935 (Scott 1962:146-148).

In the light of the above, then, British designed armament was sold to Japan from 1898 to 1914 in the form of completely outfitted vessels, and from 1904 (1907) in the form of patents and technology for steelworks, partially owned by Japanese interests. Although direct sales of vessels ended with World War I, and although business in British armament sales declined following the signing of the Washington Treaty on Limitation of Naval Tonnage, the formal links between the British Armament Industries (Vickers and Armstrong's, later merged) continued until the mid-1930s.

During this time real transfer of goods, as well as technologies occurred.

THE WASHINGTON TREATY OF 1922 AND THE FATE OF JAPANESE SHIPS

Following the end of World War I, the League of Nations gave Japan the former German possessions north of the equator fro administration. While this only legitimized what the Japanese had achieved in 1914 by military might, the United States objected. In 1922, after the signing of the Yap Treaty and the Washington Naval Limitations Treaty the U.S. consented.

In the years leading up to World War I the European powers of Germany and the United Kingdom, as well as France, were caught up in an unabated race to develop ever larger navies with ever larger warships. To a lesser degree this was also true for the United States and Japan.

The end of World War I and the scrapping of the German Fleet saw the U.S. as one of the largest navies in the world, second only to that of the United Kingdom. After a number of bilateral and trilateral talks, a peace conference was called in Washington to discuss the limitation of the naval powers of Japan, France, Great Britain, the United States and Italy. After long negotiations " *A treaty between the United States of America, the British Empire, France, Italy and Japan, limiting Naval Armament*" was signed on 6 February 1922 at Washington, D.C. (Text reprinted in Ichihashi 1928:365-385) and the following ratio of naval tonnage (in '000 t) was approved:

U.S.	:	UK	:	Japan	:	France	:	Italy
5	:	5	:	3	:	1.67	:	1.67
525t	:	525t	:	315t	:	175t	:	175t

While the tonnage was to be reduced to the level prescribed, the outfitting of the vessels to be scrapped could be landed and saved. In order to reduce the naval tonnage the vessels to be scrapped had to be placed in such a condition that they could not be put to combatant use, either by permanent sinking, breaking up of the vessel or by converting it to target use.

Of the vessels not sunk or broken up, "all guns and essential parts of guns, fire control tops and revolving parts of all barbettes and turrets" had to be removed and landed (see table 3). The naval limitation treaty did not require Japan to destroy its guns. As a result the Japanese navy was obliged to disarm and strike a number of vessels. Stricken were: *Fuji, Shikishima, Asahi, Mikasa, Kashima, Katori* (see table 4).

But even before the official striking off the register, some armament had been taken off during modernization. In 1910 the *Fuji* was reboilered and on that occasion the four 12-inch 40cal guns were replaced by Japanese model 41 12-inch 40cal guns (Jentschura *et al.* 1977:16). The same replacements happened on the *Asahi* in 1917 (*ibid.* 18).

Table 3. Rules for Scrapping Vessels of War

The following rules shall be observed for the scrapping of vessels of war which are to be disposed of in accordance with Articles II and III.

I. A vessel to be scrapped must be placed in such condition that it cannot be put to combatant use.

II. This result must be finally effected in any of the following ways:

a) Permanent sinking of the vessel;

b) Breaking the vessel up. This shall always involve the destruction or removal of all machinery, boilers and armour, and all deck side and bottom plating;

c) Converting the vessel to target use exclusively. In such case all the provisions of paragraph III of this Part, except sub-paragraph (6), in so far as may be necessary to enable the ship to be used as a mobile target, and except sub-paragraph (7), must be previously complied with. Not more than one capital ship may be retained for the purpose at one time by any of the Contracting Powers.

III. (a) Subject to the special exceptions contained in Article IX, when a vessel is due for scrapping, the first stage of scrapping, which consists in rendering a ship incapable of further warlike service, shall be immediately undertaken.

(b) A vessel shall be considered incapable of further warlike service when there shall have been removed and landed, or else destroyed in the ship:

(1) All guns and essential portions of guns, fire-control tops and revolving parts of barbettes and turrets;

(2) All machinery for working hydraulic or electric mountings;

(3) All fire-control instruments and range-finders;

(4) All ammunition, explosives and mines;

(5) All torpedoes, warheads and torpedo tubes;

(6) All wireless telegraphy installations;

(7) The conning tower and all side armour, or alternatively all main propelling machinery; and

(8) All landing and flying-of platforms and all other aviation accessories.

(from: A treaty between the United States of America, the British Empire, France, Italy and Japan, limiting Naval Armament. Chapter II, Part 2, Article III, section b, subsection 1.Signed 6 Feb. 1922 Washington,. D.C.).

In addition, Japan took the opportunity given by the Washington Treaty, to upgrade the weapons carried on those vessels which were retained. In 1924 most British and other 6 -inch guns were replaced by Japanese manufacture type 41 6-inch 40cal or 6-inch 45cal guns (see the rearmament data in Jentschura *et al.* 1977). The excess number of navy turret mounted guns were released to the Imperial Army after the Washington conference, thus inheriting "modern" 8-inch, 10-inch, 12-inch and 15-inch guns (USAFPAC 1946:63).

A number of Russian vessels were captured or raised after the Battle of Tsushima and fitted with Japanese 6-inch 45 calibre Armstrong clones between 1906 and 1908. Some of them, such as the *Tango* (ex-*Poltava*) or the *Sagami* (ex-*Presviet*) were returned to Russia in 1916 (Jentschura *et al.* 1977:19). Although not yet traced, the rearmament of some vessels, such as the *Iwami* (ex-*Orel*) meant that the Russian 6-inch guns were taken off (12 6-inch 45cal in this case) and replaced by Japanese weapons of the same or larger calibre. These Russian gun barrels presumably also went into storage.

A great number of other 6-inch guns of the 30cal, 40cal and especially 45cal designs were used by the Imperial Japanese Navy as coastal defense guns in Japan proper. It would appear that the IJA used only Krupp guns for that purpose.

While the compilation of guns in table 3 shows the 6-inch guns which had been taken from floating units, the table does not encompass the guns manufactured for coastal defense purposes only. Comparing the minimum number of 6-inch guns salved from the naval units listed in Table 3 with the reported number of guns emplaced in Japan, the Aleutians and Micronesia, it becomes clear that not all guns have been used, even if we assume a 50% "mortality" rate. At the time of writing the fate of the remaining guns could not be cleared up.

THE "SINGAPORE GUNS"

The heavy guns found in the Marshall Islands and elsewhere in the Pacific are often addressed as the "Singapore guns" and it is claimed that these guns were taken and relocated by the Japanese after the fall of Singapore in early 1942. The Pacific area seems to be re-

plete with "Singapore guns." A Singapore origin has been claimed for the :

- 8-inch guns on Betio, Tarawa, Kiribati (Hinz 1990a:42);
- 7-inch [sic!] guns on Wake I. (Cohen 1983:107), where also 8" guns from Hong Kong are said to have been installed (*ibid.:* 95);.
- 120 and 140mm guns on Kiska (Dowell 1976:90, 96; 327), and the
- 127mm DP guns on Kwajalein (Craib 1989).

As this assertion is not uncommon, let us look into this matter in greater detail. Some of the guns are claimed to be "Singapore guns" are very obviously Japanese guns, such as the 127mm type 89 (1929) dual purpose guns of Kwajalein. Some guns, however, may well come from British bases, such as Singapore or Hong Kong. Before we discuss the origin, let us look at these bases in question and the history behind them.

By the end of 1941 and the beginning of 1942 the Japanese forces overran a number of U.S. and British military bases and possessions

- Guam (10 December 1941)
- Wake (23 December 1941)
- Singapore
- Hong Kong (25 December 1941)
- Corregidor
- Makin, Gilberts
- Tarawa, Gilberts

On all these bases the Japanese captured weapons, such as 3– and 5-inch coastal defense guns on Wake, and an assortment of weapons on Singapore, Hong Kong and the U.S. installations in the Philippines. It can be imagined that the Allied Forces were worried about the fate of these weapons and the prospect of future redeployment into other (sub)theatres of war. On the other hand, it can also be appreciated that the Japanese themselves were in the need to maintain the defense of the newly captured bases in the case of an Allied counter attack.

The Allied Forces conducted a number of intelligence missions, where and when possible, to ascertain the possible removal of such weapons. A number of reports has been produced discussing the presence of such weapons in the bases in question (cf. MID 1945).

However, *the* Singapore guns alluded to, are 16-inch (406mm) guns (Campbell 1985:24), while the heaviest guns seen in the Marshall Islands are 6-inch coastal defense guns. Therefore the use of *the* Singapore guns in the Marshall Islands can be ruled out. However, there is still potential that some of the guns were taken from Singapore and relocated to the Pacific bases then still under construction.

Due to the changed political situation in the far east and the Pacific following the redistribution of the former German possessions after World War I, the British Government decided to develop Singapore into the principal South east Asian and Pacific Naval Base. The development plan was modified many times over due to budget and policy changes, as well as due to the Washington Naval Limitations Treaty. It finally ahead in 1924 and was completed in 1930, but was constantly modified until 1939. The existing naval defense had been created in 1909-1911 and comprised of five 9.2-inch and four 6-inch guns (Neidpath 1981:83).

The 1924 development plan saw the deployment of 12-inch and 15-inch naval guns as the main long range armament and 7.5-inch or 9.2-inch as well as 4.7-inch and 6-inch guns as the medium-range and inshore defenses (McIntyre 1979:71)

The 1935 modified plan saw eight pairs of 6-inch guns emplaced (McIntyre 1979:71). In 1937 another pair had been added (Neidpath 1981:244). As far as the large guns were concerned, the British Navy had plenty of surplus of guns of 1914-1918 vintage at its disposal (McIntyre 1979:72). We have, at present, no data on the vintage of all of the replacement guns of the 6-inch calibre. In view of the surplus of World War I guns we can assume that the 1909-1911 guns had been replaced by newer models. This appears reasonable as the base was developed almost from scratch. A volume commemorating the centenary of the Singapore Artillery asserts that the 6-inch guns installed at Singapore as part of the mid-1930s modifications were models Mark XXIV, made in 1938 (Singapore Artillery 1988:35; 53).

In view of these data, then, it is unlikely that the guns emplaced in the Japanese bases in the Marshall Islands or the Federated States of Micronesia come from Singapore. In addition, Denfeld quoting a Japanese source, asserts that none of the guns captured at Singapore were shipped to the Central Pacific (Denfeld 1981b:8 quoting: Namaguchi & Akijama 1942).

The main source of confusion seems to be the fact that the Japanese used guns of British manufacture, such as the 8-inch Vickers-Armstrong naval guns, as well as Japanese copies of British guns. As outlined above, the land-based coastal defense guns used by both the Japanese and the allied forces are commonly naval guns taken from decommissioned warships.

British guns of other calibres were found at Kiska, namely the 4.7inch Q.F. made by Armstrong Whitworth & Co (Model 1905) and another 6-inch (?) gun made in 1900 with the breechblock number 12699 (Verbeck 1943:19-21)., as well as a 76mm coastal defense gun made by the British Yasu Manufacturing Co. (Model 1898; Dowell 1976:327-328; Verbeck 1943:19-21); at Saipan, namely 120 and 140mm Vickers models (Denfeld 1981a:41); at Agingan Point, Saipan where 6-inch guns were encountered (CinCPac-CinCPOA 1945c), at Enewetak, where one 4.7 inch-gun stamped 1898 was found (MID 1945:25) and at Kwajalein, where an British-built 4.7 inch artillery piece was captured (CinCPac-CinCPOA 1945j:15, the gun is erronously specified as a 47mm gun). British-built three-inch guns were encountered at Tarawa (Kiribati; AIG 1945: 24), Kolombangara (Solomons; AIG 1945: 25), and Tinian (Marianas, AIG 1945: 25) (all Vickers 1913 models) and Saipan (Marianas) (a Armstrong-Whitworth 1900 model; AIG 1945: 25). Japanese copies of these guns, made at the Sasebo Naval Arsenal, were found at Kolombangara (AIG 1945: 25) and Kiska (AIG 1945: 25).

A CASE STUDY: TRACING THE SIX-INCH GUNS IN THE MARSHALL ISLANDS

The two types of heavy coastal defense guns encountered in the Marshall Islands are 140mm and 150mm guns. The breechblock numbers of most guns could be read and traced to give evidence on the origin of the guns. So far, the attempts to track the gun numbers to individual vessels has not been successful. The archival sources approached could not provide the necessary data, either because the mass of archival materials was so overwhelming (i.e. Public Records Office, London Such as in the Public Records Office, London) or because the data are not on hand (such as in the Imperial War Museum London; Tyne Archives for Armstrong Whitworth/Vickers Company Archives).

However, based on the dates of the ships' launching and completion (tables and 2), as well as the gun numbers and dates punched into the breech block, some conjectures can be made. The dated guns in the Marshall Islands fall into three age groups: 1898 (Taroa), 1901 (Wotje) and 1905 (Mile). The following is based on the assumption that the gun barrels would be cast after the ship was laid down, but before or around the time it was launched, as the guns needed to be completed and test fired. Based on these assumptions, then, the 1898 gun barrels can belong to the following vessels: cruisers *Asama*, *Tokiwa*, the battleship *Shikishima*, and possibly the cruiser *Izumo*. The 1901 gun barrels could conceivably come from the battleship *Mikasa*, launched on 8 November 1900 and completed on 1 March 1902. No other ship would fit that bill. The British built 1905 gun barrels most likely come from either of the two "Elswick battleships", the *Kashima* and the *Katori* (Table 5).

THE FUTURE

Given that there are in tangible remains of this period of British-Japanese naval relations, the guns in Micronesia have attained a high level of historical and heritage significance. A conservation management plan for some of the resources has already been initiated (Look & Spennemann 1993a), as well as a series of metal conservation training courses (Look & Spennemann 1993b; 1994) to safeguard these resources in place and unchanged for the future.

Figure 4. Damaged 6-inch gun on Wotje I, Wotje Atoll

Figure 5. Breechblock of a Elswick Ordnance Company 6-inch gun on Taroa I., Maloelap Atoll

Figure 6. Breechblock of a Elswick Ordnance Company 6-inch gun on Taroa I., Maloelap Atoll

Figure 7. A turreted Japanese copy of a Vickers-Armstrong pattern six-inch gun in north-western Balbeldoab I., Palau

Table 4 Six-inch guns Possibly held in Japanese hand after the disarmament following the Washington Naval Limitation Treaty (and later re-armaments in some instances)

Ship	Production Dates	British 6/40	British 6/45	Japanese 6/40	Japanese 6/45	Japanese 6/50	Japanese 6/40	German 6/35	Russian 6/45	Italian 6/45	USA 6/45	Total Guns
Heien [1]	1883-1890						2					
Chin'en	1880-1885						2					
	1895-1911			4								
Iki	1886-1893							8				
	1905-1915			6								
Mishima [14]	1907-1928			6								
Okinoshima [2]	1905-1915			6								
Fuji	1894-1897	10										10
Yashima	1894-1897	10										—
Shikishima	1897-1900		14									14
Hatsuse	1897-1900		14									—
Asahi	1897-1900		14									14
Mikasa [3]	1899-1902		14									—
	1906-1908				14							14
Kashima	1904-1906		12									12
Katori	1904-1906		12									12
Suo [4]]	1905-1908				10							10
Hizen [5]	1906-1908				12							12
Iwami [6]	1906-07								12			12
Tango [7]	1892-1905								12			
Kawachi	1909-1912					10						—
Settsu	1909-1912					10						10
Hiei	1911-1914					16						16
Kongo	1911-1913					16						16
Kishima	1912-1915					16						16
Haruna	1912-1915					16						16
Fuso	1912-1915					16						16
Yamashiro	1913-1917					14						14
Asama	1895-1898	14										14
Tokiwa [8]	1895-1898	14										14
	1910					8						8
Azuma [8]	1898-1900	12										12
	1924					12						12
Yakumo[8]	1898-1900	14										14
	1924					12						12
Izumo[8]	1898-1900	14										14
	1924				14							14
Iwate[8]	1899-1901	14										14
	1924				14							14
Kasuga [9]	1902-1904									14		14
	1924				14							14
Nishhin [10]	1902-1904									14		14
	1924				14							14
Aso [11]	1899-1903								8			—
	1905-1908				8							8
	1913					2						2
Tsukuba	1905-1907				12							—
Ikoma	1905-1907				12							12
Niitaka	1902-1904				6							—

Tsushima	1902-1904				6							6
Otowa	1903-1904					2						—
Tsugaru [12]	1896-1902								8			—
	1910				8							8
Soya [13]	1898-1900										12	12
	1906-1907				12							12
Tone	1905-1910					2						2
Chikuma	1910-1912					8						8
Hirado	1910-1912					8						8
Yahagi	1910-1912					8						8
Total		102	80	22	156	176	4	8	40	28	12	628

[1] Captured from Chinese in 1895, rearmed with British weapons in 1902 (?); sunk by Russian mine off Port Arthur, 18 September 1904.; [2] ex-*General Admiral Apraxin*; captured from the Russians after the battle of Tsushima.; [3] The *Mikasa* sank at anchor on 11/12 November 1905 and was raised on 7-8-1906. It reentered, repaired and rearmed, service on 24 August 1908. After an immersion of that long a time, the original guns were unusable. It is assumed that they were replaced by Japanese copies;; [4] ex-*Pobieda* captured from the Russians after the battle of Tsushima; [5] ex-*Retzivan* captured from the Russians after the battle of Tsushima; [6] ex-*Orel* captured from the Russians after the battle of Tsushima; [7] ex-*Poltava* captured from the Russians after the battle of Tsushima; [8] partially rearmed with Japanese type 41 6/45;; [9] ex-*Mitra* captured from the Russians after the battle of Tsushima; [10] ex-*Roca* captured from the Russians after the battle of Tsushima; [11] ex-*Bayan* refitted with Armstrong-type weapons;; [12] ex-*Pallada* captured from the Russians after the battle of Tsushima; [13] ex-*Varyag* captured from the Russians after the battle of Tsushima; [14] ex-*Admiral Senyavin*; captured from the Russians after the battle of Tsushima.

Table 5. Known breechblock numbers and dates of British six-inch guns emplaced in Japanese Pacific bases.

N°	Year	Maker	Island	Location	Probable origin
1168 A	1905	EOC	Mile, Marshalls	S	*Katori*
1236			Mile, Marshalls	SW	
11377	1898	EOC	Taroa, Marshalls	NE	*Asama, Tokiwa,* or *Shikishima*
11378	1898	EOC	Taroa, Marshalls	NE	*Asama, Tokiwa,* or *Shikishima*
12699	1900	EOC	Kiska, Aleutians		*Izumo or Iwate*
12857	1901	EOC	Wotje, Marshalls	SE	*Mikasa*
13828	1901	EOC	Wotje, Marshalls	SE	*Mikasa*
15658	1905	EOC	Mile, Marshalls	NW	*Katori*
15668	1905	EOC	Mile, Marshalls	NW	*Katori*
15859 (?)	1905 (?)	EOC	Mile, Marshalls	NW	*Katori*

ENDNOTE

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