

THE DEVELOPMENT OF THE JAPANESE SHIPPING INDUSTRIES IN THE POST-WAR ERA

BY

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Introduction

The history of modern Japan began in 1853 with the arrival of Commodore Perry of the U.S. Navy in what is now Tokyo Bay. His visit marked the end of two and a half centuries of isolation during which Japan had been almost entirely cut off from the technical advances that were being made in the West. This "Era of Seclusion" had particularly severe consequences on shipping for all overseas trade and voyages were banned and only the coasting sector of the industry survived. This, however, did continue in a vigorous manner and Japanese "wasen" — traditional small, wooden, sailing ships — carried cargoes of rice, saké and fruit from outlying provinces to the major centres of population at Edo (Tokyo) and Kyoto.

The political consequences of Commodore Perry's arrival were dramatic. The existing Tokugawa regime, which was already weak, found itself in an impossible position. On the one hand powerful elements in Japan insisted that the traditional policy of excluding foreigners be continued while, on the other, it was aware that this was not a practical course of action. A considerable controversy then arose and the position of the Tokugawa government gradually deteriorated as it was obliged to make concessions to the United States and then to all the major European powers. These difficulties came to a head in 1868 and the Shogun resigned by transferring his authority back to the Imperial throne. As the Emperor Meiji was then a boy of only thirteen this meant that power was assumed by a group of his advisers and it was under their guidance that Japan accepted the need to adopt Western technology and practices.

Following what has become known as the Meiji Restoration the new government was faced with the immense task of modernising virtually every aspect of the country's economic, social and political life. From the very beginning, however, shipping was given a high priority. This was because it was firmly believed that it was the West's control of communications that had enabled it to exploit the trade and resources of China and of the East. In the first instance, therefore, Japan was determined to retain its coastal trades in its own hands and then made every effort to support attempts by its own nationals to break into the short-sea and, eventually,

the ocean routes which would link it with the outside world. Such was the success of this policy that the Japanese ship-operating industry grew rapidly and by 1910 it comprised over $1\frac{1}{4}$ million net tons and was employing the world's third largest ocean going fleet after the U.K. (over 12 million tons) and Germany (near 3 million tons) (see Table 1).

Japan's shipbuilding capacity had grown more slowly because of its lack of efficient steel and engineering industries but by 1914 it was capable of constructing virtually every type of vessel. However, as its costs — even with the advantage of low labour charges — were still above the international level, it could not export and approximately 50% of its domestic requirements were purchased from abroad. Nevertheless, its annual production had by then reached 86,000 gross tons which placed it in sixth place after the U.K. (1,680,000 g.t.), Germany (387,000 g.t.), the U.S.A. (201,000 g.t.), Holland (188,000 g.t.) and France (114,000 g.t.) (see Table 2).

The First World War saw a great expansion in both ship-operating and ship-building but both sectors lost much ground in the early post-war era. Ship operators were the more successful. By adopting advanced design motor ships they gained a foothold in a number of the more profitable routes (especially to New York). They also competed at the bottom of the market with Greek owners by utilising sub-standard vessels and poorly paid crews. This enabled the merchant fleet to grow, but its average age gradually increased and, apart from a smallish number of modern ships, it was characterised by poor quality and a low level of efficiency. It was only the moderate wage costs, then, which allowed it to remain cost-effective.

In 1919 ship-building returned to the production of 1914 and only slowly recovered. It still had a significant cost disadvantage compared with the West — especially Britain — and there is no record of any commercial ship exports during the whole of the inter-war period. After c. 1931 — and particularly after 1937 — both industries were moved on to a war-time footing and their activities were directed by strategic as well as economic considerations.

The Second World War

At the beginning of the war with Britain and the U.S.A. in December, 1941, Japan possessed a merchant fleet of just under 6 million gross tons plus a large number of wooden coastal and fishing vessels totalling 1.1 m. tons. During the war 3.3 m. tons were constructed (less than might have been expected because of the demand for naval ships) and many were captured but losses were so severe that only 1.5 m. tons remained at the end of hostilities. Of these only 557,000 tons were operable (see Table 3).

Construction of wooden ships was also undertaken but, again, failed to keep pace with sinkings. As a result only 244,000 tons survived in August, 1945, and only 105,000 tons remained serviceable. Losses were sustained as follows :

Table I. — Net tonnage of the leading mercantile fleets of the world from 150 to 1910, showing :

- (1) Sailing ship and steamship tonnage.
- (2) World's totals.
- (3) The British, United Kingdom, United States of American, and German percentage of the world's total.
- (4) These percentages also shown in terms of steamship tonnage, reckoning 1 ton of steam = 4 tons sailing.

(The tonnage figures in this table are taken from *Progress of Merchant Shipping in the United Kingdom and Principal Maritime Countries*, C.J. 6180, 1912.)

Countries		1850	1860	1870	1880	1890	1900	1905	1907	1910
United Kingdom	Sailing	3,396,659	4,204,360	4,577,855	3,851,045	2,936,021	2,096,498	1,670,766	1,461,376	1,113,944
	Steam	168,474	454,327	1,112,934	2,723,468	5,042,517	7,207,610	9,064,816	10,023,723	10,422,719
British Possessions	Sailing	648,672	1,096,464	1,369,145	1,646,844	1,338,361	915,096	906,372	883,448	879,926
	Steam	19,157	45,817	89,200	225,814	371,189	532,188	696,430	814,808	926,399
British Empire	Sailing	4,045,331	5,300,824	5,947,000	5,497,889	4,274,382	3,011,594	2,577,138	2,344,824	1,993,870
	Steam	187,631	500,144	1,202,134	2,949,282	5,413,706	7,739,798	9,761,266	10,838,531	11,369,118
Russia (including Finland)	Sailing	—	—	—	655,771	560,267	556,614	511,518	564,721	581,316
	Steam	—	—	—	100,421	234,418	417,922	440,643	501,638	535,040
Norway	Sailing	298,315	558,927	1,009,200	1,460,596	1,502,584	1,002,675	813,864	750,862	628,287
	Steam	—	—	13,715	58,062	203,115	505,443	668,230	819,282	897,440
Sweden	Sailing	—	—	—	421,693	369,680	288,687	263,425	238,742	175,916
	Steam	—	—	—	81,049	141,267	325,105	459,664	532,515	596,763
Denmark	Sailing	—	—	168,193	197,509	189,406	158,303	149,310	141,035	131,342
	Steam	—	—	10,453	51,957	112,788	250,137	334,124	404,946	415,496
German Empire	Sailing	—	—	900,361	965,767	709,761	593,770	553,817	544,652	506,837
	Steam	—	—	81,994	215,758	723,652	1,347,875	1,915,475	2,256,783	2,396,733
Netherlands	Sailing	289,870	423,790	370,159	263,887	127,200	78,493	54,417	49,640	45,936
	Steam	2,706	10,132	19,455	64,394	128,511	268,430	356,890	398,026	488,339
Belgium	Sailing	33,315	28,857	20,648	10,442	4,393	741	2,844	964	3,402
	Steam	1,604	4,254	9,501	65,224	71,553	112,518	96,889	119,223	187,730
France	Sailing	674,228	928,099	917,633	651,539	444,092	501,175	676,193	662,828	636,061
	Steam	13,925	68,025	154,415	277,759	499,921	527,551	711,027	739,819	815,567
Portugal	Sailing	—	—	—	—	—	57,925	43,126	38,363	43,844
	Steam	—	—	—	—	—	51,506	58,077	62,675	70,193
Spain	Sailing	—	—	—	326,438	210,247	95,187	58,201	45,185	44,940
	Steam	—	—	—	233,695	407,935	679,392	685,680	676,926	744,517
Italy	Sailing	—	—	980,064	922,126	634,149	571,164	541,171	468,674	432,695
	Steam	—	—	32,100	77,050	106,567	376,844	484,432	526,586	674,497
Austria-Hungary	Sailing	—	—	279,400	258,642	138,796	52,736	39,565	37,658	32,235
	Steam	—	—	49,977	63,970	97,852	246,989	366,070	418,838	477,616
Greece	Sailing	—	263,075	398,703	—	226,702	175,867	145,312	145,283	145,284
	Steam	—	—	5,360	—	44,684	143,436	225,512	257,900	301,785
United States of America										
	a) Registered for foreign trade									
	Sailing	1,540,769	2,448,941	1,324,256	1,206,206	749,065	485,352	353,333	269,021	234,848
	Steam	44,942	97,296	192,544	146,604	197,630	341,342	601,180	602,125	556,977
b) Enrolled for river and lakes	Sailing	1,418,550	1,982,297	1,795,389	1,650,270	1,816,344	2,021,690	2,361,716	2,450,405	2,372,873
	Steam	481,005	770,641	882,551	1,064,954	1,661,458	2,316,455	3,140,314	3,677,243	4,343,384
China	Sailing	—	—	—	21,694	11,801	20,541	19,560	18,243	14,314
	Steam	—	—	—	—	29,766	18,215	45,617	57,604	88,888
Japan	Sailing	—	—	—	41,215	48,094	320,571	334,684	366,013	412,859
	Steam	—	—	—	—	93,812	543,365	938,783	1,116,193	1,233,785
Total		9,032,191	13,295,302	16,765,205	19,991,863	22,265,598	26,205,398	30,849,067	33,132,066	34,629,742
World's total	Sailing	8,300,378	11,844,810	14,111,006	14,541,684	12,016,963	9,993,075	9,559,194	9,126,113	8,435,874
	Steam	731,813	1,450,492	2,654,199	5,450,179	10,248,635	16,212,323	21,289,873	24,005,953	26,193,868
British percentage of world's total		46.86	43.33	42.64	42.25	43.51	41.02	39.99	39.79	38.58
United Kingdom do		39.47	34.80	33.94	32.88	35.83	35.50	34.80	34.66	33.37
United States of America do		38.58	39.51	25.02	20.38	19.87	19.70	20.92	21.12	21.68
German Empire do		—	—	5.85	5.91	6.43	7.40	8.00	8.42	8.38
British percentage of world's total in terms of steamship tonnage, reckoning 1 ton steam = 4 tons sailing		42.7	40.86	43.49	47.56	48.91	45.39	43.98	43.46	41.93
United Kingdom do		36.25	33.95	36.51	40.57	43.58	41.32	40.00	39.48	37.88
United States of America including a) and b) do		49.09	44.55	30.00	21.19	19.46	17.55	24.24	18.86	19.61
German Empire do		—	—	5.85	5.03	6.79	7.99	8.67	9.09	8.91

Source : A. W. KIRKALDY, *British Shipping* reprinted by Augustus M. Kelley, New York, 1970, Appendix XVII.

Submarines	: 55%	Mines	: 4.25%
Carrier Aircraft	: 16%	Surface ships	: 1.00%
Land based Aircraft	: 14.5%	Misc.	: 4.25%

Table 2. — Mercantile shipbuilding output of the chief shipbuilding countries, 1892-1914
(in thousands of gross tons).

Year	U.K.	France	Germany	Holland	Italy	Japan	Norway	U.S.A.	World
1892	1,110	17	65	14	14	—	25	63	1,358
1893	836	20	60	1	11	1	17	27	1,027
1894	1,047	20	120	15	5	3	17	67	1,324
1895	951	28	88	8	6	2	13	85	1,218
1896	1,160	45	103	12	7	8	12	184	1,568
1897	925	49	140	20	13	7	17	87	1,332
1898	1,368	67	153	19	27	11	23	173	1,893
1899	1,417	90	212	34	49	7	28	224	2,122
1900	1,442	117	205	45	68	5	33	334	2,304
1901	1,525	178	218	30	61	37	37	433	2,618
1902	1,428	192	214	69	46	27	38	379	2,503
1903	1,191	93	184	59	50	35	42	382	2,146
1904	1,205	81	202	56	30	33	50	239	1,988
1905	1,623	73	255	44	62	32	53	303	2,515
1906	1,828	35	318	67	31	42	61	441	2,920
1907	1,608	62	275	69	45	66	58	475	2,788
1908	930	83	208	59	27	60	53	305	1,833
1909	991	42	129	59	31	52	29	210	1,602
1910	1,143	81	159	71	23	30	37	331	1,958
1911	1,904	125	256	93	17	44	35	172	2,650
1912	1,739	111	375	99	25	58	50	284	2,902
1913	1,932	176	465	104	50	65	51	276	3,333
1914	1,684	114	387	118	43	86	54	201	2853 ^a

^a Data for several countries unobtainable.

Source : S. POLLARD & P. ROBERTSON, *The British Shipbuilding Industry 1870-1914*, Harvard U.P. - Cambridge, Mass. - London, 1979, Table B.7, p. 249. (Based on Lloyd's Register, *Annual Returns*.)

The Post-War Era

Although 85% of Japan's ship-building capacity remained undamaged when the war came to an end little effective work could be undertaken because of shortages of materials and power. Skilled manpower was also in short supply but this situation was quickly improved.

MacArthur's initial plans included no great role for either of the shipping industries but the need for vessels for coastal and inter-island work saw some encouragement given to the repair and maintenance of existing ships. This still left a considerable shortfall so bomb damaged craft — some of them sunk within the ports and harbours — were gradually resurrected.

Table 3. — Japanese merchant shipping during World War II.

Period	Tonnage captured or salvaged	Tonnage built	Total gain	Tonnage lost ^a	+ or -	Tonnage available
8/12/41	—	—	—	—	—	5,996,657
8/12/41 to 31/12/42	672,411	272,963	945,374	1,123,156 (241 ships)	-177,782	5,818,875
1/1/43 to 31/12/43	109,028	769,085	878,113	1,820,919 (434 ships)	-942,806	4,876,069
1/1/44 to 31/12/44	35,644	1,699,203	1,734,847	3,891,019 (969 ships)	-2,156,172	2,719,897
1/1/45 to 15/8/45	5,880	559,563	565,443	1,782,140	-1,216,697	1,503,200 ^c
Total	822,963	3,300,814	4,123,777	8,617,234 (2,345 ships) ^b	-4,493,457	

Notes: The table excludes all ships of less than 500 tons gross weight.

^a Of this the tanker tonnage lost was:

8/12/41 to 31/12/42	9,538	(2 ships)
1/1/43 to 31/12/43	169,491	(23 ships)
1/1/44 to 31/12/44	754,889	(131 ships)
1/1/45 to 15/8/45	351,028	(103 ships)
Total	1,284,946	(259 ships or 15% of total losses).

^b In addition 1,966,521 tons of naval shipping (687 ships) were sunk, making the total tonnage lost 10,583,755.

^c Of this tonnage only some 557,000 was operable.

Source: S. WOODBURN KIRBY, *The War Against Japan*, H.M.S.O., London, 1969, Vol. V, p. 475.

Table 4. — Japanese tonnage completed (above 100 g.t.) (in thousands of gross tons).

Year	No.	Tonnage	Year	No.	Tonnage
1947	—	n.a.	1958	452	2,234
1948	—	n.a.	1959	503	1,728
1949	70	118	1960	653	1,839
1950	76	232	1961	627	1,719
1951	87	431	1962	564	2,073
1952	97	513	1963	699	2,269
1953	122	732	1964	699	3,764
1954	180	433	1965	699	4,886
1955	158	561	1966	733	6,495
1956	297	1,538	1967	905	7,217
1957	420	2,309	1968	1,118	8,349

Source: Lloyd's Register.

All aspects of shipping were at first placed under the control of S.C.A.J.A.P. (the U.S. Naval Shipping Control Authority) but in November, 1945, the C.M.M.C. (Civil Merchant Marine Committee) was established as a sub-committee to take responsibility for ship management and operation. The latter was organised by the Japanese government as the Senpaku Uneikai. This had operated since 1942 for the Imperial government but now it took its instructions from SCAJAP.

The U.S. policy towards Japan gradually softened after 1947. This was partly as a result of the "Cold War" but it was also a gradual appreciation of the fact that Japan must be allowed to earn its own living or America would be obliged to continue its financial support indefinitely. Thus the Programmed Shipbuilding Scheme was approved in mid-1947 and this was to remain until the present day.

Construction until 1948 was primarily of small coastal vessels but, thereafter, a wider range of ships were built. The statistics produced by Lloyds Register (Table 4) and from official Japanese source (Table 5) are not directly comparable but both show the enormous growth which then followed. By 1956 Japan had overtaken the U.K. as the world's largest producer of merchant shipping and has since dominated the global market (Table 6).

This advance in ship-building has been complemented by an enormous increase in Japan's merchant fleet (Table 7). The progress of both sides of the industry was disturbed by a downturn in demand in the early sixties. Thus on the operating side it then became necessary to re-organise the whole structure of the business. This was accomplished with a minimum of delay and cost by 1964 — a typical example of Japan's ability to react quickly to changing circumstances (Table 8).

On the building side the pressure led to a need to concentrate into larger units and by 1971 the 17 original firms which had emerged during the post-war era had been amalgamated into only 7 new groups (Table 9).

The consequence of these changes was that Japan was in good shape to cope with the impact of the oil shock of the early seventies. Thus in spite of all difficulties the mercantile marine grew to be the largest of the true flag operators (Table 10).

Further reduction in demand led, however, to a need to reduce building capacity and with state encouragement 33% of the total was eliminated in less than two years during 1978-79. This was a permanent reduction in productive capacity. The redundant yards were not moth-balled but were demolished and the sites utilised for other purposes — housing, industry and leisure facilities.

At this stage many key workers were transferred to other industries. This process was considerably eased by the links which all the principal shipyards had as members of the peculiarly Japanese institution, the *Zaibatsu*. The slimming-down of ship-building was also facilitated by the fact that many of the other workers were not directly employed but were supplied by sub-contractors. As these agencies acted as intermediaries between the majority of the workers and the company it meant that they supplied whatever labour was required. As this was supplied on a daily basis the shipyard could arrange for its exact requirements to be met and during the period of contraction it was only necessary to scale down its demands.

Table 5 (a). — Japanese tonnage completed, 1870-1918 (in thousands of gross tons).

Year	New building ship				Imported ship			
	Steamship		Sailing ship		Steamship		Sailing ship	
	No.	Tonnage	No.	Tonnage	No.	Tonnage	No.	Tonnage
1870	2	57	—	—	18	7,254	7	1,552
1871	5	115	1	50	33	7,241	20	5,685
1872	6	78	—	—	20	2,684	7	1,423
1873	2	32	2	91	12	3,123	4	677
1874	3	64	—	—	12	1,978	8	2,042
1875	14	462	4	83	27	18,397	4	439
1876	8	146	11	639	7	732	6	2,378
1877	16	474	16	1,649	15	10,596	11	4,001
1878	25	912	51	5,204	7	1,866	14	10,687
1879	19	839	50	5,781	3	158	9	3,311
1880	40	3,186	146	10,889	7	1,222	15	3,646
1881	38	2,097	107	9,477	1	498	6	1,527
1882	27	1,884	73	8,175	1	298	9	2,660
1883	31	3,411	32	2,790	4	2,913	2	597
1884	11	1,338	19	2,889	4	2,595	1	219
1885	19	1,529	16	1,921	7	6,991	2	389
1886	16	1,128	23	1,485	4	3,836	2	523
1887	18	1,440	23	1,633	13	8,514	2	648
1888	26	2,696	18	1,348	11	8,582	—	—
1889	26	2,269	18	1,300	8	5,451	—	—
1890	30	4,291	13	1,141	10	8,324	—	—
1891	33	3,215	6	758	4	4,125	1	413
1892	32	3,546	8	644	7	4,930	—	—
1893	26	2,349	4	431	10	8,064	2	1,671
1894	33	3,495	10	1,229	38	60,180	—	—
1895	47	5,553	6	890	35	43,117	2	537
1896	36	3,597	11	997	27	22,059	—	—
1897	57	6,611	18	2,324	22	41,818	—	—
1898	54	13,929	203	20,950	10	44,110	—	—
1899	55	19,145	216	20,342	7	24,486	1	83
1900	53	15,308	193	17,873	13	28,492	2	235
1901	71	31,829	202	20,259	12	19,344	1	113
1902	67	16,328	137	13,035	10	20,684	—	—
1903	65	33,612	124	9,925	17	33,440	1	161
1904	114	27,500	119	11,275	72	177,298	1	45
1905	103	30,089	278	16,760	100	138,706	11	517
1906	90	35,151	411	26,444	22	30,142	—	—
1907	79	29,898	248	19,949	34	32,009	3	362
1908	77	68,070	192	14,607	21	19,178	2	167
1909	68	50,795	198	15,188	8	8,032	—	—
1910	71	35,644	144	11,205	20	40,268	1	70
1911	137	43,817	203	12,431	49	129,454	—	—
1912	170	43,013	351	22,500	24	49,019	—	—
1913	112	54,950	654	34,965	27	55,120	—	—
1914	85	58,846	571	34,916	13	32,182	1	84
1915	73	78,918	428	26,941	11	25,081	1	430
1916	93	138,011	498	42,342	11	32,065	—	—
1917	196	226,843	1,173	108,479	13	7,280	1	589
1918	516	598,691	2,043	186,580	20	3,632	1	108

Thus the reduction in capacity was accomplished without the heavy level of cost which would have been necessary in other countries where the structure of the industry was different. In addition, in spite of the contraction, Japan was able to remain the largest producer of merchant shipping, although over the past decade she has experienced ever-increasing competition from South Korea (see Table 11).

Japan's position as the world's biggest operator of merchant vessels under its own flag has also been maintained but in recent years has been subjected to massive rivalry from the Flag of Convenience operators.

Table 5 (b). — Japanese tonnage completed, 1919-1945 (in thousands of gross tons).

Year	New building ship				Imported ship			
	Steamship		Sailing ship		Steamship		Sailing ship	
	No.	Tonnage	No.	Tonnage	No.	Tonnage	No.	Tonnage
1919	323	636,271	1,564	105,895	15	947	1	69
1920	229	486,984	726	51,353	6	544	—	—
1921	132	216,840	277	15,198	4	2,883	—	—
1922	126	102,035	189	11,005	22	57,911	1	30
1923	132	101,008	261	11,619	6	12,550	—	—
1924	125	85,481	679	32,763	56	184,517	—	—
1925	125	48,185	558	25,628	10	23,644	1	184
1926	86	62,375	499	22,426	31	112,717	—	—
1927	93	59,952	430	19,996	29	70,049	—	—
1928	99	75,344	511	23,434	31	94,265	—	—
1929	119	98,600	751	38,266	11	22,165	—	—
1930	122	206,146	541	33,272	3	8,320—	—	—
1931	103	92,908	396	20,734	5	2,166	1	49
1932	128	53,387	267	21,368	—	—	—	—
1933	104	60,693	487	28,954	—	—	—	—
1934	172	147,118	808	55,026	1	23	—	—
1935	166	150,123	906	63,292	11	18,284	—	—
1936	192	217,461	922	50,196	3	1,279	5	196
1937	219	399,324	1,141	67,979	5	29,636	—	—
1938	233	423,039	777	62,144	62	273,195	—	—
1939	116	333,431	—	—	—	—	—	—
1940	125	307,161	—	—	—	—	—	—
1941	112	241,090	—	—	—	—	—	—
1942	118	293,059	—	—	—	—	—	—
1943	294	800,535	—	—	—	—	—	—
1944	762	1,730,388	—	—	—	—	—	—
1945	215	565,313	—	—	—	—	—	—

Table 5 (c). — Japanese tonnage completed (steel ships, gross tons), 1946-1977.

Year	Domestic		Export		Total	
	No.	Tonnage	No.	Tonnage	No.	Tonnage
1946	399	130,191	—	—	399	130,191
1947	393	125,499	—	—	393	125,499
1948	838	172,915	2	840	226	173,775
1949	149	132,618	16	10,500	165	143,118
1950	173	270,130	23	98,240	196	368,370
1951	67	418,370	210	20,110	360	472,490
1952	59	360,778	47	164,953	232	541,076
1953	72	356,795	136	257,511	382	664,037
1954	76	239,166	101	149,843	391	430,392
1955	289	253,305	130	502,930	419	756,235
1956	404	513,947	102	1,267,111	506	1,781,058
1957	474	890,628	181	1,465,226	655	2,355,854
1958	605	861,592	117	1,209,216	722	2,070,808
1959	878	806,008	170	1,098,602	1,049	1,904,610
1960	1,487	922,663	104	884,548	1,591	1,807,211
1961	1,810	1,162,714	100	850,596	1,910	2,013,310
1962	1,460	1,423,985	93	905,162	1,553	2,329,147
1963	1,438	980,652	86	1,404,029	1,524	2,384,681
1964	1,366	1,357,475	173	2,833,824	1,539	4,191,299
1965	1,372	2,488,984	241	3,228,791	1,613	5,677,775
1966	1,703	2,796,953	292	4,094,532	1,995	6,891,485
1967	2,225	3,359,654	296	4,969,913	2,521	8,329,567
1968	2,641	3,680,531	288	5,370,001	2,929	9,050,532
1969	2,567	3,930,028	221	6,177,047	2,788	10,107,075
1970	2,369	4,260,243	240	6,291,391	2,609	10,551,634
1971	1,666	5,176,091	304	6,812,916	1,970	11,989,007
1972	1,755	5,553,449	261	7,280,618	2,016	12,834,067
1973	1,730	4,511,467	346	9,677,207	2,076	14,188,674
1974	1,232	2,657,435	554	14,883,552	1,786	17,540,987
1975	1,007	3,282,144	498	12,696,819	1,505	15,978,963
1976	1,123	2,889,683	535	11,355,512	1,658	14,245,195
1977	1,107	1,646,484	585	9,001,852	1,692	10,648,336

Source : 1946-1958 Ministry of Transport, Zosen Yoran 1960, p. 208.

1959-1977 MOT Statistics cited from *Nippon Sempaku Yushutsu Kumiai*, Zosen Kankei Tokei Yoran.

Table 6. — Ships completed by country of building (in thousands of gross tons).

Country of building	1950	1955	1960	1965	1970	1973	1974	1975	1976	1977
United Kingdom	1,389	1,322	1,298	1,327	1,067	1,198	1,170	1,500	1,020	
Belgium	55	81	123	116	149	230	256	201	211	132
Denmark	117	151	214	209	518	1,004	1,076	969	1,034	709
France	174	371	430	486	859	1,170	1,046	1,150	1,673	1,107
West Germany	—	966	1,124	1,035	1,317	1,926	2,142	2,499	1,874	1,595
Ireland	0	1	2	20	28	32	0	30	20	40
Italy	75	126	447	399	546	837	953	792	715	778
Netherlands	198	461	682	148	632	852	942	1,028	634	240
Japan	232	561	1,839	4,886	10,100	14,751	16,894	16,991	15,868	11,708
Norway	58	147	254	460	702	984	964	1,052	758	567
Poland	—	—	220	317	414	584	509	735	565	478
Spain	29	51	173	225	649	1,319	1,561	1,593	1,320	1,813
Sweden	374	508	710	1,266	1,539	2,290	2,181	2,188	2,515	2,311
U.S.A.	393	100	379	218	375	964	733	476	815	1,012
Yugoslavia	3	4	173	230	385	446	720	638	597	421
Other	—	—	316	468	1,439	1,953	2,365	2,692	3,814	3,600
World	3,254	4,967	8,382	11,763	20,980	30,409	33,541	34,203	33,922	27,532

Table 7 (a). — Japanese merchant ships (above 100 g.t.), 1890-1936.

Year	No.	Tonnage	Year	No.	Tonnage
1890	165	138,431	1914	1,103	1,708,386
1891	255	151,595	1915	1,155	1,826,068
1892	250	142,492	1916	1,151	1,847,453
1893	272	151,773	1917	—	—
1894	288	174,466	1918	—	—
1895	339	279,668	1919	1,418	2,325,266
1896	373	334,592	1920	1,940	2,995,878
1897	434	404,475	1921	2,033	3,354,806
1898	462	454,163	1922	2,026	3,586,918
1899	477	473,704	1923	2,003	3,604,147
1900	484	488,187	1924	2,055	3,842,707
1901	503	524,125	1925	2,087	3,919,807
1902	535	555,230	1926	2,087	3,967,617
1903	544	585,542	1927	2,035	4,033,304
1904	591	668,360	1928	2,048	4,139,815
1905	691	870,839	1929	2,059	4,186,652
1906	775	996,553	1930	2,060	4,316,804
1907	829	1,068,747	1931	1,969	4,276,341
1908	865	1,140,177	1932	1,964	4,255,014
1909	861	1,150,858	1933	2,019	4,258,159
1910	846	1,146,977	1934	1,949	4,072,707
1911	861	1,200,975	1935	2,146	4,085,650
1912	960	1,344,991	1936	2,367	4,215,690
1913	1,037	1,500,014			

Source : Lloyd's Register.

Table 8. — Re-organised structure of Japanese shipping in 1964.

Nucleus company	Companies merged	Ocean-going vessels (dwt)	Associate companies	Wholly- controlled companies	Total (dwt) tonnage
Nippon Yusen Kaisha	N.Y.K.	1,052,084	1,012,000	223,612	2,287,696
	Mitsubishi Kaiun		(7)	(6)	
Yamashita-Shin Nihon	Yamashita Kisen	570,031	415,865	136,528	1,122,424
	Shin Nihon Kisen		(4)	(9)	
Showa Kaiun	Nippon Yusosen	609,727	355,787	57,049	1,022,563
	Nissan Kisen		(3)	(6)	
Japan Line	Nitto Shosen	967,408	43,167	58,453	1,069,028
	Daidon Kaiun		(1)	(2)	
Kawasaki Kisen	Kawasaki Kisen	933,130	390,266	220,452	1,543,848
	Iino Kisen		(7)	(8)	
Osaka Shosen-Mitsui	Mitsui Sempaku	1,237,230	307,5772	773,533	2,318,335
	O.S.K.		(30)	(26)	
Tons dwt, total					9,363,894

Note : Figures in parenthesis show number of companies.

Source : R. FURUTA & Y. HIRAI, *A Short History of Japanese Merchant Shippin*, transl. D. MacFarlane, Tokyo News Service, Tokyo, 1966, p. 162.

Table 7 (b). — Japanese merchant ships (steel ships above 100 g.t.) (in thousands of gross tons).

Year	Cargo ship		Tanker		Total	
	No.	Tonnage	No.	Tonnage	No.	Tonnage
1937 (Dec.)	1,459	4,165	59	243	1,518	4,408
1938 "	1,594	4,735	72	304	1,666	5,039
1939 "	1,661	5,013	79	370	1,740	5,383
1940 "	1,735	5,305	84	378	1,819	5,683
1941 "	1,868	5,693	94	401	1,962	6,094
1942 "	1,720	4,940	101	427	1,821	5,367
1943 "	1,594	4,167	147	597	1,741	4,764
1944 "	1,438	2,757	267	824	1,705	3,581
1945 "	713	1,176	83	168	796	1,344
1946 "	727	1,213	86	172	813	1,385
1947 "	772	1,288	97	180	869	1,468
1948 "	825	1,358	97	197	722	1,555
1949 "	889	1,437	103	247	994	1,684
1950 "	828	1,431	116	281	944	1,712
1951 (Mar.)	830	1,517	121	314	951	1,831
1952 "	914	2,097	136	394	1,050	2,491
1953 "	921	2,340	150	478	1,071	2,818
1954 "	893	2,478	184	598	1,077	3,076
1955 "	917	2,579	220	674	1,137	3,253
1956 "	960	2,740	226	653	1,186	3,393
1957 "	1,075	3,121	246	739	1,321	3,860
1958 "	1,220	3,720	282	944	1,502	4,664
1959 "	1,361	4,261	348	1,151	1,709	5,412
1960 "	1,512	4,581	407	1,422	1,919	6,003
1961 "	1,837	5,077	539	1,597	2,376	6,674
1962 "	2,225	5,473	966	2,076	3,168	7,549
1963 "	2,438	6,058	966	2,627	3,404	8,685
1964 "	2,678	6,175	1,243	2,950	3,921	9,125
1965 "	3,508	6,660	1,566	3,642	5,074	10,302
1966 "	3,630	7,721	1,642	4,818	5,273	12,539
1967 "	4,119	9,317	1,668	5,694	5,787	15,011
1968 (Jun.)	4,445	10,899	1,678	6,634	6,123	17,533
1969 "	4,943	12,625	1,904	7,708	6,847	20,333
1970 "	5,754	14,832	2,113	8,883	7,867	23,715
1971 "	6,170	16,347	2,264	10,300	8,434	26,647
1972 "	6,265	18,709	2,370	11,722	8,635	30,431
1973 "	6,601	21,372	1,939	13,576	8,540	34,948
1974 "	6,741	21,269	1,926	15,751	8,667	37,120
1975 "	6,939	20,784	1,893	17,414	8,832	38,198
1976 "	7,100	21,195	1,864	18,301	8,964	39,496
1977 "	7,019	21,528	1,846	17,107	8,865	38,635

Source: 1937-1967 Japan Ministry of Transport
1968-1977 Japanese Shipowners' Association.

Table 9. — The seven major shipbuilding groups established in 1971.

Mitsubishi Jyukogyo (Mitsubishi Heavy Industries)
Mitsui Zosen (Mitsui Shipbuilding)
Sumitomo Jyukai Kogyo (Sumitomo Heavy Machinery)
Kawasaki Jyukogyo (Kawasaki Heavy Industries)
Hitachi Zosen (Hitachi Shipbuilding)
Ishikawajima Harima Jyukogyo (Ishikawajima Harima Heavy Industries)
Nippon Kokan (Japan Steel Pipe)

Table 10 (a). — Principal merchant fleets of the world, July 1, 1981.

Flag	No.	1,000 g.t.	1,000 dwt	%
Liberia	2,281	74,906	147,687	21.2
Greece	3,710	42,005	73,514	10.5
Japan	10,422	40,836	67,497	9.7
Panama	4,461	27,657	45,738	6.6
U.K.	2,975	25,419	41,273	5.9
U.S.S.R.	7,867	23,493	26,234	3.8
Norway	2,409	21,675	38,502	5.5
U.S.A.	5,869	18,908	28,582	4.1
France	1,199	11,455	20,112	2.9
Italy	1,677	10,641	17,429	2.5
Others	30,994	123,840	190,620	27.3
Total	73,864	420,835	697,188	100.0

Table 10 (b). — Principal merchant fleets of the world, July 1, 1985.

Flag	No.	1,000 g.t.	1,000 dwt	%
Liberia	1,808	58,180	113,552	16.9
Panama	5,512	40,674	67,267	10.0
Japan	10,288	39,940	63,451	9.4
Greece	2,599	31,032	55,356	8.2
U.S.S.R.	7,154	24,745	28,153	4.2
U.S.A.	6,447	19,518	28,993	4.3
Norway	2,219	15,339	25,721	3.8
China	1,991	14,896	22,615	3.4
U.K.	2,378	14,344	21,795	3.2
Italy	1,573	8,843	14,373	2.1
Others	34,426	148,758	232,416	34.5
Total	76,395	416,269	673,692	100.0

Note : These two tables first appeared in *Japanese Shipping*, published by the Japanese Shipowner's Association, London, during 1982 and 1986 respectively.

Source : Lloyd's Statistics.

Table 11. — Percentage of new orders placed.

Year	Japan %	South Korea %	E.E.C. %	Comecon %	Rest of world %	World total g.t.
1977	52.13	5.67	13.11	7.96	21.13	11,091,103
1978	43.25	3.71	14.89	11.49	26.66	8,025,679
1979	49.47	6.20	14.02	6.82	23.49	16,843,354
1980	52.66	8.96	12.11	4.22	22.05	18,969,044
1981	48.00	8.08	14.04 ^a	6.06	23.82	17,230,094
1982	49.75	9.57	13.47 ^a	9.44	17.77	11,231,759
1983	56.56	19.21	7.40 ^a	5.14	11.69	19,480,030
1984	56.73	14.69	9.95 ^a	3.75	14.88	15,593,541
1985	49.26	10.37	13.31	10.50	16.56	12,914,995
1986	42.98	23.95	12.63 ^b	7.32	13.12	12,800,000
	est.	est.	est.	est.	est.	est.

Notes : ^a Inclusive Greece.

^b Inclusive Greece, Spain, Portugal.

Source : Lloyd's Register, *Annual Report* 1986.

Explanations for Japan's original expansion

The state gave a high priority to ship-operating and, at a later date, attached considerable importance to the construction of its own tonnage. Subsidies were extensively used and were altered in accordance with changes in conditions in an extremely flexible manner. Thus at first support was given by providing an 8% guarantee on capital. This was then supplemented by payments for route mileage and, later, bounties were paid to encourage the improvement of quality, size and speed. These payments were concentrated upon the Shasen or regular lines (N.Y.K., O.S.K. and T.K.K.) which, in return, were required not to compete with one another but were obliged to provide services upon a number of ordered routes.

The organisation adopted by the independent owners and operators who lay outside this system (the Shagaisen) gave a great degree of flexibility to the remainder of the industry. This was linked into the needs of the Sogoshosha (or General Trading Companies) so that a tightly integrated network of mutual interdependence was established — Mitsui-Bussan was particularly important in this respect.

The impact of war also had beneficial consequences for the Imperial government was obliged to support the shipping industry at critical times in order to further its military policies. Thus all the vessels which were acquired to perform specific tasks during the Formosa Expedition, the Satsuma Rebellion, the Sino-Japanese War (1894) and the Russo-Japanese War (1904) were subsequently retained and utilised for commercial purposes — mainly by Mitsubishi or the N.Y.K.

The growth in overseas trade naturally provided many opportunities for Japanese shipping. Her exports of silk, coal and textiles supplied bulky cargoes before manufactured goods could be developed and these, together with the import of capital

equipment, food and raw materials, meant that the increase in cargoes was always ahead of the rise in the capacity of the Japanese merchant fleet. However, by 1913, this advantage was at an end for the proportion carried in the nation's vessels had already reached 50% which is the norm for trade between two countries of equal status and development (see Table 12).

Table 12. —Trends of foreign trade and shipping.

Year	Index (1013 = 100)				Japan's tonnage (1,000 g.t.)	Loading ratio of Japanese trade of Japanese ships (%)
	Volume of world trade	World tonnage	Volume of Japan's trade	Japan's tonnage		
1880			9	4	66	
1885			11	5	89	9.2
1890			19	9	143	10.7
1895			28	21	323	3.0
1900			40	34	519	30.7
1905			66	60	903	8.2
1910			75	89	1,343	45.7
1913	100	100	100	100	1,500	49.1
1914			91	113	1,708	56.9
1915			96	121	1,826	71.0
1916			109	123	1,847	72.8
1917			115	128	1,932	79.6
1918			124	159	2,397	87.9
1919			126	186	2,790	80.8
1920	83	122	116	199	2,996	72.2
1921	82	132	117	223	3,357	74.2
1922	92	135	144	239	3,587	42.0
1923	94	139	132	240	3,613	46.1
1924	106	134	155	256	3,849	61.9
1925	114	136	167	255	3,830	68.6
1926	115	136	176	262	3,939	66.4
1927	127	139	188	267	4,005	67.6
1928	130	143	187	275	4,084	67.4
1929	135	145	200	275	4,139	68.0
1930	126	148	176	283	4,248	66.4
1931	112	150	190	282	4,242	67.1
1932	101	148	201	278	4,177	65.9
1933	103	145	213	271	4,079	66.9
1934	112	140	241	269	4,044	
1935	118	136		271	4,073	
1936	124	139		283	4,250	
1937	141	141		310	4,658	

Source : KEIICHIRO NAKAGAWA, *Japanese Shipping in the 19th and 20th Centuries : Strategy and Organisation*, in : YUI and NAKAGAWA (eds), *International Conference on Business History*, 11, University of Tokyo, Tokyo, 1985, Table 1, p. 19.

By the First World War Japan's shipbuilders were technically efficient but, even with low labour costs, they could not compete with Western products on price. Output increased ten-fold during the war but immediately fell back to 1914 levels

once hostilities had ended. Thereafter production gradually increased but this was entirely for the domestic market. This virtually ended the need to import new vessels but there is no record of any Japanese exports during this period — costs were still consistently above world, especially British, prices.

The gains made by the operating companies during World War I were also quickly diminished but some were retained and others re-gained by a twin policy of using high-speed motor vessels on profitable routes and low-cost, sub-standard, vessels where this was more appropriate.

The Second World War was, of course, a disaster. Even so the strong connection which evolved with the United States after it had ended provided a useful springboard for later expansion. The value of the naval shipyard acquired by the American National Bulk Carriers Company cannot be over estimated for it enabled all of the wartime developments in technology to be made available to Japanese shipyards.

Japan's post-war success

This has *not* been caused by cheap labour or the absence of effective trade unions. Wage levels were originally very low and this certainly helped to counteract relative inefficiency in the early days. But pay rose sharply in the twenties and then fell back quickly in the thirties in response to changing economic circumstances.

It was also very low after World War II but since then has grown enormously, but only in line with productivity. They are currently (with by-annual bonuses) double the level of the U.K. Thus it would be true to say that they demonstrate a higher degree of plasticity than in many other countries.

The seafarer's trade union is not of the "house enterprise" type so despised in the West. It is, in fact, similar to many British industrial unions and has enjoyed great strength in the past. It can be very militant but has generally used its power in a flexible manner and has always responded to management arguments.

It should be remembered that only about 35% of the total work force are employed in the modern sector of the Japanese economy. Of these it is only the key workers who are employed on a life-time basis and who enjoy the full benefits which elsewhere are provided by a welfare state. Until recently little provision was made by the Japanese government for the remainder of the work-force but major reforms in this area have now been undertaken. Nevertheless, at a critical time of its development after the Second World War, Japan's resources were not diverted into welfare, or in the maintenance of huge armies overseas, and everything could be directed towards the expansion of productive capacity. The role of the sub-contractor, mentioned above, has also been an important factor in giving Japan's economy a high degree of flexibility.

Payment by seniority, typical of the Japanese modern sector, fragments the work force and prevents the unity which is the norm in most of the Western World. From the year of joining a firm on a permanent basis each employee receives an annual increment. This is dependent upon a number of factors including new skills, enthu-

siasm, team spirit, adaptability and is assessed by his peers as well as the company. Though annual differentials may be small, they build up over the years and after twenty years are considerable. Thus the natural leaders of the workforce were the very people who were very well paid and unlikely to act in a militant manner. The system also makes for considerable differences in the wages and salaries paid to the younger and older sectors of those employed.

Attitude of management

Typical, successful, Japanese executives appear to be hungry for further fields to conquer. But this is only true at the very top of U.K. management — most executives are content to leave their jobs behind them when they go home. Yet the skill of the management and its dedication affects all aspects of policy and its implementation. Great emphasis was placed upon industrial relations in Japan and this was clearly assisted by the desperate situation which prevailed in 1945. State priorities, as confirmed by public opinion, gave total priority to industrial projects and there was little need to satisfy the environmental and anti-pollution lobbies. The style of public enquiry favoured in Britain, which may delay vital decisions for years, are not employed. A typical example of the speed of Japanese reaction concerns the construction of Mitsubishi's Koyagi Yard which was built in Nagasaki Bay in under two years.

Attitude of government and society

The essence of Japanese progress would appear to be active state and municipal enterprise (not the example of Kobe), the co-operative efforts of labour and management, and the backing of a social structure which values their achievements. This situation was further enhanced by the consistent policy followed by the government which itself has been in power almost without interruption since 1947.

The importance of an unchanging civil service and the role of M.I.T.I. (the Ministry of International Trade and Industry) should be noted. The consequence has been a very flexible and well-supported structure which has helped the Japanese to respond very quickly to any changes which occur.

The future

SHIP-BUILDING

Japan's 33 $\frac{1}{3}$ % reduction in capacity, which took place in 1978-79, may not be enough. It is probable that she will have to accept a smaller role with South Korea and Taiwan taking larger shares of the market, albeit with Japanese capital and technology. Japan will also have to face much uneconomic production by Third World countries, including Brazil, and from selling under cost by the Soviet Bloc.

They do not have to be really concerned with British and other European producers, for it is likely that these will continue to be obliged to concentrate on specialisms such as oil rigs and naval work. It seems doubtful if Europe, or the United States, will ever be able to compete in the mass market again. It is virtually certain that the world market will be over-supplied for many years to come as ships are a particularly long-lasting and lumpy type of investment. However, this forecast may well be affected by changing levels in world trade. While this will obviously be influenced by changes in demand and supply which may well fluctuate over time, a new factor which will certainly reduce the size of cargoes is the impact of miniaturisation. This has already had a significant effect upon the tonnage of finished goods as well as on raw materials, and seems certain to make further inroads in the future.

SHIP-OPERATING

The high cost of labour will undoubtedly lead to ever larger proportions of advanced nations' fleets being placed under Flags of Convenience. Ever more reductions in manning levels and increasingly sophisticated ships will help, but may well be successfully imitated by the F.O.C. and Third World operators. As the same quality of vessel is available to all countries on roughly the same terms, the critical factor may be that of organisation. This is the only aspect in which the West is currently superior. Even with a co-operative trade union Japan is especially vulnerable and is gradually pricing itself out of this activity. Thus she is following the pattern set by the United States and the European countries, although Greece has shown one way that it is possible to survive.

It can be argued, of course, that wages form only a small proportion of total costs and that, with reduced crew sizes and a narrowing of differentials, this aspect will become less significant with the passage of time. Equally important in the longer-term way be the under-cutting of rates which is practiced by the Soviet Bloc in order to secure foreign exchange, for this can only be dealt with at government level.

Skilled management, organisation and teamwork may provide at least some answers to these problems for Japan and Britain but both appear to face bleak futures in ship-operating and in ship-construction. However, these unpalatable facts may not be entirely unproductive if new areas, where each country can enjoy a degree of comparative advantage, can be found and developed.