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DEPARTMENT OF COMMERCE

BUREAU OF FOREIGN AND DOMESTIC COMMERCE

E. E. PRATT, Chief

SPECIAL AGENTS SERIES—No. 114

NAVIGATION LAWS

COMPARATIVE STUDY OF PRINCIPAL FEATURES OF
THE LAWS OF THE UNITED STATES, GREAT
BRITAIN, GERMANY, NORWAY
FRANCE, AND JAPAN

Prepared by

GROSVENOR M. JONES

Commercial Agent

IN COLLABORATION WITH THE BUREAU OF NAVIGATION
AND STEAMBOAT-INSPECTION SERVICE



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LETTER OF SUBMITTAL.

DEPARTMENT OF COMMERCE,
BUREAU OF FOREIGN AND DOMESTIC COMMERCE,
Washington, January 12, 1916.

SIR: There is transmitted herewith a comparative analysis of the navigation laws of the leading maritime countries, namely, the United States, Great Britain, Germany, Norway, France, and Japan.

The purpose of this report is to present in comparative form detailed concrete information regarding the principal features of the navigation laws of the selected countries, with a view to indicating as clearly as possible the scope and character of the navigation laws of the United States as compared with those of other important maritime countries. Although the data are presented in comparative form, no deductions or conclusions have been drawn.

This analysis is believed to be the first of its kind published in this country and is designed to meet the present urgent need for adequate official information on the subjects covered.

The analysis is based almost entirely upon primary sources, namely, the laws, decrees, and regulations now in force in the selected countries. In addition, a number of valuable secondary sources, such as reports of special maritime commissions in Great Britain, and text-books and commentaries of recent publication, were drawn upon. Moreover, those parts of the text relating to their respective countries were submitted for revision and verification to the consuls general of France, Germany, Great Britain, and Norway, resident in New York City, and to the counselor of the Japanese Embassy in Washington. Parts of the manuscript were also submitted to other officials of these countries.

The preparation of this report has been under the immediate direction of Commercial Agent Grosvenor M. Jones, who outlined the inquiry and was assisted chiefly by Commercial Agent Herman G. Brock. Recognition should also be made of the cooperation of the Commissioner of Navigation and of the Supervising Inspector General of the Steamboat-Inspection Service, both of whom placed the facilities of their offices at the disposal of the Bureau and contributed a number of suggestions in the revision of the manuscript.

Respectfully,

E. E. PRATT,
Chief of Bureau.

To Hon. WILLIAM C. REDFIELD,
Secretary of Commerce.

NAVIGATION LAWS OF LEADING MARITIME COUNTRIES

Chapter I.—LAWS AFFECTING THE VESSEL.

1. REGISTRY OF VESSELS.

UNITED STATES.

To engage in trade at any port of the United States under the flag of the United States, all vessels of 5 tons burden and over must be documented. The laws of this country provide for the issuance of three classes of documents, namely, (1) certificates of registry, which are required for vessels engaged in foreign trade and the trade with the insular possessions of the United States, excepting Hawaii and Porto Rico; (2) enrollment and license, which is required for vessels of 20 tons burden and upward that are exclusively engaged in the coasting trade or fisheries of the United States; and (3) license, which is required for all vessels of 5 tons but less than 20 tons burden engaged in the coasting and fishing trades.

Vessels owned by American citizens have always been entitled to fly the flag of the United States without being documented and could be operated under the American flag in foreign waters. Such vessels could not, however, engage in any form of trade with American ports except under prohibitory penalties. An interesting statement regarding this feature of our navigation laws is contained in a recent annual report of the Commissioner of Navigation,¹ and reads as follows:

The first registry act of September 1, 1789, confined American registry to ships built in the United States. The right of American citizens, however, to own vessels built abroad has never been questioned, and was very clearly affirmed in the letter of Thomas Jefferson, Secretary of State, May 3, 1793. The policy of encouraging domestic shipbuilding adopted in the first years of the Republic had for its purpose the development of means of national defense rather than of protection of domestic industry in the sense in which these words are used in tariff discussions. To give effect to this policy, Congress at the outset passed legislation providing that only documented ships could engage in the trade of the United States, and divided these documents into three classes: First, the register for general purposes of trade and obligatory in foreign trade; second, the enrollment for vessels in the coasting trade; and third, the annual license authorizing a vessel for a year to engage in the coasting trade or in the fisheries, respectively.

Vessels over 5 and under 20 tons were required to carry the license only. Foreign-built vessels owned by Americans could not lawfully carry any of these documents, and, accordingly, could not engage in any form of trade with American ports except under prohibitory penalties. While this registry law doubtless contributed to the increase of American shipbuilding in the earlier years of the Republic, for the last third of a century it has been utterly impotent to promote building in the United States of ships for the foreign trade. Without discussing reasons, a statement of the fact will suffice that modern steel ships for some years have been built more cheaply abroad than they could be built at home. Consequently, American capital desiring

¹ Annual report for 1914, pp. 28-29.

to invest in shipping has for years past purchased ships abroad. These ships could have sailed under the American flag in trade with all parts of the world except with the United States, where they would have been met with heavy penalties whether with cargo or in ballast.

Registered vessels may engage in the coasting trade without being licensed and enrolled, but as a matter of fact they do not generally avail themselves of this privilege because of the higher pilotage fees imposed on registered vessels. Registered vessels in the trans-Pacific trade, however, carry cargo and passengers between Pacific ports of the United States and Hawaii, on their voyages between the United States and the Orient, and to this extent engage in the coasting trade.

Enrolled and licensed vessels "navigating the waters of the northern, northeastern, and northwestern frontiers, otherwise than by sea" are authorized to engage in the coasting or foreign trade on such frontiers without securing a certificate of registry.¹

The registration of a vessel is not compulsory upon her owner. It is a privilege or advantage of which he may or may not avail himself, as he chooses. The statute merely provides that vessels not registered pursuant to law, except such as shall be duly qualified according to law, for carrying on the coasting or fishing trade, shall not be regarded as vessels of the United States and shall not be entitled to the benefits and privileges pertaining to such vessels.

Registration under the American flag is restricted to vessels owned wholly by American citizens. A citizen may, however, be an entity like a corporation organized and chartered under the laws of the United States and of any States thereof,² and citizens of foreign countries may own stock in such corporations.

Prior to the passage of the Panama Canal act of August 24, 1912, and of the ship registry act of August 18, 1914, only American-built vessels were admitted to registry. The only exceptions to this rule were (1) vessels captured in war by citizens of the United States and lawfully condemned as prizes; (2) two foreign-built vessels belonging to the American Line, which were granted American registry on condition that the line build in American yards two others of the same speed and size and operate all four in a fast trans-Atlantic mail service in accordance with conditions stipulated in the mail subvention act of March 3, 1891; and (3) vessels wrecked on any of the coasts of the United States purchased by a citizen or citizens of this country and repaired in a shipyard in the United States or her possessions, provided the cost of repairs shall be at least three times the appraised salvage value of the vessel.

Section 5 of the Panama Canal act of August 24, 1912, effected what is probably the most radical change in the maritime policy of the United States since the early registry law of December 31, 1792. This section provided that any foreign-built seagoing vessel, whether steam or sail, not more than 5 years old, and certified by the Steamboat-Inspection Service as safe to carry dry and perishable cargo, might be admitted to American registry, if owned wholly by citizens of the United States or by corporations organized under the laws of the United States or any of the several States and having citizens of the United States as president and managing directors.

¹ Rev. Stat., 4318 (enacted June 17, 1864).

² Ibid., 4131.

Vessels admitted to registry under this act were not to be permitted to engage in the coastwise trade of the United States, but were to be eligible to the benefits of the mail subvention act of March 3, 1891.

The ship registry act of August 18, 1914, removed the limitation as to age and provided that the President could, whenever in his discretion the needs of foreign commerce might require, "suspend by order, so far and for such length of time as he may deem desirable, the provisions of law prescribing that all the watch officers of vessels of the United States registered for foreign trade shall be citizens of the United States," and that the President could "under like conditions, in like manner, and to like extent," suspend the provisions of law requiring survey, inspection, and measurement by officers of the United States of foreign-built vessels admitted to American registry under this act.

By Executive order of September 4, 1914, it was provided that, in the case of foreign-built vessels registered under the act, the requirements as to survey, inspection, and measurement should be suspended for two years from that date, and that such vessels might retain all their watch officers without regard to citizenship for a term of seven years, provided, however, that after a period of two years any vacancy should be filled by a citizen of the United States.

Another legislative enactment that was intended to facilitate the transfer of American-owned vessels from foreign to domestic registry was contained in the act of March 4, 1915. This law provided for the repeal of the statute imposing tonnage duties of 50 cents per ton and light money of 50 cents per ton on vessels which are owned by citizens of the United States but are not vessels of the United States, as well as the repeal of that portion of the tariff act of October 3, 1913, which imposed a discriminating duty of 10 per cent ad valorem on goods, etc., imported in such vessels. These duties, it is apparent, were in the nature of penalties. The act of March 4, 1915, was retroactive in its operation and provided for the refund of all tonnage duties, light money, or discriminating duties collected since the passage of the act of August 18, 1914.

In referring to the ship registry act of August 18, 1914, the Commissioner of Navigation, in his annual report for 1914, states that the extension of the scope of the act of August 24, 1912, came about directly after the outbreak of the European war, which "brought forcibly home to all the embarrassing situation in which we were placed by our own legislation. This legislation embarrassed us in the use of our own property at sea, which had been forced by it to employ flags and registers which conformed to statutes but not to actual ownership. Accordingly, the act of August 18, 1914, was passed. This act, though passed under stress of war, was in fact an inevitable development in the change of national policy which under ordinary conditions would have been effected as soon as Congress could have turned its attention to the subject."¹

It is interesting to note that, although this act was not passed until after the outbreak of the European war, legislation to the same effect had been recommended by the Secretary of Commerce as

¹ Annual Report of Commissioner of Navigation for 1914, pp. 29-30.

early as March, 1914, and a bill to the same end had been introduced in Congress.¹

Registration of a vessel under the laws of the United States is required to be made by the collector of customs in the customs district comprehending the port to which the vessel belongs at the time of her registry. This port is deemed to be that at or nearest to which the owner, or, if there is more than one owner, the husband or acting and managing owner of such vessel usually resides.²

The place of registry becomes a matter of importance in the case of corporations organized under the laws of a State other than that to or from which its ships operate. For example, to secure low incorporation fees and low corporation or excise taxes, as well as low personal property taxes, a company operating vessels on the Pacific coast may be incorporated under the laws of the State of Maine and may wish to claim Portland, Me., as the home port of its ships. The Commissioner of Navigation has, however, ruled that this can not be done, and this ruling has been sustained by the Supreme Court of the United States.³

The act of March 4, 1915, provides that consular officers of the United States and such other persons as may from time to time be designated by the President for the purpose, shall be authorized to issue provisional certificates of registry to vessels abroad which have been purchased by citizens, including corporations, of the United States. This provisional certificate entitles the vessel to the privileges of a vessel of the United States in trade with foreign countries or with the Philippine Islands and the islands of Guam and Tutuila and is valid until the expiration of six months from its date or until 10 days after the vessel's arrival at a port of the United States, whichever first happens, and no longer. On arrival at a port of the United States, the vessel becomes subject to American laws relating to officers, inspection, and measurement, as amended by the ship-registry act of August 18, 1914.

The law provides that "the Secretary of Commerce shall prescribe the conditions in accordance with which provisional certificates shall be issued and the manner in which they shall be surrendered in exchange for certificates of registry at ports of the United States."

Various documents are necessary to the proper registration of a vessel under the laws of the United States. A carpenter's certificate testifying that the vessel was built under his direction and containing descriptive details must be produced.⁴ The owner of a vessel or, if possible, the master, applying for registration must make oath as to his nationality and to the nationality of all the owners of the ship, if there be more than one.⁵ In the case of corporations, it is provided that the president or secretary or any other duly authorized officer or agent of the company, must swear to the ownership of the vessel without designating the names of the persons composing the company. The oath of an officer or agent is sufficient without requiring the oath of any other person interested and concerned in such vessel.⁶

¹ Annual Report of Commissioner of Navigation for 1914, p. 29.

² Rev. Stat., 4141 (enacted Dec. 31, 1792).

³ Southern Pacific Co. v. Commonwealth of Kentucky, 222 U. S., 63.

⁴ Rev. Stat., 4147.

As soon as the collector of the district comprehending the port to which the vessel belongs has satisfied himself that the requirements have been complied with, the facts of the registration are entered into the proper book and a certificate of registration is granted. This certificate contains a detailed account of the ownership, measurement, and construction of the vessel, and must be used only for the vessel for which it is granted, and may not be sold, lent, or otherwise disposed of to any other person.

GREAT BRITAIN.

"A ship is not deemed to be a British ship unless it is owned wholly by: (1) Natural born British subjects; (2) persons legally naturalized; (3) persons made denizens by letters of denization; and (4) bodies corporate established under and subject to the laws of some part of Great Britain and having their principal place of business in those dominions.¹

The British law does not require that vessels flying the British flag shall have been constructed in Great Britain or its possessions or that such vessels shall be officered by British subjects or manned by British crews made up in whole or in part of British subjects.

Every British ship not exempted is required to be registered. The exempted classes include (1) ships that have a net register tonnage not exceeding 15 tons and are employed solely in navigation on rivers or coasts of the United Kingdom or of some British possession within which the managing owners of the ships are resident and (2) ships with a net register tonnage not exceeding 30 tons that do not have a whole or fixed deck and are employed solely in fishing or trading coastwise on the shores of Newfoundland or parts adjacent thereto, or in the Gulf of St. Lawrence, or on such portions of the coasts of Canada as lie bordering on that gulf.²

In this connection it is interesting to note that under the accepted interpretation of the term "British ship," unless it is employed by a Government under marque, the nationality of the owner is generally the criterion of the nationality of a vessel, at any rate, in so far as regards the duties and liabilities of its owners and persons belonging thereto. Hence a British-owned ship is a British ship for such purposes, even if it is not registered in Great Britain, or if it is registered in and carries the flag of a foreign country.³

Under British laws, the act of registration is performed by registrars of British shipping, who are for the most part the chief customs officers in ports of the United Kingdom and the Channel Islands. In certain of the colonial possessions, however, the governor, the port officer, or some officer designated by the governor fulfills these duties.⁴

The port at which a British ship is registered for the time being is deemed to be her port of registry and the port to which she belongs.

Every registrar of British ships is required to keep a book called the register book, in which are entered the name and description of her owner or owners. A corporation must be registered as owner by its

¹ Merchant shipping act of 1894, pt. 1, sec. 1.

² Ibid., secs. 2 and 3.

³ The Merchant Shipping Acts; Temperley and Moore: second edition (1907), p. 2, citing the case of *Chartered Mercantile Bank of India v. Netherlands India S. N. Co.* (1883) 10 Q. B. D. 534-536.

corporate name. In addition to the information relating to the ownership of the vessel, there must also be entered in the registry book the name of the ship and the port to which she belongs, the tonnage details comprised in the surveyor's certificate, and the particulars respecting her origin as stated in the declaration of ownership.¹

Upon completion of the registry of a ship, the registrar grants a certificate of registry which comprises all the particulars that have been incorporated in the register book.²

Since the passage of the first British merchant shipping act in 1854, the British law has provided for the granting of a provisional certificate by British consular officers in the case of ships in foreign ports which become the property of persons qualified to own a British ship. Such provisional certificate has the effect of a permanent certificate of registry until the expiration of six months from its date, or until the ship's arrival at a port where there is a registrar, whichever first happens, and no longer.³

GERMANY.

The present law of Germany relating to registry of vessels is contained in the ship registry act of June 22, 1899, which took effect on January 1, 1900.

Vessels flying the German flag must be the exclusive property of German citizens. Regular partnerships and limited partnerships are considered as German citizens, if the personally responsible partners are all citizens of Germany; likewise, other commercial corporations, registered companies, and other legal entities if they have their headquarters in Germany, and limited partnerships with shares if all of their personally responsible stockholders are citizens of Germany.⁴

In this connection it is interesting to note that if an owner of an interest in a registered German vessel loses his citizenship, or if an interest in a vessel owned by a German citizen is transferred to a foreigner, otherwise than by sale (for example, by inheritance, the introduction of joint property in marriage, possession by limitation, and appropriation) the ship retains its right to fly the German flag for the period of one year.⁵

The registration laws of Germany do not require that vessels flying the German flag shall have been constructed in Germany or that such vessels shall be officered by German citizens and be manned in whole or in part by Germans.

A German vessel can be entered only on the register of shipping of that port from which the vessel is intended to be employed in navigation.⁶

Instead of the function of registration being performed by the customs officials in the various ports, as is the case in the United States and Great Britain, German registration is conducted by the district courts (*Amtsgerichten*) in the districts lying directly on the seaboard or on the highways for ocean shipping, which include the

¹ Merchant shipping act of 1894, pt. 1, secs. 5 and 11.

² *Ibid.*, sec. 14.

³ *Ibid.*, sec. 22.

Rhine as far as Cologne, the Elbe to Hamburg, the Weser to Bremen, and the Trave to Lubeck.¹

Upon completion of registry the district court issues a ship's certificate which attests the right of the vessel to fly the German flag, and is identical with the entry of the register. The entry in the register of shipping contains the following:²

1. The name and description of the vessel as well as its signal letters. These are a combination of four letters which is not disturbed by any change in the name of the home port of the vessel.

2. The results of the official measurements. Until an official measurement according to the German rules is made the results of a measurement by foreign officials are generally accepted.

3. The date and place of building so far as they can be determined.

4. The home port.

5. The name and particular designation of the owner. In the case of a shipping firm, the names and particular designations of each partner and the extent of the interest of each. In the case of corporations, registered associations, and legal entities, the firm name or the names of the individuals and the place at which the concern has its headquarters. In addition, for regular partnerships the names and the particular designations of all the partners; and for limited partnerships or those with sleeping partners with or without shares the names and the particular designations of all personally liable members or shareholders.

6. A statement that the legal requirements as to the citizenship of the parties have been fulfilled.

7. The legal title by which the ship or the several shares in the ship have been acquired.

8. Date of registry.

9. The serial number under which the ship is registered.

A provisional certificate of registry is granted, as in the case of United States and British vessels, to ships in foreign ports which become the property of a German citizen and thereby acquire the right to fly the German flag. This certificate is granted by the consul of the district in which the transfer of the vessel was made, and is valid for one year after date of issue and for such additional length of time as the voyage may be prolonged by act of God (*höhere Gewalt*).³

NORWAY.

Norwegian registry is restricted to ships owned exclusively by Norwegian citizens. In the case of a ship belonging to a stock company, the head office and the place of management must be in Norway, and the managers be Norwegian citizens and shareholders.⁴

All Norwegian decked sailing ships of 50 or more gross tons register and all Norwegian steamships of 25 or more gross tons must be entered in the register of Norwegian ships; men of war and other ships belonging to the State, not engaged in the carrying trade, are exempt. Ships of lesser tonnage are not to be entered in the register, but once having been entered, either provisionally or finally, they remain liable to registration even if on subsequent measurement it appears that the tonnage is below the limit.⁵

The register of shipping is kept by the officials in charge of the registration of mortgages for the district in which the home port of

¹ Gesetz, betr. das Flaggenrecht der Kauffahrteischiffe, vom 22 Juni 1899, sec. 4.

² Ibid., sec. 7.

the vessel is located, unless the King should, on account of special circumstances, provide otherwise.¹

The register must show the following information concerning each ship:¹

1. The date of registration.
2. Name, distinguishing letters, and description.
3. Place where built, if known, and home port.
4. Official measurement with gross and net tonnage according to the bill of measurement.
5. The name, domicile, and nationality of the owner, or if the ship belongs to several owners, the name, domicile, and nationality of each owner and of the managing owner, and the share held by each. If the ship or any share in the ship is owned by another company, the name of the company, its business office, and the name, nationality, and domicile of all of the members of the company, i.e., whether partnership or limited liability, with full information regarding the partners or shareholders.
6. The incumbrances on the ship or any share, with references to date and nature of the legal formalities connected therewith.
7. The title of the owners of the ship or the several shares, the date of their issues, the date of the schedule, registration, and other formalities.
8. Such other information as may be required by law.

Registration under Norwegian laws is required to be made by the collector of customs of the district comprising the home port of the vessel. Unless otherwise determined by the King, ports of entry only may be chosen as home ports of Norwegian ships subject to registration. Temporary registry may be granted a vessel provided such registration be duly entered in a special section of the register.

Various documents are necessary to the proper registration of a vessel under Norwegian laws, as follows:²

1. A bill of measurement and certificate of nationality duly certified by a Norwegian collector of customs, notary public, or consul. If no bill of measurement has been issued, then an attestation from the customhouse to the effect that the measurement has been made. If either the certificate of nationality or the bill of measurement is lost, a declaration to that effect in due form shall be attached.

2. A certified copy of temporary registry, if such may have been issued.

3. A certificate of origin and all title deeds, if the ship was formerly Norwegian owned. If a foreign-ship has become Norwegian property, then only the title deed by which such transfer was effected is required. A certified copy of these documents must be attached and handed over for safekeeping in the office of the registrar.

4. If there are any incumbrances, these must be duly noted.

5. If the ship belongs to a corporation, full information must be given; and if to a firm, full information about the members thereof, including the articles of association, etc.

6. An attestation that the ship is lying at a port of entry of Norway and that it can not be discovered that it has already been registered in the Kingdom. If the ship be in a foreign country a certificate from the consul may be substituted, supplemented by a Norwegian Government certificate as to not having been registered previously.

As soon as all the necessary papers are found to be in due form, registration is effected without delay, the ship being entered under four distinguishing letters which may not be altered as long as the

registration remains in force.¹ A certificate of nationality, which is the evidence of registration, is made out and delivered at once to the ship. In the case of a ship which has been acquired in a foreign country, a provisional certificate of nationality may be granted pending measurement under the Norwegian rule.²

When a change occurs in the nationality of the owners with the result that the ship ceases to be a Norwegian ship, her name shall be struck off only when after four months no notification shall have been given to the effect that the ownership has been so arranged as to prevent the ship from losing her right to carry the Norwegian flag.³

FRANCE.

French registry is accorded only to vessels at least 50 per cent of which is owned by French citizens. It is also specified that the captain, the officers, and at least three-fourths of the crew must be French subjects.⁴ An exception as to nationality of the crew is made in the case of vessels operating in the Far East. (For details see pp. 78-79 of this report).

Since in the case of vessels belonging to corporations, it is difficult to make certain that the required conditions of ownership are being fulfilled, the customs administration, acting under a decision of the Conseil d'Etat dated April 15, 1887, grants corporations the benefits of French registration only provisionally and upon the condition that the director must prove his qualifications as a director and as a French citizen, and likewise prove that the vessel is actually owned by the society of which he is a director.

The law of April 7, 1902, stipulates that joint stock companies (*sociétés anonymes*) or other legal entities, owning vessels that receive one of the subsidies provided for by this law, must have a majority of French citizens in their executive board, or board of directors, and that the president of the board of directors, the managing director, and the manager of such corporations must be French citizens.⁵

Since the special requirements as to the nationality of the officers and directors of corporations receiving subsidies under the law of April 7, 1902, offered an easy solution of problems regarding the nationality of vessels owned by corporations and registered under the general registration laws, it was decided to incorporate these special requirements in the general registration laws. This was accomplished by a circular of instruction issued January 26, 1910, by the Customs Service. The universal rule now is, therefore, that all corporations applying for French registers must show that the president, managing director, and manager, as well as a majority of the board of directors, are citizens of France.⁶

The port to which a French vessel belongs and where it registers is deemed to be its legal domicile.⁷

¹ Law of May 4, 1901, on registration of ships, sec. 6.

² *Ibid.*, sec. 7.

³ *Ibid.*, sec. 16.

⁴ Art. 2 of the law of Sept. 21, 1793, as modified by law of June 11, 1845.

⁵ Loi du 7 avril 1902 sur la Marine Marchande, chap. 1, art. 1.

The French certificate of registration is granted at the office of the Maritime Registrar, after the required conditions have been fulfilled. It specifies the facts which establish the identity of the ship, the changes which it has undergone, the measurements, the mortgages which encumber it, etc., and is delivered only upon a warranty that the owner will not gratuitously sell, lend, or alienate the document.¹

The French law specifies three circumstances under which a vessel forfeits its register: (1) By refitting and repairing in a foreign country at a cost of more than 15 francs (\$2.90) per ton, unless in case of necessity that is approved in a report signed by the captain and officers and also (according to the facilities which may exist in the port in which such refitting took place) by the consul or any other French official, or by two merchants of the place; (2) by the alteration in build, or tonnage, or in any other respect, without obtaining a new certificate of French registration; and (3) by the sale to a foreigner of the whole or more than one-half interest in the ship.²

Coastwise trade between customs districts, that is, the transportation of goods between ports in continental France, is restricted to French ships. This privilege, which is of marked benefit to French shipping, was established by the law of September 21, 1793.

For a long time an exception to this rule was made in favor of Spanish ships by virtue of the treaty of August 15, 1761, known as the Family Agreement, and renewed by the treaty of Paris in 1814. The privilege thus conceded to Spanish ships was removed by the treaty of December 8, 1877.

The treaties of June 13, 1861, and November 3, 1881, made, on the basis of reciprocity, an exception in favor of Italian steamships for all the Mediterranean ports of France and Algeria. This exception, however, has ceased to exist, since the commercial treaties with Italy expired July 16, 1886, and have not been renewed.

Another privilege accorded to French shipping is the limitation to ships of French registry of the entire trade between France and Algeria. This restriction is contained in the laws of April 2, 1889, and its purpose is not only to secure an increase of freight for the French merchant marine, but also was to bring Algeria closer to continental France. This statute was modified by article 1 of the law of July 22, 1909, which provides that this restriction may be suspended provisionally by decree in emergencies.

Finally, fishing in the territorial waters of France and of Algeria is reserved, under the law of March 1, 1888, and the decree of August 19, 1888, to French boats for a distance of three marine miles from the coast.

JAPAN.

The general laws relating to the registration of Japanese ships are to be found in articles 538 to 541 and 555 of Book V of the Commercial Code of Japan.³

Article 540 of the code provides that "the shipowner must according to statutory provisions make a registration of the ship and apply

¹ Loi du 27 vendémiaire, An II, art. 16, as modified by the law of June 9, 1845, art. 11.

² Loi du 27 vendémiaire, An II, art. 16, as modified by law of Apr. 7, 1902, art. 15.

for a certificate of its nationality." This regulation has no application, however, to ships of less than 20 tons register or less than 200 koku.

The detailed laws relating to registration are to be found in the law of ships, enacted March 7, 1899, and in special administrative regulations pertaining thereto. Article 1 of this law provides as follows:

A ship is a Japanese ship:

1. If it belongs to a Japanese public authority.
2. If it belongs to a Japanese subject.
3. If it belongs to a commercial company having its principal office in Japan; provided all the partners in the case of an ordinary partnership, all the partners with unlimited liability in the case of a limited partnership or a joint-stock limited partnership, and all the directors in the case of a joint-stock company are Japanese subjects.
4. If it belongs to a juridical person having its principal office in Japan, provided all its representatives are Japanese subjects.

A ship belonging to a limited partnership formed before the Commercial Code took effect is a Japanese ship, if all the managing partners are Japanese subjects.

A ship loses its Japanese nationality if an alien becomes one of the coowners, or partner in an ordinary partnership, or one of the partners with unlimited liability in a limited partnership or in a joint-stock limited partnership owning the ship. If the ship belongs to a corporation (*société anonyme*), all the directors must be Japanese citizens, otherwise the ship will become a foreign ship. However, the transfer to an alien of shares in a joint-stock company does not affect the nationality of the ship, unless the alien is appointed a director.¹

The law of ships provides further that only Japanese ships may enter Japanese ports other than open ports or carry goods or passengers between Japanese ports unless otherwise provided by law or treaty or to avoid perils of sea or capture (Art. 3). The Minister of Communications may, however, give a special permit to the contrary.

Every Japanese ship must have a home port, which is selected by the owner, and must be registered and measured in the district to which that port belongs. (Art. 4.) The law of ships provides for provisional certificates of nationality for ships acquired in foreign ports, but such certificates are invalid after one year, or when the ship returns to its home port before the expiration of such period. (Arts. 15, 16, and 17.)

Only registered vessels are allowed to operate under the Japanese flag, except in the cases of sailing vessels of less than 20 tons gross, or of less than 200 koku capacity, boats or vessels of any kind propelled wholly or principally by sculls or oars, hulks and laid-up vessels, and sailing vessels employed solely in navigating smooth-water routes.

Foreign-built ships may, if owned by Japanese citizens, be granted Japanese registration, but only vessels built in Japan and owned by Japanese citizens can engage in the ocean trade receiving subsidies under the ocean lines subsidy act of March 25, 1909.

On January 1, 1912, the policy of free registration of ships was instituted in the Japanese leased territory of Kwantung (Dalny, Port

¹ The Commercial Code of Japan, translated by Yang Yin Hang. No. 1, University of Pennsylvania Law School Series. 1911. See also translation by Dr. L. H. Loenholtz. Commentator's note on art. 555.

Arthur) in the port of Dairen. As Dalny is a free port without import duties, the advantage of having foreign-bought ships registered at Dairen is important, and an increasing number of ship-owners have established bureaus and agencies in Dairen with the chief purpose of saving the high fees charged in Japan for registration. In March, 1914, however, the Government placed a tax of 30 sen (15 cents) per net registered ton on ships domiciled at Dairen, but this tax is still relatively very small in comparison with the taxes charged in Japan.¹

2. MEASUREMENT OF VESSELS.²

INTRODUCTORY.

Three methods of measuring the capacity of a ship are in more or less general use by the maritime world, as follows: (a) By displacement tonnage, (b) by dead-weight tonnage, (c) by register tonnage.

The displacement tonnage of a ship signifies the weight of the volume of water which the ship will displace when fully loaded with all her crew, coal for steaming purposes, supplies, etc., on board. Measurement in terms of displacement tonnage is in general use by the navies of the world and assures absolute accuracy and uniformity. The displacement system is not, however, adapted to merchant vessels, since the amount of cargo and the number of passengers on board may vary greatly from voyage to voyage on the same ship.

Dead-weight tonnage is a statement of the actual weight of the cargo which a merchant ship can transport. It is adapted and applied only to vessels that carry homogeneous bulk cargoes, and plainly could not apply to a passenger vessel or to a vessel carrying miscellaneous cargoes.

Register tonnage is expressed in terms of gross tonnage and net tonnage. Displacement tonnage includes, as indicated, the avoirdupois weight of both the ship itself in the water and everything on board. Dead-weight tonnage covers only the avoirdupois weight of the cargo which a ship can carry. Neither of these systems is adapted to the varying and multiform requirements of sea-borne commerce, and the third method—register tonnage—is the most satisfactory system of measurement.

Gross register tonnage.—The present rules or methods for determining the gross tonnage of vessels originated with Mr. George Moorsom, of England, and were first embodied in law in the British tonnage act of 1854. The Moorsom rules for the measurement of vessels have since been adopted by practically every maritime country, although the practice of the several countries as to the exemption and measurement of spaces within vessels is far from uniform.

The following concise account of the Moorsom system of measurement is taken from the report of Prof. Emory R. Johnson upon the measurement of vessels for the Panama Canal (pp. 45-46):

Prior to 1854 vessels were measured by brief rules which produced only approximately correct results. Those in force in England were established by the "new

¹ Dr. W. Müller: Entwicklung und gegenwärtiger Stand der überseeischen Dampfschiffahrt in Japan.

measurement" law of 1836. The need for improvement in the rules having become evident, the commissioners of the Admiralty, at the request of the Board of Trade, appointed a committee in 1849 to recommend changes in the rules. The following year this committee recommended that the contents of vessels should no longer be determined by internal, but by external, measurement. Mr. Moorsom was honorary secretary of this commission, but did not approve of its recommendation. When it became evident that the report of 1850 was not to be accepted, Mr. Moorsom formulated the measurement rules which now bear his name. These rules were approved by the Board of Trade and made law by act of Parliament.

Mr. Moorsom worked out an exact mathematical method or formula for determining the cubical contents of vessels, and the ships then registered under the British flag were measured by these rules. It was found that the cubical contents of the entire British merchant marine was 363,412,456 cubic feet. At that time the total registered tonnage of the fleet was 3,700,000. The ratio of the number of cubic feet of contents to the number of tons registered was 98.22 to 1. It was the desire of the British Government to make as little change as possible in the registered tonnage, and it was accordingly suggested by Mr. Moorsom that in order to simplify calculations 100 cubic feet instead of 98.22 should be considered a gross ton. This suggestion was adopted.

Mr. Moorsom's recommendations regarding measurement rules and tonnage were embodied in rules 1, 2, and 3 of the British tonnage act of 1854. * * * Rule 1 prescribes a method for measuring empty vessels, Rule 2 states how laden vessels shall be measured, and Rule 3 prescribes the rules to be followed in measuring the space occupied by the engine and machinery of steamships. In their present form the rules differ only in minor respects from those originally formulated by Mr. Moorsom.

The first country to follow England in the adoption of the Moorsom system of measuring spaces and the Moorsom ton was the United States, which embodied them without change in the act of 1864. The Suez Canal Co.'s measurement rules were formulated by the International Tonnage Commission, which met at Constantinople in 1873. These rules provided that the gross tonnage of vessels shall be determined by the Moorsom system and be expressed in Moorsom tons. Thus, by the action of the International Tonnage Commission and by the laws of the United States and other countries, a vessel ton is everywhere 100 cubic feet, and the contents of vessels are determined by the Moorsom system of measurement. The rules, however, concerning the spaces that shall be included in gross tonnage vary with different countries, and the regulations of the Suez Canal Co. are different from nearly all the national rules.

Dissimilarity in the several measurement codes is due to the fact that some include spaces which are exempted by other rules. Thus the same ship would not have the same measured contents and would not have the same gross tonnage by British, American, and Suez rules. * * *

In discussing the measurement of vessels to determine their gross and net tonnage it is necessary to keep in mind the distinction between "exemption" and "deduction" from measurements. Measurement rules stipulate what spaces shall be measured to determine a vessel's gross tonnage and what part of the vessel shall be exempted from measurement, while the rules governing the determination of net tonnage specify which of the spaces have been measured shall be deducted. Net tonnage, as will be explained later in detail, is ascertained by deducting from the contents of the spaces that have been measured and included in gross tonnage the contents of such spaces as the rules designate shall not be included within the net tonnage of the vessel. The gross tonnage of a vessel depends upon the spaces exempted from and upon the spaces included within the measurement, while a ship's net tonnage is affected by the specifications of the rules as to the exemption of spaces from measurement and as to the deductions to be made from the spaces included within the gross tonnage. The rules regarding the measurement and exemption of vessels control the gross tonnage and indirectly determine the net tonnage of vessels.

The variations in the rules governing gross tonnage and in the regulations or instructions issued for the guidance of measurers in applying rules result mainly from the different interpretations that have been put by law and practice upon the terms "closed-in" and "open" spaces.

The Moorsom system aims to ascertain the entire cubical space of a merchant vessel. This is accomplished, first, by measuring the

in smaller vessels. The tonnage deck in vessels having three or more decks to the hull is the second deck from below, while in vessels having only one or two decks the upper deck is regarded as the tonnage deck. The length, breadth, and depth of the space under the tonnage deck are measured and the cubical contents are ascertained therefrom. This product in cubic feet is divided by 100, 100 cubic feet being arbitrarily taken as the unit and termed a "ton" in all measurements of merchant vessels. The registry ton means 100 cubic feet and not the ton avoirdupois of 2,240 pounds, as in measurement by displacement or dead-weight.

After the space below the tonnage deck has been ascertained, the cubical contents of the space between that deck and the deck above, usually called the main deck, is ascertained in the same manner. Then the cubical contents of the space between the main deck and the upper deck is measured in the same way. These ordinarily constitute the hull of a ship, and by adding the different amounts the cubical contents of the entire hull are ascertained. On the upper deck, at the forward part of the vessel, a forecastle is frequently built and closed in as quarters for the crew. On the stern of the vessel a similar structure, called the poop, is often erected for various purposes.

The cubical contents of these structures are ascertained and added to the hull tonnage, and the total is the gross tonnage of the ship.

Net register tonnage.—The entire cubical contents of a ship are not, of course, available for carrying passengers and cargo. A certain amount of space on all vessels, sail or steam, must be set apart as quarters for the officers and crew. If these spaces were permanently included in the tonnage of the ship, on which taxes of various descriptions and for various purposes are collected, the builders and owners of ships might be disposed to make them as small as possible. To check such a tendency and to encourage the building of ample forecastles or crew quarters, nearly all maritime nations and municipalities provide that taxes shall not be collected on the gross tonnage.

A considerable proportion of the gross tonnage of a steamship is occupied by engines, boilers, and machinery. These spaces are not available for either cargo or passengers, and the same is true of the coal bunkers of a vessel. Accordingly, all maritime nations now provide for the separate measurement of the spaces set apart for the engines, machinery, and boilers, for the steaming coal, and for certain other minor spaces, such as those which inclose the steering gear below deck, the boatswain's stores, chart house, donkey engine, and sail room.

The substitution of steel for wood as the chief material of marine construction has rendered it possible to construct ships with double bottoms. The space in the double bottom may be used to carry water as ballast. This form of construction adds to the safety and economy of the vessel, and it is, therefore, the universal rule to exempt from dues and taxes the space between the two hulls or bottoms.

The sum of all these exempted spaces is deducted from the gross tonnage and the remainder is called the net tonnage. This remainder, theoretically, is the portion of the ship which produces income

by its capacity to carry cargo or passengers. Some kinds of cargo, which will not be injured by the rain or by the waves, such as lumber, steel girders, machinery, cattle, and horses, are carried at times on the open deck. Sometimes canvas may be stretched as an awning over live stock, when wind and weather permit, and sometimes more permanent awnings of boards or light steel are erected over deck cargo. To measure deck cargo it is necessary to measure the space it occupies and, since this varies, it should not be added to the gross tonnage, though properly it may be taxable.

GROSS-TONNAGE RULES.

UNITED STATES.

The Moorsom system of measuring vessels to determine gross tonnage was adopted in the United States by act of May 6, 1864.¹ This system as adopted was practically the same as that established in Great Britain by the merchant shipping act of 1854. The act of 1864, however, made provision only for the determination of gross tonnage, which, until 1882, was the base upon which tonnage taxes and other ship charges were levied at American ports.

The spaces included in measurement and the spaces exempted therefrom by the law of 1864, as interpreted by the measurement authorities in the United States, were the same as the spaces measured and exempted under the rules of the British Board of Trade prior to the modification of those rules made necessary by the decision of the House of Lords in the *Bear* case in 1875.

The act of May 6, 1864, was amended by the act of February 28, 1865, which provided that "no part of any vessel shall be required * * * to be measured or registered for tonnage that is used for cabins or staterooms, and constructed entirely above the first deck, which is not a deck to the hull."²

The Customs Regulations of the United States state that this amendment "was designed merely to exclude cabins and staterooms above the promenade deck of the steamers of the seacoast and lakes, or above a boiler deck as used on the western rivers. It does not have the effect to exempt from admeasurement any closed-in place, even if so situated, if used for cargo or stores."³

Although the amendment of February 28, 1865, was enacted with reference to coastwise, lake, and river steamers, it was also applied to ocean steamers. Thus in the case of modern passenger steamers which have several tiers of passenger accommodations above the upper deck only the first tier is measured. This rule regarding upper tiers of superstructures, it is believed, prevails in no other country.

The later development of the gross-tonnage rules in the United States is described in the following extracts from the Annual Report of the Commissioner of Navigation for 1915 (pp. 44-46):

Two rules have long been in use for determining the allowance to be made for propelling power and fuel—one known as the Danube rule, the other as the British or Board of Trade rule. These two rules, and in fact the entire subject of measurement of vessels, were considered at some length in the report of this Bureau for 1911 (pp. 24-42). Without going into details, the Danube rule in the case of most ships makes

¹ Rev. Stat., 4153.

² Ibid., 4151.

³ Customs Regulations of the United States (1908), arts. 71-87.

a smaller allowance for propelling power, including fuel, than does the British rule. The Danube rule has been adopted by the administrations of the Panama and Suez Canals. The British rule, however, is in general use at this time by maritime nations. Our measurement act of 1882 adopted the Danube rule and accordingly American steamers were at some disadvantage as compared with the steamers of most maritime powers in the matter of measurement.

The Frye Measurement Act of March 2, 1895, adopted for the United States the British rules for measuring propelling power and in other respects brought our law into accord with prevalent maritime practice. Administrative officers, however, in different countries, or in the same country, have not always put the same construction upon usual words in the vocabulary of marine architecture, such as "upper deck," "permanent closed-in space," "sheltered spaces," "under cover," and "open to the weather." These differences of interpretation have arisen mainly in vessels with "shelter decks."

During the seventies it was the practice to carry cattle, exported from this country, in temporary wooden stalls on the upper deck, with wooden and canvas screens and awnings, a system involving at times suffering and loss to the cattle and risk to the cattle attendants, as well as high insurance and high freight rates. In the course of a short time the steel sides of the ship were carried up to a level with the top of the forecastle and the bridge house and the space covered over with planks resting upon transverse and lateral steel beams, steel doors being left in the sides for the ingress and egress of the cattle. Later a steel cover or shelter was substituted for the planking and still later a continuous steel structure was built, which, to the untrained eye overlooking the load-line mark, was not distinguishable from the hull of the ship and upon the steel shelter of which one could pass as on an upper deck. Of course, shelter-deck ships are not confined to the trade in live stock. This short statement of the genesis of shelter decks may suffice to show the reasons for differing opinions as to whether such spaces are in fact "permanently closed-in" or are "open to the weather." Under the law, such spaces, if permanently closed in, should be added to the gross tonnage of the ship. If not regarded as permanently closed in, they should not be added to the gross tonnage.

The tendency of the British rules (see report for 1914, p. 27) has been to exclude such spaces from the measurement of the ship. The British rules, however, provide that all cargo carried in such spaces shall be treated as deck cargo, and in the imposition of port charges and other dues the space thus occupied is taxable. Our own regulations were more nearly in accord with the Suez and Panama rules, tending to regard such spaces as "closed-in." As the American law contains no provision for the assessment of dues on deck cargo, like the British, the interpretation mentioned tended toward uniformity. It may be added that up to the passage of the ship registry act of August 18, 1914, there were practically no American shelter-deck ships, and the differences in interpretation of the words mentioned, accordingly, did not in fact affect adversely more than possibly half a dozen American steamers. This difference, however, may perhaps have operated against the construction of shelter-deck ships in this country, though so far as is recalled no complaint to this effect was filed with this office. With the passage of the ship registry act of August 18, 1914, the interpretation of this rule, however, did become a matter of construction and instructions to measuring officers were issued, giving to the words quoted above the interpretation which they receive under the British rules.

As the measurement laws and regulations of the United States stand to-day, the tonnage basis for charges on an American ship are no greater than on a foreign ship, and in some cases they will be materially less, in the following respects:

1. The American law imposes no charges on deck cargo similar to the British charges.

2. Spaces adapted only for water ballast (other than the double bottoms) are not included in gross tonnage under the act of February 6, 1909, while they are so included under the British system. Double bottoms for water ballast have not been included in the gross tonnage since the act of March 2, 1895, which accords with the general practice of maritime nations.

3. Under section 4151 of the Revised Statutes no part of a vessel that is used for cabins and staterooms and constructed entirely above the first deck, which is not a deck to the hull, is included in the gross tonnage.

4. The deductions for propelling power, under the British act of 1907, can not exceed 55 per cent of the gross tonnage after certain minor spaces have been subtracted. Our law contains no such limitation on the deduction for propelling power.

The suspension of the measurement laws and regulations provided for in section 2 of the ship registry act of August 18, 1914, was construed as the instruction of Congress to bring existing regulations as to shelter decks more closely into accord with the British and other regulations on this point. On September 5, 1914, collectors were advised to notify the owner of any seagoing American steamer that he could apply for a revision of measurement on the ground that sheltered places with openings at the sides or ends had been included in the tonnage. On March 16, 1915, revised regulations on shelter decks were issued, and on July 13, 1915, these modifications were carried into a general revision of the measurement regulations, printed in a separate pamphlet together with the Suez Canal rules. A special form of certificate in accord with the Suez rules was also issued for American ships which may make use of that canal.

A detailed statement regarding the spaces included in the gross measurement of American vessels is contained in Appendix A, at page 167 of this report.

GREAT BRITAIN.

The present rules of the Board of Trade governing the measurement of vessels are in accordance with the merchant shipping acts of 1894, 1906, and 1907, and are so drafted as to conform to the decisions rendered by the House of Lords and the British courts in 1875 and later, defining what constitutes open spaces within the meaning of the merchant shipping act of 1854. A summary of the gross measurement rules now in force in Great Britain is given in Appendix B, together with a list of the spaces that are exempted from measurement and thus not included in the gross tonnage under the British rule, is given in Appendix C.

GERMANY.

The rules in force in Germany for the measurement of vessels were established by the imperial statute of January 5, 1872. Previous to that time the several German States had dissimilar rules, but none of them had the Moorsom system of measurement, which was adopted by the imperial law of 1872. The provisions of the act of 1872 have been modified from time to time. The law as it now stands stipulates that gross tonnage shall "include the spaces located under the uppermost deck of the ship and permanent superstructures on or above the uppermost deck."

In the gross-tonnage measurement of vessels measured according to the present German laws are included: (1) The spaces under the tonnage deck and between the tonnage and upper decks; (2) the space occupied by all covered and inclosed superstructures permanently erected on or above the first deck which are inclosed by substantial bulkheads and coverings suitable for the stowage of freight or merchandise or for quarters or other accommodations of the crew and passengers; and (3) hatches in excess of one-half of 1 per cent of the gross tonnage.

The technical directions issued by the German Government to its surveyors of ships as to the measurement of closed-in and open spaces under the shelter deck and in superstructures are more detailed and specific than the instructions given by the Board of Trade to British surveyors; but the German rules appear to be applied in such a way as to produce practically the same results as are secured by the British surveyors in applying their rules. In one particular the German rules are more lenient toward shipping than the British

rules. Deck cargoes are not measured in Germany. In neither country are deck cargoes included in the register tonnage; but in Great Britain the space occupied by deck cargoes is measured and added to the tonnage upon which light dues and other port charges are levied.

An excellent comparison of the principal requirements of the gross-tonnage rules of the United States, Great Britain, and Germany is given by Prof. Emory R. Johnson in his authoritative and comprehensive report¹ on this subject, and the tabular enumeration which he has prepared in this connection is reproduced in Appendix C of this volume.

NET-TONNAGE RULES.

UNITED STATES, GREAT BRITAIN, AND GERMANY.

In determining net tonnage no spaces are deducted that have not been included in gross tonnage. The rules of the United States, Great Britain, and Germany vary as to the inclusion and exemption of spaces within gross tonnage. This affects the spaces that may be deducted to determine net tonnage. If the deductions were the same under all the rules, the resulting net tonnages would be dissimilar, because of the variance in the rules as to gross tonnage.

The British, Suez, German, and American rules concerning deductions for spaces other than those used for propelling power contain so many details that it has seemed advisable to include in Appendix D the tabular form (prepared by Prof. Johnson) which summarizes these provisions. This table shows in comparative form how the several spaces used for navigation, for the accommodation of the crew, and for stores are dealt with in each set of measurement rules under consideration.

GROSS AND NET TONNAGE RULES.

NORWAY.

The law of May 31, 1873, prescribes that every Norwegian ship which has a tonnage of 4 tons or more shall be measured and furnished with a bill of measurement. The only ships exempted from this rule are men-of-war and other Norwegian ships that belong to the State and are not engaged in the carrying trade. The tonnage of a ship is computed in Norway in tons equal to the British register tons.

The so-called English measurement of ships (the Moorsom method) was introduced into Norway by the law of May 31, 1873, which is supplemented by the Royal Instructions of November 6, 1875, the only difference being that the deduction of engine space was to be computed according to the German rule. This difference was removed, however, by the royal decree of September 14, 1893, which adopted the English rule for the deduction of engine space and amended the regulations regarding the deduction for crew space. At the present time the measurement of Norwegian vessels is conducted entirely according to the English rule.²

¹ Measurement of Vessels for the Panama Canal, pp. 60-61.

FRANCE.

The tonnage or burden of French vessels is expressed in three ways, as follows:

1. Total gross tonnage, which is the interior capacity of a vessel with additions for the capacity of all structures erected on the deck. Total gross tonnage is taken into consideration in the calculation of bounties on French vessels.

2. Gross burden or tonnage, which is the total interior capacity of a vessel with deductions for the spaces occupied by auxiliary equipment, water ballast, cookrooms, etc. The law of April 17, 1907, on the security of maritime navigation and the organization of work on board ships classified vessels according to their gross tonnage.

3. Net or registered tonnage, which is the total interior capacity of a vessel with deductions for spaces used for passengers, cargo, engines, coal bunkers, quarters of officers and crew, etc. This tonnage indicates the capacity for carrying merchandise and passengers.

An excellent discussion of the French laws and regulations on the measurement of vessels is given in Volume I of a recent work of Georges Ripert, professor of law in the University of Aix-Marseille, on "Droit Maritime" (pp. 231-235). The following statement is taken from the discussion:

When the tonnage of a ship is spoken of, allusion is nearly always made to its gross tonnage. This tonnage corresponds most nearly to the external dimensions of the ship, and, consequently, distinguishes one ship from another. From a commercial point of view, however, the net tonnage is more important. This tonnage serves, moreover, for the calculation of the fiscal taxes that are considered as shipping charges (local dues, sanitary charges, etc.).

The relation between net tonnage and gross tonnage varies with the class of ship. On sailing vessels and cargo ships the net tonnage is more nearly the same as gross tonnage than in the case of passenger vessels; for example, the passenger steamer *Provence* has a total gross tonnage of 14,744, a gross tonnage of 13,753, and a net tonnage of 3,834; while the cargo steamer *Saint Laurent* has a gross tonnage of 5,607 and a net tonnage of 3,556; and the sailing vessel *Antoinette* has a gross tonnage of 2,898 and a net tonnage of 2,612.

From a commercial point of view, the dead-weight carrying capacity of a ship is sometimes indicated. This expresses in metric tons the total weight the ship can carry.

The calculation of the interior capacity of a ship and of the deductions can be made only approximately. The complexity of the divisions and the irregularity of the lines of the ship permit an exact calculation only with very great difficulty. The methods of calculation are not the same in all countries.

In France the tonnage was formerly computed by the custom officials according to the method fixed by the law of 12 Nivose of Year 2 (Jan. 2 or 3, 1794). This method gave ships a greater tonnage than the methods used in other countries. It was, therefore, far from being advantageous since taxes are based on the tonnage and French vessels were obliged to pay in foreign ports greater dues than foreign ships of the same dimensions.

After repeated reductions, France adopted the system of measurement known in England under the name of the Moorsom method. This method, which has been adopted in a great number of countries, takes into account more exactly the form of the ship but indicates only about four-fifths of the actual capacity of the vessel. The decree of May 24, 1873, has since been modified by the decrees of April 21, 1887, March 7, 1889, and January 31, 1893.

The application of this decree (May 24, 1873) produced a singular result. Under this system, French measurement was less than that of other countries and, in ports where French tonnage was accepted, an advantageous reduction of dues accrued to French shipowners. In most cases, however, the certificate of tonnage was disputed, and this caused French shipowners serious difficulties. To avoid this condition, the method of calculation was modified by the decree of June 22, 1904. This decree adopts the

circular of the Direction des Douanes in Vol. XX of the *Revue-International du Droit Maritime*, p. 143.) The change in the method of calculation increases the net tonnage about 13 per cent. At the same time navigation charges, which are computed on the basis of net tonnage, have been increased by the same amount, and shipowners have said that this little administration requirement costs them 2,000,000 francs a year.

The decree of January 10, 1912, modifies the decree of 1904 in prescribing a reduction for certain spaces which can not be utilized. (Vol. XXVII of the *Revue-International du Droit Maritime*, p. 784.) The purpose of this decree was to make the French method of calculation accord with that followed in England since 1907.

The adoption of an international rule is very desirable. It would save ships, which are not operated on regular lines but which seek freight from port to port, from the necessity of having their tonnage computed in every country they visit. For the payment of tolls for the use of the Suez Canal, the international conference at Constantinople in 1873 adopted uniform rules. It was comparatively easy to secure uniformity on this subject since all of the countries, or nearly all, used the Moorsom method, and it was, therefore, necessary in this conference merely to consider the deductions to be made and the method of calculations.

France is seeking at the present time (1913) to secure reciprocal treatment in the matter of its certificates of tonnage and has made such arrangements with Great Britain, Spain, Italy, and the United States.

JAPAN.

The measurement rules now in force in Japan are contained in the ship measurement law (No. 34) of March 30, 1914, and in the ship measurement regulations contained in notification No. 16 of the Department of Communications which were issued July 17, 1914.

The new rules, which are substantially identical with those now in force in Great Britain, went into operation on October 1, 1914.

The general character of the gross tonnage rules is indicated in the following sections of the ship measurement law:

ART. II. The tonnage deck is the upper deck in ships which have one or two decks, and the second deck from below in ships which have three or more decks.

ART. III. The gross tonnage is the sum of the tonnage below the tonnage deck and the tonnage of the closed-in spaces above the tonnage deck in ships with one or two decks; the sum of the tonnage below the tonnage deck, the tonnage of the spaces between decks, and the tonnage of the closed-in spaces above the upper deck in ships with three or more decks; provided that the tonnage of the following spaces, when situated above the upper deck, shall not be included in the gross tonnage:

1. The spaces used for the working of the helm, the capstan, and the anchor gear; the spaces occupied by the donkey boiler and engine, if not connected with the main machinery.

2. Machinery spaces, wheelhouses, cookhouses, and companion houses.

3. Light and air spaces and water-closets.

4. Any space decreed by the competent Minister of State to be similar to the above-mentioned spaces as regards the safety, sanitation, or the use of the spaces of the ship.

On the request of the owner, the whole or a part of the tonnage of the machinery spaces above the upper deck may be added to the gross tonnage, if the competent Minister of State approves it.

In open ships, the gross tonnage is the sum of the tonnage below the gunwale and the tonnage of the closed-in spaces above the gunwale.

The net tonnage rules of Japan are to be found in Articles IV to VII, inclusive, of the ship measurement law of March 30, 1914, and in articles XXV to XXXVII, inclusive, of the ship measurement regulations of July 17, 1914.

The general character of the net tonnage rules of Japan is indicated in the following extract from the ship measurement law:

ART. IV. In ascertaining the net register tonnage, the tonnage of the following spaces shall be deducted from the gross tonnage, but no deduction shall be allowed in respect to any space which has not been included in the gross tonnage:

4. The spaces used for the working of the helm, the capstan, and the anchor gear; the spaces occupied by the donkey boiler and engine, if connected with the main pumps of the ship.

5. Boatswain's stores.

6. Sail rooms of the sailing ship.

7. Any space deemed by the competent Minister of State to be similar to the above-mentioned spaces as regards the safety, sanitation, or the use of the spaces of the ship.

ART. V. The extent and limit of the spaces prescribed in the preceding two articles shall be determined by the rules which shall be made by the competent Minister of State.

ART. VI. In ascertaining the net register tonnage, the tonnage to be deducted from the gross tonnage as the tonnage of the space occupied by the propelling power, shall be determined by the following proportions:

1. As regards ships propelled by screws, in which the tonnage of the actual machinery spaces is above 13 per cent and under 20 per cent of the gross tonnage, the deduction shall be thirty-two one-hundredths of the gross tonnage; and in ships propelled by paddle wheels, in which the tonnage of the actual machinery spaces is above 20 per cent and under 30 per cent of the gross tonnage, the deduction shall be thirty-seven one-hundredths of the gross tonnage.

2. In cases which do not conform to the preceding section, the deduction shall consist of the tonnage of the actual machinery spaces, with the addition in the case of ships propelled by screws of three-fourths, and in the case of ships propelled by paddle wheels of one-half of the tonnage of the spaces; but on the request of the owner, if the competent Minister of State approves it, the deduction may be estimated in the same manner as prescribed in the preceding section.

The deduction for the machinery spaces shall not in any case exceed 55 per cent of that portion of the tonnage of the ship which remains after deducting from the gross tonnage any deductions allowed in this law except the machinery spaces.

ART. VII. The deduction for the tonnage of the sail rooms shall not in any case exceed 2½ per cent of the gross tonnage.

3. CONSTRUCTION AND EQUIPMENT OF VESSELS.

INTRODUCTORY.

Comparatively little legislation concerning the manner in which vessels shall be constructed has been enacted in any of the selected countries. The absence of legislation is probably due in a large measure to the fact that detailed and efficient rules of classification societies have for many years accomplished the results that would flow from governmental regulation. An examination of the construction rules of Lloyd's Register, the Bureau Veritas, the American Bureau of Shipping, and other classification societies shows them to be most detailed and rigid in their requirements as to materials and methods used in the construction of vessels classified by them.

It might be well here to explain that in order to obtain marine insurance the owner of the vessel must first secure a rating as to the character of construction, condition, age, etc., of the vessel from one of the standard classification societies and that the practice is for the surveyors of this society to inspect the vessel during the process of construction.

A more or less extended account of the work and methods of the several classification societies and of their development is given in Appendix E.

The following brief statement regarding Lloyd's Register, which is the oldest of the classification societies, will be of interest in the present connection:¹

Lloyd's Register, as it exists to-day, is a good illustration of the advantages of co-operative effort. It is interesting to practically every class of the shipping commun-

ity to be able to ascertain the character of a given ship. By the establishment of a responsible committee, representing all these interests, it has been found possible not only to produce a register of shipping which, while giving all the needed details, can be easily kept up to date, but as necessary parts of the same organization there is a system of regulations and survey by means of which the manufacture of the structural and other materials, the work of constructing ships and their upkeep and repair during their careers, have become the duty of Lloyd's Register—the parent of, and in most cases working in association with, similar institutions throughout the world.

The following description of the present system of classification employed for Lloyd's Register is also of interest:¹

As to the present system of classification, it has evolved gradually from that instituted in the year 1834. Then the letter "A" denoted a ship of the first class, which had not passed the prescribed age, and had been kept in a high state of efficiency; that is, a ship capable of undertaking a voyage to any part of the world. The diphthong "AE" denoted a ship in the second rank of the first class. Such a ship had got beyond the prescribed age, and had not been sufficiently overhauled to be restored to the highest class, but remained in a condition capable of carrying with safety dry or perishable cargoes. The letter "E" stood for the second class. Ships in this class, though not fit for conveyance of dry or perishable goods, could trade in any part of the world, and carry cargoes not liable to sea damage. A third class was denoted by the letter "J," and was conferred on ships which were not considered fit to undertake long voyages, nor to carry dry or perishable goods.

The numerals 1 and 2 were added to the letter, and signified the state of the ship's equipment, i. e., anchors, cables, stores, etc. It is unnecessary here to tabulate all the modifications that classification has undergone since 1834. But in the year 1870 it is important to note that the rules for the construction of iron ships were completely redrafted, and the 100 A1 class was instituted. "It is to be distinctly understood that the numerals prefixed to the letter 'A' do not signify terms of years, but are intended for the purpose of comparison only: the A character assigned being for an indefinite period, subject to annual and periodical survey as hereafter described." In the year 1888 rules and regulations for the construction of steel vessels were drawn up, and these had from time to time to be modified. The present rules and regulations of Lloyd's Register were drawn up in the year 1909 and embody regulations to meet every possible contingency.

While the construction rules of the classification societies have done much to secure safe and reliable construction in merchant vessels, it has nevertheless been deemed advisable by the various maritime countries to enact special legislation and to formulate technical rules along these lines. Because of the technical details of these rules and regulations, it is thought best to make in this report reference to the more important regulations only. The subjects considered under this head will be (1) seaworthiness, (2) water-tight compartments, and (3) life-saving equipment.

UNITED STATES.

Seaworthiness.—The statutes of the United States provide in general terms that no vessel may leave any port in the United States in unseaworthy condition. Section 11 of the law of December 21, 1898, imposes penalties upon any person who "knowingly sends or attempts to send or is a party to the sending or attempting to send an American ship to sea, in the foreign or coastwise trade, in such an unseaworthy state that the life of any person is likely to be thereby endangered."

The local steamboat inspectors are required under section 4417 of the Revised Statutes to inspect carefully, at least once a year the hull of every steam vessel within their respective districts, also the hulls of sailing vessels of over 700 tons burden carrying passengers for hire and of all other vessels of over 100 tons burden carrying passengers for hire.

This annual inspection must determine, among other things, whether or not the vessel is suitable for the service in which it is to be employed and is in condition to warrant the belief that it may be used in navigation with safety to life.

Section 4418 of the Revised Statutes contains detailed regulations regarding the inspection of boilers and their appurtenances in all steam vessels before the same shall be used and once at least in every year thereafter. This section provides that all boilers shall be well made of good and suitable material and that all pipes, tubes, flues, etc., shall be of such size, construction, condition, arrangement, and material that they may be safely employed in the service proposed without peril to life.

One provision of section 4418 is the requirement that all boilers used on steam vessels and constructed of iron or steel plates shall be subjected to a hydrostatic test in the ratio of 150 pounds to the square inch to 100 pounds to the square inch of the working steam power allowed. The complaint is made that this test is more severe than it need be and that it frequently causes boilers to leak for a considerable period following the test, but it is interesting to note that Mr. William F. G. Anderson, who was then president of the Chamber of Shipping of the United Kingdom and a managing director of the Anchor Line steamers, in his testimony before the Board of Trade select committee on the application of statutory requirements to foreign ships, made the following statement:¹ "And in America the American Government, instead of testing the boilers to double the working pressure (as is done in Great Britain), only test them to the extent of one-and-a-half times."

Another statutory requirement as to the construction of vessels provides that "every iron or steel plate used in the construction of steamboat boilers * * * shall be inspected in such manner as shall be prescribed by the board of supervising inspectors * * * to ascertain its tensile strength, homogeneousness, toughness, and ability to withstand the effect of repeated heating and cooling." This requirement, which is contained in section 4430 of the Revised Statutes, as amended by section 10 of the act of February 14, 1903, provides that no iron or steel plate shall be used in the construction of such boiler which has not been inspected and approved under these rules.

Water-tight compartments.—The laws of the United States provide that seagoing steamers and those navigating the great northern or northwestern lakes, which carry passengers, and which have been completed since August 28, 1871, shall have not less than three water-tight bulkheads. It is required, also, that the bulkheads must extend to the main deck in single-deck vessels and to the deck next below the main deck in all other vessels, and that they must be built of iron plates supported by a stable framework and properly secured to the hull of the vessel. The law does not specify the position of the bulkheads nor the strength of the material of which they shall be constructed, but provides that these matters shall be determined by the general rules of the board of supervising inspectors.

An exception is made to the above requirements in the case of passenger steamships of 100 tons burden and over, which operate in

the coastwise bays and harbors or upon the Great Lakes, provided they do not operate more than 15 miles from the mouth of such bays or harbors. It is provided, however, that they may be required by the local inspector to provide one water-tight collision bulkhead not less than 5 feet abaft the stem. It will be observed that the British Board of Trade rules make a similar exemption in favor of this class of vessels.

Pursuant to the authority conferred upon them by section 4490 of the Revised Statutes, the board of supervising inspectors has from time to time issued detailed regulations respecting the position of the bulkheads and the materials of which they shall be constructed. The regulations now in force are contained in the August 11, 1915, edition of the General Rules and Regulations Prescribed by the Board of Supervising Inspectors, as amended at the board meeting of January, 1915, and further amended by action of the executive committee at a meeting of August 6, 1915. These rules and regulations are contained in paragraph 23 of Rule III relating to ocean and coastwise vessels and are as follows:

23. Every seagoing steam vessel constructed after July 1, 1912, carrying passengers shall have a water-tight collision bulkhead. In vessels not over 200 feet in length this bulkhead shall be located about one-tenth the vessel's length from stem. In vessels of over 200 and not over 350 feet in length the collision bulkhead shall be located about one-twelfth the vessel's length abaft the stem. In vessels over 350 and not over 500 feet in length it shall be located about one-fifteenth the vessel's length abaft the stem, and in vessels over 500 feet in length, about one-sixteenth the vessel's length abaft the stem. Such vessels shall also have one water-tight bulkhead forward of and one abaft the engine and boilers, and, in addition thereto, shall have such other water-tight bulkheads as may be necessary to provide that there shall be no space between the bulkheads to exceed in length one-fifth the length of the vessel: *Provided, however,* That in no case shall the distance between the bulkheads be greater than 80 feet.

Screw steamers shall, in addition to the above-named bulkheads, have located at a suitable distance forward from sternpost a water-tight bulkhead to protect vessel from disaster in case of fracture of stern pipe.

Sailing vessels over 700 tons carrying passengers for hire shall have a water-tight collision bulkhead. Such collision bulkhead shall be placed not less than 5 feet from the stem of the vessel.

Wooden steamers carrying passengers whose cargo is restricted to lumber exclusively shall only be required to have a water-tight collision bulkhead as described in the first paragraph of this section; also one water-tight bulkhead forward of and one abaft the engines and boilers.

All such bulkheads shall be of iron or steel plates not less than one-fourth inch thick and shall be securely fastened to suitable framework, which framework shall be properly and securely attached to the hull. Such bulkhead shall be strengthened by vertical bars of not less than $3\frac{1}{2}$ by $3\frac{1}{2}$ inch angle iron, spaced not more than 30 inches from center to center, and all steamers that are more than 10 feet deep in any hold shall have horizontal angle irons of not less than 3 by 3 inches on the reverse side, spaced not more than 4 feet from center to center, in addition to vertical angle irons.

Provided, That when any bulkheads are constructed of equal strength to the above-described bulkheads, they shall be allowed by the local inspectors.

All bulkheads shall reach to the main deck in single-decked vessels, otherwise to the deck next below the main deck, but in every case they shall reach to the deck above the deep load line. (Sec. 4490, R. S.)

Life-saving equipment.—The present laws regulating life-saving equipment on vessels under the American flag are found in sections 4481, 4482, and 4488 of the Revised Statutes and in section 14 of the act of March 4, 1915 (popularly known as the seamen's act), which amends section 4488 by embodying practically all of the recommendations as to life-saving equipment made by the International Confer-

This conference, which was held in London from November 12, 1913; to January 20, 1914, was participated in by the representatives of Austria-Hungary, Belgium, Denmark, France, Germany, Great Britain, Italy, Netherlands, Norway, Russia, Spain, Sweden, and the United States. The purpose was to formulate rules regarding safety of life at sea, which would be of universal application. The convention concluded at this conference was signed on January 20, 1914, by the representatives of all the nations parties thereto.

It was agreed that the convention should come into force on July 1, 1915, and should remain in force without any prescribed limit of time. At the same time a provision was also made that the convention should be ratified not later than December 31, 1914, and that each country might denounce the convention at any time after an interval of five years from the date on which the convention should come into force in that country.

Since section 14 of the act of March 4, 1915, contains many technical regulations as to life-saving appliances, it may be well in this report to note only the more striking provisions rather than to attempt a complete statement of this section.

Provision is made for two principal classes of lifeboats, one with sides wholly rigid and the other with sides partially collapsible. Each of these classes is divided into three subclasses as follows:

Class.	Section.	Type.
I. (Entirely rigid sides).....	A. Open.....	Internal buoyancy only.
	B. Open.....	Internal and external buoyancy.
	C. Pontoon...	Well deck; fixed water-tight bulwarks.
II. (Partially collapsible sides).....	A. Open.....	Upper part of sides collapsible.
	B. Pontoon...	Well deck; collapsible water-tight bulwarks.
	C. Pontoon...	Flush deck; collapsible water-tight bulwarks.

The law provides in considerable technical detail how the boats and life rafts shall be constructed. There are numerous provisions also regarding the equipment and capacity of boats and life rafts and the manner in which they shall be stowed on deck. The section also provides in detail for the number and character of davits upon which lifeboats shall be swung and specifies the minimum number of sets of davits, the minimum number of open boats of the first class, and the minimum cubic capacity of these boats for ships classified according to length.

In its requirements as to number of lifeboats and life rafts the law distinguishes between cargo and passenger steamers and between voyages on ocean routes more than 20 miles offshore and ocean routes less than 20 miles offshore, as well as between voyages on ocean routes and those on the Great Lakes.

The requirements as to number of lifeboats and life rafts may be summarized as follows:

- (A) Lifeboats for all persons (crew and passengers) on board:
 - (1) All cargo steamships operating on ocean routes or on the Great Lakes; at all seasons.
- (B) Lifeboats and pontoon life rafts for all persons on board:

- (B) Lifeboats and pontoon life rafts for all persons on board—Continued.
- (2) All passenger steamships operating on ocean routes less than 20 nautical miles offshore; only from September 15 to May 15.
 - (3) All passenger steamships operating on the Great Lakes on routes more than 3 miles offshore, except over waters whose depth is not sufficient to submerge all the decks of the vessel; only from September 15 to May 15.
- (C) Lifeboats and pontoon life rafts for not less than 70 per cent of all persons on board:
- (1) All passenger steamships operating on ocean routes less than 20 nautical miles offshore; only from May 15 to September 15.
- (D) Lifeboats and pontoon life rafts for at least 50 per cent of all persons on board:
- (1) All passenger steamships operating on the Great Lakes on routes more than 3 miles offshore, except over waters whose depth is not sufficient to submerge all the decks of the vessel; from May 15 to September 15.
- (E) Number, type, and capacity of lifeboats and life rafts, together with the proportion of such accommodation to the number of persons on board, to be determined by regulations of the Board of Supervising Inspectors, approved by the Secretary of Commerce, in case of:
- (1) Steamships operating on the Great Lakes on routes 3 miles or less offshore or over waters whose depth is not sufficient to submerge all the decks of the vessel.
 - (2) Steamships operating on "all other lakes."
 - (3) Steamships operating on rivers, bays, and sounds.

In the case of passenger steamships operating on ocean routes more than 20 miles offshore: The law provides that if the minimum number of lifeboats attached to davits, required under the general provisions of this section, does not afford sufficient accommodation for all persons on board, additional life-boats must be provided to accommodate at least 75 per cent of all persons, and the remainder of the accommodation must be either in boats of Class I or Class II, or in pontoon rafts of an approved type.

In the case of passenger steamships operating on ocean routes less than 20 miles offshore: The requirement is that lifeboats for at least 75 per cent of all persons on board shall be provided in the season from September 15 to May 15 and that during the remaining months, when lifeboats or pontoon life rafts for only 70 per cent of all persons are required, the capacity of the lifeboats shall be sufficient to accommodate at least 50 per cent of this quota.

In the case of passenger steamships operating on the Great Lakes, on routes more than 3 miles offshore: The requirement is that lifeboats for at least 75 per cent of all persons on board shall be provided in the season from September 15 to May 15, when passenger travel is greatly reduced and life-saving equipment for all is required. During the season from May 15 to September 15, when lifeboats and life rafts for not more than 50 per cent of all persons are required, the capacity of the lifeboats shall be sufficient to accommodate at least 40 per cent of this quota.

These provisions apply to all boats built prior to July 1, 1915. Vessels whose keels have been laid since that date, whether for service on ocean routes or for service from September 15 to May 15 on the Great Lakes on routes more than 3 miles offshore, shall be built to carry, and shall carry, sufficient lifeboats and life rafts for all persons, the number of lifeboats being sufficient to accommodate at least 75 per cent.

It will be observed that the number of lifeboats and life rafts on passenger steamships depends, in the first instance, upon the number of persons on board. The maximum number of passengers a vessel

Inspection Service, section 4464 of the Revised Statutes providing that "the inspectors shall state in every certificate of inspection granted to steamers carrying passengers, other than ferryboats, the number of passengers of each class that any such steamer has accommodations for, and can carry with prudence and safety."

The minimum number of the crew is also determined by the steamboat inspectors. (Sec. 4463 of the Revised Statutes as amended by act of Apr. 2, 1908, sec. 1 of act of Mar. 3, 1913, and sec. 14 of the act of Mar. 4, 1915.)

A requirement of section 14 of the act of March 4, 1915, which is new to the statutes of the United States, is that lifeboats and life rafts shall be manned according to definite fixed conditions, as follows:

First. Every lifeboat and every pontoon life raft carrying more than 15 persons (and not more than one-half of the rafts may carry more than 15) must be under the charge of a licensed officer or an able seaman. It is the duty of such officer or seaman to have a list of the certificated lifeboat and other men who have been assigned to his boat and to see that these men are acquainted with their several duties and stations.

Second. Every lifeboat and every pontoon life raft shall have a specified number of certificated lifeboat men, the number varying with the capacity of the life boat or raft, as follows:

Capacity of boat or raft.	Minimum number of certificated lifeboat men.
25 persons or less.....	1
26 to 40 persons.....	2
41 to 60 persons.....	3
61 to 85 persons.....	4
86 to 110 persons.....	5
111 to 160 persons.....	6
161 to 210 persons.....	7

The term "certificated lifeboat man" is new to the laws of the United States and also to those of foreign countries. Section 14 defines a certificated lifeboat man as "any member of the crew" holding a certificate of efficiency issued under the authority of the Secretary of Commerce. To obtain this certificate the seaman must prove: (1) That he has been trained in all the operations connected with launching lifeboats; (2) that he is acquainted with the practical handling of the boats themselves; and (3) that he is capable of understanding and answering the orders relative to lifeboat service.

The opening paragraph of section 14 of the act of March 4, 1915, contains this proviso: "Provided, That foreign vessels leaving ports of the United States shall comply with the rules herein prescribed as to life-saving appliances, their equipment, and the manning of same."

The question having been raised as to whether, in view of section 4400 of the Revised Statutes (which exempts from inspection by officials of the United States all foreign passenger steamers belonging to countries that have inspection laws approximating those of the United States), foreign steamships did, in fact, come within the scope of section 14, the Solicitor of the Department of Commerce and later

Apparently, these rulings exempt all foreign passenger steamships from the provisions of section 14. On the other hand, the point can well be made that the inspection laws of any foreign country whose requirements as to life-saving equipment fall much below the requirements of section 14, can not be regarded as approximating inspection laws of the United States.

Another fact worth noting is that all of the more important maritime countries¹ except Japan, whose representatives at the conference had no power from their Government to vote, agreed, through their duly accredited representatives, to adopt the London Convention on Safety of Life at Sea, on which section 14 is plainly modeled, and to apply its provisions as to life-saving appliances "to existing vessels as soon as possible, and not later than the 1st of July, 1915."²

It is not definitely known how many of these Governments have formally ratified the London convention and enacted legislation to comply therewith. It is known, however, that Great Britain, which already had strict requirements as to life-saving equipment, made them even more strict³ to comply with the London convention, and that the new French liner *Lafayette* is advertised as having life-saving equipment that complies in all respects with the requirements of this convention.

Had the European war not intervened, it is reasonable to believe that all of the countries party to the London conference would have enacted the required legislation, and it is not unreasonable to believe that this will be done as soon as the war is concluded. At this point the following extract from the Annual Report of the Commissioner of Navigation for 1914 (p. 28) is of interest:

The international convention is the most important step ever taken by maritime nations to promote the safety of life at sea, and it is to be trusted that the Senate will consent to its ratification before December 31, 1914, when ratifications, by the terms of the convention, were to be deposited at London. The convention was ratified by the German Reichstag in May, and the British Parliament passed on August 10 the bill to give effect to the convention. Before the outbreak of the European war in August the preliminary steps for ratification had been taken in France, Spain, the Netherlands, Belgium, Italy, Austria, and Hungary, and at that time ratification was expected in the early autumn. The Parliaments of Denmark and Sweden do not assemble until early in 1915, so those powers can not ratify until that date. The war will undoubtedly delay until beyond July 1, 1915, the time when the convention shall go into effect, but legislation by Congress will be necessary after the convention shall have been ratified.

GREAT BRITAIN.

Seaworthiness.—Section 457 of the merchant shipping act of 1894 is similar in its effect to the United States statute on the subject of seaworthiness.

The British law, however, appears to be more stringent in the power given the administrative authorities to detain unsafe British ships. Section 459 of the merchant shipping act of 1894 provides that "The Board of Trade, if they have reason to believe, on complaint or otherwise, that a British ship is unsafe, may order the ship

¹ Austria-Hungary, Belgium, Denmark, France, Germany, Great Britain, Netherlands, Norway, Russia, Spain, Sweden, and the United States.

to be provisionally detained as an unsafe ship for the purpose of being surveyed," whereas the corresponding American statute, which is found in section 4556 of the Revised Statutes, as amended by section 7 of the law of December 21, 1898, provides that investigations as to the unsafe condition of American ships in domestic ports shall be instituted only upon complaint by the first and second officers or a majority of the crew.

It will be noted that under the British statute the manner of making the complaint is not restricted as in the American law.

As to unseaworthy foreign ships that have taken on board all or any part of their cargo at a port in the United Kingdom, section 462 of the merchant shipping act of 1894 provides that they may be detained in the same manner as unsafe British ships, except that proper notice of the detention must be duly communicated to the nearest consular officer of the country to which the ship belongs.

Sections 459 and 462 of the act of 1894 were extended by the act of August 6, 1897, which provides that undermanning shall be regarded as contributing to unseaworthiness of a vessel and therefore as cause for detention.

The merchant shipping act of 1906, part 1, section 2, also strengthened the force of section 462 of the act of 1894 by making this provision apply to foreign ships as well as to British vessels whether they take on cargo or not and by making it apply to ships that are unsafe because of defective condition of hull, equipment, or machinery.

The later act, it should be noted, is a result of the investigation of the select committee on the application of statutory requirements to foreign ships. At the hearings of this committee, which were held in 1904, a number of British shipowners complained that heavier burdens were placed by British laws upon British shipping than upon foreign shipping. For example, one shipowner testified as follows:¹

In my experience a great many sailing vessels have when British-owned been stopped as unseaworthy, for both expensive and extensive repairs to hull, spars, and gear which have had to be carried out, whereas foreign vessels inferior in many respects have been allowed to sail from British ports unchallenged, thereby allowing the foreign owner with a much less capital outlay and a much less revenue expenditure to compete with British ships.

Water-tight compartments.—The merchant shipping acts of Great Britain contain no provision as to the number, location, and character of construction of water-tight bulkheads. The Board of Trade, however, has issued instructions on this subject, which are contained in sections 50, 51, and 52 of its instructions as to the survey of passenger steamships.² These regulations, it will be noted, apply only to steamships carrying passengers, there being none with respect to vessels which do not carry passengers. The rules regarding the subdivision of passenger steamers are as follows:

50. *Collision bulkheads, water-tight compartment round stern tube, and other bulkheads.*—An efficient and water-tight engine-room and stokehold bulkhead, as well as a collision water-tight bulkhead, and an after water-tight compartment to inclose the stern tube of each screw shaft, should be fitted in all seagoing steamers, both old and new, and in the absence of any of these the case must be specially referred to the Board of Trade before a declaration is given. As regards other bulkheads, a complete

subdivision of the ship is of great importance. The surveyors can not at present require any particular arrangement of bulkheads to be adopted, but in the event of an arrangement being proposed which would, in the surveyor's opinion, render the vessel insufficient for the intended service, having regard to the number of persons carried, full particulars should be submitted to the Board for instructions before a declaration is issued.

The distance of the collision bulkhead from the after side of the stem measured at the level of the lower deck should not be less at any part than one-twentieth of the vessel's length measured from the after part of the stem to the fore part of the stern-post, on the range of the upper deck beams, in one, two, and three decked and spar-decked vessels, but on the range of the main-deck beams in awning-decked vessels.

The collision bulkhead should not have any opening in it, nor should it be fitted with any valves or cocks for draining the compartment in front of it. Pipes should not be carried through it without the special permission of the Board of Trade.

In all seagoing steamers coming under survey for passenger certificate for the first time the following requirements regarding the height of the bulkheads should be complied with.

The collision bulkhead is in all cases to extend to the upper deck. If an iron or steel water-tight deck or flat is fitted below the upper deck at the after end of the vessel and forms the top of the after water-tight compartment, the aftermost bulkhead may terminate at the said water-tight deck or flat, but if no such water-tight deck or flat is fitted, the aftermost bulkhead should extend to the upper deck.

When the load-line disk of the vessel is placed at least as low as is required by Table C of the Freeboard Tables for awning-deck vessels, the remaining bulkheads may terminate at the deck next below the upper deck, but when the disk of vessels other than those of the awning-deck type is placed higher than required by Table C all the bulkheads should extend water-tight to the upper deck. In interpreting the above rule, in the case of vessels of the shelter-deck type, the deck next below the shelter-deck may be regarded as the upper deck, and accordingly the collision bulkhead, as well as the other bulkheads, may terminate at the deck next below the shelter deck, provided the surveyor is satisfied that the deck in question would not, owing to a deficiency of sheer or for any other reason, be brought dangerously near the water surface in the event of the collision compartment being holed. When, however, the surveyor is in any doubt as to the vessel being able to steam at sea with the collision compartment holed, full particulars should be submitted to the Board of Trade before a declaration is issued.

The above regulations regarding the height of the bulkheads and the position of the collision bulkhead are intended to apply only to passenger steamships coming under survey hereafter for the first time.

In the case of vessels plying within smooth water or partially smooth water limits, while it is desirable that the above requirements as to seagoing steamers should be complied with, the arrangement of bulkheads may be modified to meet the case of vessels of small size, or carrying only a small number of passengers. In all new iron or steel passenger steamers, however, with the exception stated below, an efficient collision bulkhead at least should be provided, and declarations should not be issued for vessels not so fitted without special instructions from the Board of Trade.

Steam launches intended exclusively for plying on very narrow waters will not be required to comply with the above regulation, but the intended limits should be notified for the Board's approval at an early stage of construction.

51. Screw tunnels and alternative arrangements.—In all seagoing screw passenger vessels there should be fitted in front of each stern-tube stuffing-box bulkhead either a complete water-tight tunnel extending from the stuffing-box bulkhead to the after engine-room bulkhead, or a water-tight compartment immediately before the stuffing-box bulkhead, and extending forward of this not less than twelve times the diameter of the propeller shaft. In either case the tunnel or water-tight compartment should be substantially constructed with a stuffing box around the shaft at the bounding bulkhead through which it passes. The tunnel or compartment should be capable of confining the water which might enter the vessel in the event of any part of the aftermost stuffing-box bulkhead or its fittings giving way. The height and width of the water-tight tunnel or compartment should be amply sufficient at every part to permit all work which may become necessary to the shaft couplings, bearings, etc., to be performed.

If there is an opening through the engine-room bulkhead, or the bulkhead forming the forward boundary of the water-tight compartment a properly constructed water-tight door, capable of being expeditiously opened and closed from a point well above the deck load line, preferably the upper deck, should be fitted to it. If no such

and perfectly secure water-tight trunkway, extending to the upper deck, so that the interior of the water-tight tunnel or compartment may be at all times accessible.

The water-tight tunnels, compartments, and trunkways are in all cases of iron or steel vessels to be constructed of wrought iron or steel.

If there are manholes or openings in the floor of the tunnel care should be taken that all are sufficiently fitted with covers or doors so arranged that they can easily and rapidly be made water-tight. Cocks or valves and pipes should be fitted to let the water off the floor of the tunnel or compartment, and should be made to open or shut from a point well above the deep load line.

Declarations may be granted for vessels requiring only partially smooth and smooth water certificates without water-tight tunnels.

52. *Water-tight doors in bulkheads.*—When inspecting steamships, for which passenger certificates are required, the surveyors should be careful to examine the water-tight doors, especially those in the stokehold bulkheads and coal bunkers. The surveyors are not expected to insist on any particular description of door being fitted, nor to raise objections so long as they are satisfied that the arrangements provided are such as comply with the usual requirements for the service intended, at the same time suitably placed vertical doors, which can be opened and closed efficiently and expeditiously, would seem to be those on which most reliance can be placed, more particularly for closing the communication with coal bunkers.

It is desirable that the closing edges of doors should be beveled.

All doors on bulkheads required by the regulations to be water-tight should be capable of being worked from a point well above the deep-load line, preferably the upper deck.

If the surveyor is of opinion that there is danger of persons being injured while passing through a doorway in a bulkhead, owing to the door being of a quick-closing type, or for any other reason, a report of all the circumstances should be forwarded to the Board before a declaration is issued.

It will be noted that the above rules, which were issued in 1913, are retroactive in their operation and that they apply to "all sea-going steamers both old and new."

Section 50 provides for three bulkheads, one for the engine room and stokehold, a collision bulkhead, and one to inclose the stern tube of each screw ship. Bulkheads must be "efficient" and "water-tight." With respect to additional bulkheads, this section merely states that "a complete subdivision of the ship is of great importance." As to arrangement of bulkheads, section 50 provides that surveyors can not "at present" require any particular arrangement, but they shall report to the Board of Trade any proposed arrangement of bulkheads that would in their opinion be insufficient.

The rules provide in detail for the location and height of the collision bulkhead, but these, it will be noted, are intended to apply only to passenger steamships coming under survey for the first time.

Another point that should be specially noted is that the requirements are less strict with regard to vessels "plying within smooth water or partially smooth water limits." Apparently, at the option of the Board of Trade, such vessels need not have more than an efficient collision bulkhead, and, if they have more than one bulkhead, the arrangement of the same may be modified to meet the requirements of vessels of small size or those that carry only a small number of passengers.

Water-tight bulkheads have for nearly 30 years been the subject of thorough investigation by various special parliamentary commissions. As early as 1887 a select committee appointed to inquire into the existing laws and regulations regarding boats and their life-saving appliances on British merchant ships reported that "the proper placing of bulkheads so as to enable a ship to keep afloat

important for saving life at sea and a thing upon which the full efficiency of life-saving appliances largely depends."¹

A committee appointed to advise the Board of Trade in the making of rules as to life-saving equipment required under the life-saving appliances act of 1888, recommended that the number of boats and life rafts required in "foreign-going passenger and emigrant steamers which were divided into efficient water-tight compartments so that, with any two of the compartments in free communication with the sea, the ship would remain afloat in moderate weather, * * * need be only one-half the capacity of those required on ships not so subdivided."¹

In 1890 a committee on spacing and construction of water-tight bulkheads was appointed. This committee made an exhaustive study of the subject, and its report has been the basis of practically all of the subsequent regulations on bulkheads. This report was adopted by the Board of Trade also for the purpose of the rules for life-saving appliances then in force, and the concession allowed by these rules to the efficiently subdivided vessels could be obtained only by compliance with the recommendations of the report. The number of applications for this concession was small, but the report exercised a beneficial influence on subdivision generally.¹

This subject of bulkheads was made a matter of investigation also in 1912, when a departmental committee on bulkheads and water-tight compartments was appointed by the Board of Trade to advise: (1) As to what, in their opinion, would constitute efficient subdivision with regard to each of the classes of vessels included in the rules for life-saving appliances made by the Board of Trade under section 427 of the merchant shipping act of 1894, having due regard to the nature of the service in which they are respectively engaged; (2) whether independently of the foregoing the committee desire to make any recommendation, with respect to the subdivision of vessels already built, or of new vessels, which would, in their opinion, contribute to the safety of life at sea.

This committee made an exhaustive investigation of the subject, employing a competent technical staff, and making numerous practical demonstrations and tests of various ideas. The report of this committee is technical, as might be expected from the nature of the subject. An excellent summary of its findings is to be found in Appendix 3 of volume 1 of the first report of the committee, made in 1914.

The results of these investigations were submitted to the International Conference on Safety of Life at Sea, which met in London from November 12, 1913, to January 20, 1914. The system proposed by the committee was considered by the conference along with the German system and the proposed French system. It appears that the system adopted in this conference and made a part of the international convention is a mixture of the German system, the proposed French system, and the proposed British system. It might be added that the final determination as to subdivision embodied many of the ideas submitted by the American delegation, one of whose number was chairman of the conference committee on subdivision.

LAWS AFFECTING THE VESSEL.

The report of the Board of Trade committee on bulk water-tight compartments states that "the idea of fixed bilities, in accordance with the British system, and with the the German practice of using a fixed margin line, and with the system of the French; whilst the adoption of ship expression decreasing in value with the increase in length of ship. The factors were based on idea common to all three systems of obtaining gradually increased safety with increasing length of ship. The factors were based on practical experience of these three nations, though the values were modified finally by the independent investigations and criticism the other powers."

Life-saving equipment.—A new set of rules regarding life-saving equipment on British ships was issued by the Board of Trade on May 8, 1914, and was to have come into operation on July 1, 1914, but this date has been deferred to July 1, 1916. These rules will change in a few particulars the provisions of the International Conference on Safety of Life at Sea. Since these rules conform generally to the recommendations of the London conference, they are very similar to those contained in section 14 of the act of March 4, 1915, of the United States, and it will not be necessary, therefore, to make a detailed summary of the rules.

One of the most interesting features of the Board of Trade rules is the detailed classification of ships; next, between steamships and sailing ships; next, between ships carrying passengers and those that do not; and finally, within the home-trade group, between steamers operating in smooth water, partially smooth water, on short specified voyages along the coast, and on short daylight excursions to sea.

The following is a revised grouping of the classifications noted in the proposed rules, which are very similar to the classifications of the rules now in force, the purpose of this regrouping being to indicate in a more striking way the main distinctions made between the several groups of ships:

A. Steamships—

- (1) Carrying passengers (class 1).
 - (2) Not carrying passengers (class 2).
- ### B. Sailing ships—
- (1) Carrying more than 12 passengers (class 3).
 - (2) Not carrying more than 12 passengers (class 4).

C. Home-trade ships—

- (a) Anywhere within home-trade limits (class 1).
- (b) On short specified passages along the coasts of the United Kingdom or between Great Britain and the Isle of Man (class 5).
- (c) On short excursions to sea, i. e., beyond the partially smooth water limits, between April 1 and October 31, during daylight and in fine weather (class 6).

Board of Trade Committee on Subdivision of Merchant Ships.

2. Home-trade ships—Continued.

A. Steamships—Continued.

(1) Carrying passengers—Continued.

(d) In partially smooth water (class 7).

(e) In smooth water in estuaries and lakes (class 8).

(f) In smooth water on rivers and canals (class 9).

(g) On steam launches (also motor boats) for short distances at sea (class 10).

(2) Not carrying passengers but operating within home-trade limits (class 2).

(3) Steam fish carriers, tugs, steam lighters, dredges, steam hoppers, hulks, and barges.

(a) Which proceed to sea (class 11).

(b) Which do not proceed to sea (class 11).

B. Sailing ships—

(1) Carrying passengers anywhere within home-trade limits (class 3).

(2) Not carrying passengers but operating within home-trade limits (class 4).

With regard to the types, size, character of construction, material, external buoyancy, minimum freeboard, equipment and stowage of lifeboats and pontoon life rafts, and the number of davits, etc., the proposed Board of Trade rules like the corresponding provisions of section 14 of the act of March 4, 1915, of the United States, are practically a verbatim reproduction of Articles XXVII to XLVI of the London Convention on Safety of Life at Sea.

In one important respect, however, the proposed Board of Trade rules fall short of the standards set by the London convention, since they do not require lifeboats and life rafts to be under the charge of licensed officers or able seamen and manned by members of the crew who hold certificates as skilled lifeboat men.

Nevertheless, a merchant shipping advisory committee appointed by the Board of Trade to investigate "the statutory regulations as to the boats and life-saving appliances and other means of insuring safety of life at sea," in its report filed in 1912, made the following statement:¹

The question of the manning of boats has been very carefully considered, and the following alternative resolutions were proposed:

1. That no passenger vessel trading outside of home-trade limits should be considered efficiently manned unless it carries at least three efficient boat hands (of whom two shall be able seamen) for each boat carried.

2. That the effective manning of all the boats carried on passenger and emigrant vessels can be only secured by the training and organizing of the crew as a whole. If the crew as a whole be so trained and organized, the boats can be effectively manned if there are two efficient boat hands carried for each of the boats carried under the davits or immediately available for attachment to the davits. Facilities should be given to enable all hands to prove their competency as efficient boat hands.

On a division the second resolution was approved by a majority, a minority of the members of the committee being in favor of the first resolution.

Special consideration has been given to the case of vessels employing lascars, and, in connection with this question, we have had before us the recommendations as to the manning of boats made by the court of inquiry into the loss of the *Oceana*. The following alternative resolutions were proposed:

1. That lascars, if efficient boat hands, may be accepted as equal to white boat hands, but it is necessary that there be provided for each boat, in addition to two efficient lascar boat hands, one officer or one petty officer able to communicate orders to the lascars.

2. No passenger vessel carrying lascars shall be deemed efficiently manned unless it carries two efficient white boat hands for each boat.

The first resolution was adopted by a majority of the committee.

¹ Report of Merchant Shipping Advisory Committee on Statutory Regulations as to Boats and Life-saving Appliances (1912), p. 14.

This committee was composed chiefly of prominent shipowners and made an exhaustive investigation of statistics on casualties at sea and the causes of wrecks, as determined by courts of inquiry, as well as of other technical matters. In an examination of the question as to "how far the existing (1912) rules provide boat accommodation for all persons on board," the committee found the following conditions:¹

The great majority, if not all, the 2,160 vessels under 50 tons and all the 6,450 cargo vessels engaged in the home and foreign trades carry boat accommodation sufficient for all on board, and, in the case of steamships, such boat accommodation must be carried on each side of the vessel. The 4,191 fishing vessels, so far as they are capable of carrying boats, also provide for all on board.

The question of the sufficiency of the boat accommodation therefore arises principally, if not entirely, in relation to the 1,587 steamships holding passenger certificates. Of these vessels, 417 are employed in smooth or partially smooth water only.

With the view of ascertaining how far, under the existing life-saving appliances rules, foreign-going passenger steamers do, in fact, carry a sufficient number of boats under davits to provide for all persons certified for in the passenger certificate, a return has been obtained giving particulars as to boats carried under davits on all foreign-going passenger steamers holding certificates on 25th April, 1912.

This return shows that the boat scale contained in the table appended to the life-saving appliances rules was sufficient to provide for all persons in the case of 343 out of the 521 vessels in the list.

The Board of Trade rules now in operation provide in general that steamers licensed to carry passengers in the foreign trade or anywhere within the home-trade limits, including in most cases those operating on short specified passages along the coasts of the United Kingdom, etc., must carry a minimum number of davits and a minimum number of open lifeboats of class 1 that have a specified minimum cubic capacity according to the registered length of the vessel.²

The provisions of the proposed Board of Trade rules regarding minimum number of davits and of lifeboats, etc., with specified lengths of ships, are identical with the corresponding provisions of Article XLIII of the London convention and of section 14 of the act of March 4, 1915, of the United States.

The fundamental principle of these rules may be said to be that at no moment of its voyage may a vessel have on board a total number of persons greater than that for whom accommodation is provided in the lifeboats and the pontoon life rafts on board. Nevertheless there is more or less variation in the requirements for each of the 16 groups of vessels affected by the rules, as might be expected from the detailed character of these groupings.

General rule No. 16 of the present rules and General Rule No. 20 of the proposed rules provide that the Board of Trade may in certain specified instances direct that one or more sets of davits may be dispensed with upon such conditions as may be deemed best, if the board considers it impracticable or unreasonable to require the number of davits, lifeboats, rafts, etc., stipulated in the rules.

GERMANY.

Seaworthiness.—The principal requirements as to seaworthiness of German vessels are to be found in the accident-prevention rules of the See-Berufsgenossenschaft for steamers and for sailing vessels. Section

¹ Report of Merchant Shipping Advisory Committee on Statutory Regulations as to Boats and Life-
² See also (1912) p. 53.

1 of article 1 in each set of rules provides as follows: "Every ship must be in seaworthy condition and properly fitted out and equipped, manned, and provisioned, when it leaves port. The necessary papers regarding the ship, its character and cargo, must be on board the vessel. All equipment for loading and unloading must be in fit condition for use and the loading must be properly performed in an orderly manner according to the usages of the trade. The ships must not be overloaded. Ships without cargo or with insufficient cargo must be provided with the necessary ballast."

These rules also contain numerous provisions with regard to material, manner of construction, arrangement, etc., of anchors, chains, masts, tackles, character and arrangement of cargo, etc.

Many of these regulations correspond closely to those formulated by the Board of Supervising Inspectors of the United States, but on the whole they appear to be more detailed and exacting. It should be particularly noted, however, that the German rules have been formulated by the shipowners who are the parties most interested in their enforcement.

In referring to the German regulations as to seaworthiness, Sir William Ward, British consul general at Hamburg, testified before a parliamentary commission in 1904 as follows:¹

There is in the German seamen's law a similar clause as in our own merchant shipping law, that a certain number of the crew have a right to complain and bring before a magistrate the question as to whether or not the ship is unseaworthy, but the law which affects both foreign and German ships (this includes British) is really a local law—that is, a police law—which gives the police the right, under certain paragraphs of the general administrative legislation, to issue an order stopping any ship which has been proved to them to be unseaworthy, they themselves having the point to decide whether she is unseaworthy or not. It is, then, the only law which, similar to ours, gives the authorities the right to stop an unseaworthy vessel.

Water-tight compartments.—Section 4 of the rules for steamships makes the following requirements respecting water-tight compartments:

All steamships the keel of which shall be laid after January 1, 1910, shall be equipped with water-tight compartments, as follows:

(1) A water-tight compartment known as collision bulkhead extending from the keel to the highest deck running the length of the vessel. The collision bulkhead must be so placed that its distance from the stem at the load line shall measure not less than one-twentieth of the length of the ship between posts. No openings are permitted in this bulkhead above the double bottom.

(2) A water-tight bulkhead at each end of the engine room and stokehold. This must extend to the main deck, or, if the main deck lies below the load line, to the next higher deck.

(3) In the case of screw steamers, a water-tight bulkhead known as the stuffing-box bulkhead, which is to be placed in the afterpeak and shall extend up to the main deck or to a platform located above the load water-line and firmly attached to the outer hull.

Section 5 provides that passenger steamers engaged in Atlantic or long voyages must comply with the rules concerning water-tight compartments for passenger steamers in non-European voyages laid down in supplement 1 issued in 1907. These rules also apply to all passenger steamers engaged on long coasting trips if their length exceeds 90 meters (295 feet) and if built prior to January 1, 1910.

If there are doors or other openings for bringing in cargo below the deep water line, they are to be closed before the departure of the ship and to be kept closed throughout the voyage. A notation is to be made in the log as to whether or not these doors were closed before the departure of the ship. If there is a water-tight door in the compartment between the boiler room and the cargo hold, the same is to be closed as far as possible in foggy weather.

The rules regarding water-tight compartments for sailing vessels other than those engaged in small coasting trips provide that there shall be water-tight compartments on all small sailing vessels the keels of which are laid after January 1, 1910. These rules provide for only one water-tight compartment, a collision bulkhead, which is to be placed at a sufficient distance back from the bow and to extend up to the highest deck running the entire length of the ship. This bulkhead, moreover, is to be so placed that its distance from the bow measured along the load line shall be not less than one-twentieth of the length of the ship between the posts. No openings are to be permitted in the bulkhead above the double bottom of the hull.

This section also provides that barges or other boats which are ordinarily towed must have a bulkhead in the stern in addition to the collision bulkhead.

The minimum number of bulkheads required under the rules of the See-Berufsgenossenschaft, it will be observed, is the same as that required in the British Board of Trade rules and in the Revised Statutes of the United States. It will be observed further that these rules cover only the minimum requirements. The detailed requirements of the German rules are not at hand, but it is understood that they vary in general with the size of the ship and are quite as drastic as our own. On this point also, it may be well to quote the testimony of Sir William Ward, who said that "the erection of a very large number of bulkheads is required by these rules, and the German opinion is that the number is greater than required of our (British) passenger ships. I am not in a position to say entirely how many that is, but I am assured by a number of German technical men that it is so."¹

Life-saving equipment.—The maritime laws of Germany contain no reference to life-saving equipment on vessels under the German flag other than emigrant ships. It appears that the only other rules on the subject are those formulated by the See-Berufsgenossenschaft and issued as a supplement to the accident-prevention rules of the association.² These rules, it might here be noted, are very similar to those relating to emigrant ships which are contained in sections 35 to 52 of an imperial decree of March 14, 1898, interpreting the emigration act of June 9, 1897.

The See-Berufsgenossenschaft is a cooperative association of ship-owners, which is required under the imperial insurance laws of Germany for the purpose of insuring its members against accident. As Sir William Ward, who was then British consul general at Hamburg, testified in 1904 before a British parliamentary commission, the life-saving rules formulated by this association have been issued to "guard their own interests, in order to prevent the

¹ Report of Committee on Application of Statutory Requirements to Foreign Ships, 1904, p. 67.

² Anlage V, betreffend Boote und Rettungsgeräte, zu den Unfallverhütungsvorschriften der See-Berufsgenossenschaft für Dampfer (1909 edition). Also Anlage IV zu Vorschriften für Seeschiffe (1909 edition).

number of accidents in paying for pensions and injuries received; so that they have done everything possible as regards the equipment and fitting out of vessels, both steamers and sailing ships, as would be done by any commercial undertaking, to guard their own interests; and these laws have been afterward sanctioned by the German Government."¹

The life-saving regulations of the *See-Berufsgenossenschaft* are contained in supplements to the two principal sets of rules for accident prevention, one relating only to steamers and the other to sailing vessels engaged in other than short coasting trips. The supplements are designated, respectively, as Supplement V and Supplement IV, and both were issued in 1909.

The rules regarding life-saving equipment for steamships distinguish five classes of vessels as follows: (1) Steamers making Atlantic or long voyages, (a) with more than 10 passengers on board, (b) with no passengers or less than 10; (2) steamers making long coasting trips, (a) with more than 10 passengers on board, (b) with no passengers or less than 10; and (3) steamers making short coasting trips and those operating in bays and sounds.

Steamers making Atlantic or long voyages and carrying more than 10 passengers must be provided with a specified minimum number of lifeboats having a specified minimum capacity that varies with the gross capacity of the vessel, as shown in the following table:

Gross register tonnage.	Minimum number of boats.	Total minimum capacity of boats.	Gross register tonnage.	Minimum number of boats.	Total minimum capacity of boats.
		<i>Cubic feet.</i>			<i>Cubic feet.</i>
Less than 88.....	2	212	5,477 to 5,724.....	8	3,567
88 to 177.....	2	247	5,724 to 5,972.....	8	3,673
177 to 283.....	2	300	5,972 to 6,219.....	10	3,920
283 to 389.....	2	318	6,219 to 6,456.....	10	4,026
389 to 495.....	2	389	6,456 to 6,714.....	10	4,132
495 to 601.....	3	600	6,714 to 6,961.....	10	4,238
601 to 707.....	3	742	6,961 to 7,209.....	10	4,344
707 to 813.....	4	812	7,209 to 7,456.....	10	4,450
813 to 919.....	4	918	7,456 to 7,703.....	10	4,556
919 to 1,025.....	4	1,024	7,703 to 7,950.....	10	4,661
1,025 to 1,272.....	4	1,236	7,950 to 8,481.....	12	4,944
1,272 to 1,519.....	4	1,483	8,481 to 9,011.....	12	5,085
1,519 to 1,768.....	4	1,624	9,011 to 9,541.....	12	5,227
1,768 to 2,014.....	4	1,730	9,541 to 10,071.....	14	5,36
2,014 to 2,262.....	4	1,836	10,071 to 10,601.....	14	5,509
2,262 to 2,509.....	4	1,942	10,601 to 11,131.....	14	5,650
2,509 to 2,756.....	4	2,048	11,131 to 11,661.....	14	5,792
2,756 to 3,004.....	4	2,154	11,661 to 12,191.....	14	5,933
3,004 to 3,251.....	6	2,366	12,191 to 12,721.....	14	6,074
3,251 to 3,498.....	6	2,472	12,721 to 13,251.....	14	6,357
3,498 to 3,746.....	6	2,578	13,251 to 13,781.....	14	6,639
3,746 to 3,993.....	6	2,684	13,781 to 14,311.....	14	6,922
3,993 to 4,240.....	6	2,790	14,311 to 14,841.....	14	7,204
4,240 to 4,488.....	6	2,896	14,841 to 15,371.....	14	7,487
4,488 to 4,735.....	6	3,002	15,371 to 15,901.....	14	7,769
4,735 to 4,982.....	8	3,249	15,901 to 16,431.....	16	8,052
4,982 to 5,230.....	8	3,355	16,431 to 16,961.....	16	8,334
5,230 to 5,477.....	8	3,461	16,961 to 17,668.....	16	8,617

The rules provide that a smaller number of boats than specified in the above table may be permitted if the total boat capacity is equivalent to 0.285 cubic meter (10.1 cubic feet) for every adult person on board.

¹ Report of Committee on Application of Statutory Requirements to Foreign Ships, 1904, p. 68.

In regard to the number of davits, it is provided that, within the limits prescribed in the above table, there must be as many davits as the construction of the ship will permit. If, however, the required number of davits can not be placed on the vessel, other equipment must be provided which will permit of an easy launching of the boats,

The boats prescribed in the above table must be placed as far as possible under davits or any other appliances that will swing them out, while the other boats must be near at hand so that they may be placed quickly under the davits. In this connection the technical supervising officials of the Government are instructed to make more detailed regulations, while the directors of the See-Berufsgenossenschaft are directed to call attention to any deficiencies therein.

At least one-half the capacity of life-saving equipment specified in the above table must consist of lifeboats of classes 1 and 2, described below.

If the number of boats prescribed in the above table does not afford sufficient space for all persons on board the vessel, including both crew and passengers, it is provided that so far as the deck space permits, in ships of less than 14,000 cubic meters (about 5,000 register tons), auxiliary equipment shall be provided in the form of collapsible boats, life rafts, buoyant deck seats, or other similar equipment with a capacity equal to at least one-half of the prescribed regulation lifeboat equipment and in ships with a capacity of 14,000 to 28,000 cubic meters (approximately 5,000 to 10,000 register tons), two-thirds, while in ships of more than 28,000 cubic meters (about 10,000 register tons) the auxiliary boat capacity must be at least as great as that prescribed in the above table for regulation lifeboats.

Ships equipped as to the number, strength, and division of bulkheads in conformity with the requirements of the See-Berufsgenossenschaft for passenger steamers in the Atlantic and long voyage traffic need provide only one-half the prescribed auxiliary boat equipment.

Steamers making Atlantic and long voyages and carrying no passengers or less than 10 passengers are required to provide sufficient lifeboats and davits to accommodate all persons on board and, in addition, enough life buoys for each person on board and one life belt.

Steamers making long coasting trips and carrying more than 10 passengers must comply in general with the requirements for steamers making Atlantic or long voyages and carrying more than 10 passengers, with the exception that they need not provide more than one-half of the auxiliary lifeboat space called for in the requirements for the former class of steamers.

Steamers making long coasting trips and carrying either no passengers or less than 10 must provide lifeboats under davits or other similar appliances for all persons on board, in addition to 4 life buoys (one a lighted buoy) and a life belt for each person on board.

Section 6 of the regulations for steamships provides for seven classes of lifeboats as follows:

1. Boats sharply built fore and aft of wood or metal. If built of wood they are to be provided with water-tight air cases the total volume of which shall be at least equal to one-tenth the cubic capacity of the boat or with other buoyant appliances of equal

extending from the bow to the stern. The buoyancy of metal boats of this class must be not less than that required for a wooden boat of the same cubic capacity.

2. The same class of boats as specified in class 1 with the exception that at least one-half of the buoyancy may be external.

3. Boats of wood or metal which, if of wood, must be provided with water-tight air cases, the total volume of which shall be equal to at least 5 per cent of the cubic capacity of the boat, or with appliances giving equal buoyancy, at least one-half of which is external. The provisions regarding metal boats of this class are the same as for metal boats of class 1.

4. Ordinary boats of wood or metal.

5. Semicollapsible boats.

6. Collapsible boats.

7. Boats of special construction.

Boats of classes 5, 6, and 7 can be used only with the permission of the See-Berufsgenossenschaft.

Boats of classes 1 and 2 are, strictly speaking, regarded as lifeboats. Collapsible boats are regarded only as auxiliary equipment. All boats must have when fully loaded a sufficient freeboard.

Various provisions regarding the manner in which the cubic capacity of boats shall be determined are contained in these regulations and it is provided that in boats of class 1 there shall be 0.285 cubic meter (10.1 cubic feet) of space for each adult person and in the case of all other boats, 0.23 cubic meter (8.1 cubic feet).

The total cubic capacity of lifeboats may not be less than 3 cubic meters (105.9 cubic feet) except on ships engaged in short coasting voyages and those operating in bays and sounds, in which cases a boat of not less than 2 cubic meters (70.6 cubic feet) is acceptable. Smaller boats can be used only with the special consent of the directors of the See-Berufsgenossenschaft.

Numerous provisions regarding davits, blocks, runners, tackle, air tanks, etc., are also contained in the rules. The equipment to be carried in lifeboats is also provided for in detail. In all these particulars the rules of the See-Berufsgenossenschaft are similar to the requirements of section 14 of the act of March 4, 1915, of the United States.

The rules of the See-Berufsgenossenschaft in regard to the life-saving equipment for sailing vessels are quite as detailed as those for steamships. These rules also make a distinction between vessels carrying more than 10 passengers and those which carry no passengers or less than 10. They distinguish also between boats making Atlantic and long voyages and those making long coasting trips.

The general requirement is that all sailing vessels shall carry lifeboats for all persons on board in addition to an adequate number, specified in each case, of life buoys and life preservers. It is required generally that so far as possible the specified number of boats shall be carried under davits or under similar launching appliances.

The rules for sailing vessels provide for four classes of boats which correspond to the first four classes named above for steamships.

With respect to measurement capacity, stowage, davits, runners, blocks, tackle, air tanks, equipment of lifeboats, etc., these rules resemble closely the corresponding rules for lifeboats carried on steamships.

in detail in sections 35 to 52 of an imperial decree of March 14, 1898,¹ interpreting the emigration act of June 9, 1897, and that these are quite similar to those of the See-Berufsgenossenschaft. It is probable that the latter rules were modeled upon the former.

An important difference between the two sets of rules should be noted. Those relating to emigrant ships provide that where the minimum number and capacity of lifeboats prescribed in the table on page 44 are insufficient to accommodate all persons on board such ship, auxiliary equipment in the form of collapsible boats, floating deck seats, etc., shall be provided to the extent of one-fourth (instead of one-half) of the prescribed lifeboat capacity in the case of boats of less than 14,000 cubic meters (about 5,000 register tons), three-eighths (instead of two-thirds) for vessels of 14,000 to 28,000 cubic meters (5,000 to 10,000 register tons), and up to one-half (instead of 100 per cent) in the case of vessels of more than 28,000 cubic meters (10,000 register tons).

An important provision of the rules for life-saving equipment on emigrant ships is contained in paragraph 49 of the decree of March 14, 1898. This paragraph provides that for every collapsible boat there shall be at least two adult persons in the ship's crew who are skilled in handling an oar; for each ordinary rigid boat, at least three; and for every lifeboat, at least four. Paragraph 50 of this decree provides that all persons in the crew are to be examined at every opportunity that offers, in the handling of boats and the use of oars and the number, character, time, and place of these examinations are to be entered in the ship's log.

NORWAY.

Seaworthiness.—Any ship that is deemed unseaworthy and unfit for the voyage for which it is intended may be temporarily detained in any Norwegian port by the ship control in pursuance of the law giving the control its authority. In such cases, the owner or master may apply to the local maritime court within 48 hours after the information has been served on the master and request the court's decision in the case. If, in such cases, the court decides that there were no reasonable or assignable grounds for the temporary detention of the ship, the owner is entitled to compensation from the State for expenses and losses occasioned by the detention. If, on the other hand, it appears that at the time the ship is detained it is in such a defective condition that the court pronounces it unseaworthy, the owner is liable to refund to the State all expenses incurred by the survey and detention.²

Water-tight compartments. The law concerning the public supervision of the seaworthiness of ships, dated June 9, 1903, and amended September 18, 1909, states that "the King shall determine whether, and to what extent, passenger steamers shall be provided with water-tight bulkheads."³ This law further provides as follows:

Special regulations as to the construction and building of passenger ships, their outfit, equipment, and trade, and as to the ship control therewith, shall be given by

¹ Bekanntmachung, betreffend Vorschriften über Auswandererschiffe.

the King, or by whomever he may authorize. In pursuance of these regulations the ship control shall ascertain:

1. Whether the hull and appurtenances of the ship are in a sound and satisfactory condition for the intended trade.

2. Whether its engines, boilers, and pipe connections are properly made, fitted, and kept in repairs, provided with the necessary controlling and safety appliances, and in full working order, and whether the engines are sufficiently strong and of substantial character.

3. Whether boats, life-saving appliances, lights, fog and distress signals, compasses and instruments, fire-extinguishing appliances, protective arrangements on and below decks, and the rest of the equipment are of such a kind and in such a condition as required by provisions in force.¹

Life-saving equipment.—With specific reference to life-saving appliances, it is provided that:

Instructions respecting the life-saving appliances with which ships must be provided shall be given by the King or by whomever he may thereto authorize.

Such instructions shall be issued respecting the number, size, equipment, and description of boats and life rafts, respecting the number and description of life buoys, and similar life-saving appliances, and respecting the storage and preservation of life-saving appliances.²

FRANCE.

Seaworthiness.—The seaworthiness of all vessels leaving French ports is assured by the provisions of chapters 1 and 2 of the law of April 17, 1907, relative to the security of maritime navigation and the regulation of work on board ships, and by the regulations issued pursuant thereto in the ministerial decrees of September 20 and 21, 1908, and May 17, 1909.

Article 1 of the law of April 17, 1907, requires in general terms that no French sailing vessel, steam vessel, or ship driven by other mechanical power, having a gross tonnage of more than 25 tons and used for fishing, commercial, or pleasure purposes shall leave any French port without first securing an inspection certificate certifying that all parts of the ship are of good construction and in good state of preservation, navigability, and operation or unless it has a first-class rating by one of the approved classification societies. This article provides also for careful inspection of boiler, engines, and other machinery of vessels and of their general equipment. These inspections are intended to make certain that no unseaworthy ship leaves a French port.

For further details as to the nature, extent, and frequency of the inspections required under this law, reference is made to the discussion of "Inspection laws of France," given on pages 63-66 of this report.

Water-tight compartments.—The general rules relating to water-tight compartments are contained in paragraph 19 of the ministerial instructions issued May 17, 1909. These rules provide that every sailing ship built of steel or iron shall have a water-tight collision bulkhead placed fore at a suitable distance from the stem, suitably supported and reenforced and containing no opening or vent.

Steamships must be provided with the following water-tight cross bulkheads built of iron or steel suitably supported and reenforced: (a) A collision bulkhead placed in the bow, at a suitable distance from the stem and with no door or opening; (b) one bulkhead in front and one in the rear of the engine room and stokehold; (c) in the case of screw steamers, a bulkhead for the stuffing boxes of the

¹ Law concerning the public supervision of the seaworthiness of ships, etc. June 9, 1907, as amended.

screw shaft; (d) finally, intermediate bulkheads in any number desired, provided the length of the compartment does not exceed 27.5 meters (90.2 feet). Exceptions to the last-named provision are granted in exceptional cases when the same are justified by the character of the cargo which the ship is designed to carry.

If there are openings in the bulkheads, other than the collision bulkhead, the inspection officer must be assured that they are provided with systems for water-tight closing that can be regulated from between decks at a point above the load line.

Wooden ships must have water-tight compartments, either of wood or iron, in front and behind the engine room and stokehold. If constructed of wood, they must be covered with sheet iron.

If the engine room is not placed aft, safety requires that there shall be, on ships with metallic hulls, a water-tight tunnel closed by a water-tight door and extending from the bulkhead surrounding the stuffing box to the compartment behind the engine room.

Life-saving equipment.—The principal regulations regarding the life-saving equipment of French vessels are contained in articles 76 to 103 of the decree of September 21, 1908, issued under the authority of sections 53 and 54 of the law of April 17, 1907. These regulations provide in a general way that the number of lifeboats and life-saving apparatus which the ship must carry depends primarily upon whether or not the ship is engaged in the transportation of passengers. All ships having on board more than 10 persons, not including the captain, master, or officers and members of the crew, are regarded as passenger ships, even though they may not be continuously engaged in this service. (Art. 76.)

Ships are classified, moreover, according to the character of their voyages into two groups, as follows (art. 77):

1. Ships making voyages "au long cours" and ships in the coasting trade beyond the limits specified in group 2.

2. Ships making voyages: (a) In estuaries or in mouths of rivers; (b) in the bays and roadsteads, whether they come in direct contact with the open sea or are closed; (c) between the coasts of France, Corsica, and Algeria, on the one hand, and the islands which lie within 30 miles of those coasts, on the other; (d) short excursions on the ocean; (e) in the lakes and basins and pools of salt water.

The types of boats provided for, under these regulations are as follows (art. 78):

I. Boats of proper construction, built of wood or metal, having a capacity of at least 3 cubic meters (105.9 cubic feet) and with buoyancy secured by one of the following provisions: (a) Water-tight air tanks having capacity equal to at least one-tenth of the cubic capacity of the boat; (b) water-tight tanks or other insubmergible appliances with a buoyancy equal to that of boats mentioned under (a). This buoyancy is assured in part, at least, by means of air tanks or buoyant appliances placed within the boat, the remaining buoyancy being secured by a ring with buoyant substances placed outside the boat. The volume of the buoyant appliances must be more than 25 per cent above that of the air tanks which they replaced.

II. Boats of proper construction, built of metal or wood, having a capacity of at least 3 cubic meters (105.9 cubic feet) and with a buoyancy of less than half that of boats of Type I. The buoyancy is assured by the same requirements, the buoyant appliances being placed in whole or in part on the inside or outside of the boat.

III. Boats of wood of the proper construction and having a capacity of at least 3 cubic meters (105.9 cubic feet).

Passenger ships of the first class noted above, namely, those making voyages "au long cours" or in the coasting trade, must be

minimum cubic capacity specified in the following table, which is taken from article 79 of the decree of September 21, 1908:

Gross tonnage.	Minimum number of boats under davits.	Total minimum capacity of boats.	Gross tonnage.	Minimum number of boats under davits.	Total minimum capacity of boats.
		<i>Cubic feet.</i>			<i>Cubic feet.</i>
200 ^a to 400	2	283	5,500 to 6,000.....	10	3,567
400 to 600.....	2	424	6,000 to 6,500.....	12	3,991
600 to 800.....	3	706	6,500 to 7,000.....	12	4,202
800 to 1,000.....	4	883	7,000 to 7,500.....	12	4,414
1,000 to 1,500.....	4	1,201	7,500 to 8,000.....	12	4,556
1,500 to 2,000.....	6	1,695	8,000 to 9,000.....	14	5,015
2,000 to 2,500.....	6	1,978	9,000 to 10,000.....	14	5,262
2,500 to 3,000.....	6	2,048	10,000 to 11,000.....	14	5,474
3,000 to 3,500.....	8	2,401	11,000 to 11,500.....	14	5,827
3,500 to 4,000.....	8	2,578	11,500 to 13,000.....	14	6,357
4,000 to 4,500.....	8	2,790	13,000 to 15,000.....	14	6,710
4,500 to 5,000.....	8	2,896	15,000 and over.....	16	7,063
5,000 to 5,500.....	10	3,390			

^a Ships of a gross tonnage of less than 200 tons are required to carry 1 boat of Type I or Type II.

The regulations stipulate that at least one-half of the lifeboats prescribed in the above table must be of Type I and must have in the aggregate a capacity at least equal to one-half of the total minimum capacity specified in the table. The other life-saving boats may consist of any of the other types except that there may not be in any case more than two boats of Type III. (Art. 79.)

For passenger ships of the second class noted above, namely, vessels other than those making voyages "au long cours" or in the coasting trade, the following requirements prevail: If the vessel is of 100 tons gross measurement or more, it shall be provided with at least two boats of Types I or II; ships of less than 100 tons are required to have at least one boat of either of these types. (Art. 80.)

Ships of class 1 or class 2 not engaged in the transportation of passengers must have on board as many boats of the types specified in article 78 as is necessary to accommodate all persons on board, but at least one-half must be of Types I or II. (Art. 81.)

The regulations also provide that at least one of the lifeboats must be large enough and equipped with sufficient appliances to permit its carrying without danger the largest casting anchor. (Art. 82.)

Numerous requirements relate to the length, material, and condition of the air tanks and lifeboats (art. 83), and to the number of persons that can be carried (art. 85). Rules are given for the computation of the cubic capacity of boats (art. 85). The equipment of lifeboats and the manner in which they shall be launched are also regulated in detail (art. 86).

An important exception is made to the rules above stated in the case of passenger ships of the first class. Article 87 of these rules provides that if the lifeboats prescribed in the above table are insufficient for the accommodation of all persons on board the ship, additional boats of any type or size and life rafts shall be provided to the extent of 75 per cent of the required regulation lifeboat capacity in the case of ships of 5,000 tons or more and 50 per cent in the case of smaller ships.

It is also provided that there shall not be a greater number of additional boats or life rafts required than is necessary to hold or carry the total number of persons on board the ship.

On passenger boats of the second class there must be on board, in addition to the boats provided for in article 80, additional boats of any type or size or life buoys, whether individual or not, in numbers sufficient, together with the regular boats required, to hold, carry, or sustain every person on board the vessel. (Art. 87.)

The regulations of September 21, 1908, contain numerous provisions regarding the material and method of construction of life rafts, lifeboats, and life belts. (Arts. 88-95.)

Vessels having a sufficient number of water-tight compartments to enable the ship to float when one of the compartments is flooded are required to have on board only one-half of the additional boats and rafts required under article 87 of the present regulations, but this exemption does not extend in any case to life belts, etc. Lifeboat drills under the supervision of the Government inspectors must take place at least once every three months. At these times the inspector may require that the boats be launched. Article 90 contains other regulations regarding the drills.

The French Government has not yet adopted the London Convention on Safety of Life at Sea, either in whole or in part. At the general convention of the Comité Central des Armateurs de France, held March 12, 1915, the general secretary in his report for the year 1914 made the following reference to the London convention:

The London Conference on Safety of Life at Sea was concluded by the international convention of January 20, 1914. This organization (le Comité) had assigned the study of these rules to a special technical commission with a view to securing its comments thereon prior to the introduction of a law ratifying the convention. The work of the commission, which had been actively pursued under the direction of M. Groslou, consulting engineer of the Compagnie Générale Transatlantique, was interrupted by the war.

JAPAN.

The principal laws relating to the construction and equipment of Japanese vessels are contained in the ship-inspection law of April, 1896, the rules for the building of vessels issued April, 1900, in notification No. 16 of the Department of Communications, imperial ordinance No. 414 of December, 1900, containing regulations relating to the inspection of foreign vessels, notification No. 87 of the Department of Communications, issued in December, 1900, and containing detailed regulations relating to the enforcement of the ship-inspection law, and notification No. 88 of the Department of Communications, issued in December, 1900, and containing ship-inspection regulations.

Seaworthiness.—The laws and regulations of Japan contain, it appears, no reference to the general subject of seaworthiness. There is not, for example, as in the British laws, any provision for the detention of unseaworthy ships. Apparently, the detailed laws and regulations regarding inspection of vessels are considered ample on this point.

Water-tight compartments.—This subject is covered in considerable detail in the following provisions of the Rules for the Building of Vessels:

1. In steamers, water-tight bulkheads shall be fitted at each end of the vessel and before and abaft the machinery room.

The collision bulkhead shall be fitted at not less than one-twentieth of the length of the vessel abaft the stem at the lowest deck and be extended to the upper deck.

The engine room bulkheads and aftermost bulkhead shall be extended to the upper deck except in awning-decked vessels where they may be stopped at the second deck provided that a deep web frame, partial bulkhead, or the equivalent be fitted in the 'tween-deck over each water-tight bulkhead.

2. In steamers 280 feet and above in length, or in steamers in which the fore engine-room bulkhead is fitted forty-two one-hundredths of the length of the vessel or more abaft the collision bulkhead, an additional bulkhead shall be fitted about midway between the collision bulkhead and the fore engine-room bulkhead, extending to the upper deck; except in awning-decked vessels, where it may be stopped at the second deck, provided that a deep web frame, partial bulkhead, or the equivalent be fitted in the 'tween-deck over the bulkhead.

In steamers of 330 feet and above in length, an additional bulkhead, besides the bulkhead last mentioned shall be fitted about midway between the aftermost bulkhead and after engine-room bulkhead, extending to the same height.

In steamers 400 and under 470 feet in length, seven water-tight bulkheads shall be fitted; in steamers 470 and under 540 feet in length, eight water-tight bulkheads shall be fitted; and in steamers 540 and under 600 feet in length, nine water-tight bulkheads shall be fitted. These bulkheads shall be extended to the height as described above.

When a bulkhead is not completed at one pair of frames to its required height per rule, the water-tightness of the part between the upper and lower bulkheads shall be effected with a "metal to metal" connection.

3. In sailing vessels, the collision bulkhead shall be fitted as is required for steamers.

4. No limber nor other holes shall be cut in the collision bulkhead. The former shall not be cut in the other water-tight bulkheads also. Sluice valves may be fitted in the aftermost bulkhead provided they are arranged so as to be at all times accessible.

5. The plating of bulkheads shall be of the thickness prescribed in Table 1 (not reproduced here), fitted between double angles of the same size as the frame angles prescribed in the same table, and shall be connected to the floor plates by a double row of rivets, and to the decks and inner bottom plating of the double bottoms, by double angle bars of the same size as the reverse frames prescribed in Table 1.

6. Bulkheads shall be stiffened vertically on one side and horizontally on the other, with angle bars of size not less than the frame angles prescribed in Table 1. The vertical stiffeners shall not be more than 2 feet 6 inches apart, and to extend from the upper part of the bulkheads to the bottom floor plate; and where a double bottom is fitted, they shall be connected to the inner bottom plating by bracket plates. The horizontal stiffeners shall be fitted below the lowest laid deck not more than 4 feet apart.

The bulkheads forming the ends of ballast tanks shall be fitted with extra strong stiffeners.

The vertical stiffeners fitted to the bulkhead between the upper and second deck may be of the size of reversed frame prescribed in Table 1, except those to the collision bulkheads and aftermost bulkhead.

In collision bulkheads and other bulkheads of which the greatest breadth is 40 feet and above, the horizontal stiffeners shall be of bulb angles, 1 inch deeper than required in Table 1 for bulb angle frames. They shall be attached with brackets to the vessel's side.

Bulkheads of 36 feet and under 45 feet in breadth shall be additionally stiffened by a vertical web, extending from the lowest tier of beams to the bottom; those of 45 feet and under 55 feet in breadth, by two vertical webs; and those of 55 feet and under 60 feet in breadth, by three vertical webs.

7. In vessels of a depth to require second tier of beams, third tier of beams, or hold beams, when the bulkheads are not supported on both sides by a laid deck or when web frames or deep framings are fitted in lieu of the second tier of beams, third tier of beams, or hold beams, the bulkheads shall be additionally stiffened in way of the second tier of beams, third tier of beams, or hold beam stringer plate or of the side stringer midway between the bottom and the lowest laid deck, by a semibox beam of the scantlings required by article 11 of Chapter X for such beams.

8. Where web frames are fitted in lieu of two tiers of beams, the bulkheads shall be additionally stiffened by two semibox beams of the size required by article 11 of Chapter X, each in way of the side stringer. Such bulkheads though under 36 feet in breadth shall be vertically stiffened by a web at the middle line.

10. The water-tightness of the collision bulkhead and aftermost bulkhead shall be tested by filling the fore and aft peaks with water to the height of the maximum load water line and the water-tightness of the other bulkheads shall be tested by a hose.

Life-saving equipment.—Article 57 of the Ship Inspection Regulations contained in Notification No. 83 of the Department of Communications, issued December, 1900, provides that all passenger vessels, except those operating on smooth-water routes, must carry lifeboats with proper appliances for getting them readily and safely into the water in accordance with the tonnage capacity of the vessel as indicated in the following table:

Gross tonnage.	Minimum number of boats under davits.	Total minimum cubic capacity.	Gross tonnage.	Minimum number of boats under davits.	Total minimum cubic capacity.
		<i>Cubic feet.</i>			<i>Cubic feet.</i>
Less than 100.....	2	200	3,750 and under 4,000.....	8	2,700
100 and under 200.....	2	250	4,000 and under 4,250.....	8	2,800
200 and under 300.....	2	300	4,250 and under 4,500.....	8	2,900
300 and under 400.....	2	350	4,500 and under 4,750.....	8	3,000
400 and under 500.....	2	400	4,750 and under 5,000.....	10	3,300
500 and under 600.....	3	600	5,000 and under 5,250.....	10	3,400
600 and under 700.....	3	700	5,250 and under 5,500.....	10	3,500
700 and under 800.....	4	800	5,500 and under 5,750.....	10	3,600
800 and under 900.....	4	900	5,750 and under 6,000.....	10	3,750
900 and under 1,000.....	4	1,000	6,000 and under 6,250.....	12	4,000
1,000 and under 1,250.....	4	1,200	6,250 and under 6,500.....	12	4,100
1,250 and under 1,500.....	6	1,500	6,500 and under 6,750.....	12	4,200
1,500 and under 1,750.....	6	1,700	6,750 and under 7,000.....	12	4,300
1,750 and under 2,000.....	6	1,800	7,000 and under 7,250.....	12	4,400
2,000 and under 2,250.....	6	1,900	7,250 and under 7,500.....	12	4,500
2,250 and under 2,500.....	6	2,000	7,500 and under 7,750.....	12	4,600
2,500 and under 2,750.....	6	2,050	7,750 and under 8,000.....	12	4,700
2,750 and under 3,000.....	6	2,100	8,000 and under 8,500.....	14	5,000
3,000 and under 3,250.....	8	2,400	8,500 and under 9,000.....	14	5,100
3,250 and under 3,500.....	8	2,500	9,000 and under 10,000.....	14	5,250
3,500 and under 3,750.....	8	2,600	10,000 and above.....	16	5,500

At least one-half of the cubic capacity of the boats specified in the above table must be in regulation lifeboats in the case of vessels of not less than 300 tons gross register.

If the vessel is equipped with boats sufficient to accommodate the prescribed number of passengers and the entire crew, at the rate of 10 cubic feet per adult, it is not necessary to make up any deficiency even if the number or cubic capacity of the boats falls below the minimum requirements of the above table.

In the case of vessels temporarily carrying a great number of fishermen, emigrants, or laborers within the limits of the grand coasting trade, and in the case, also, of vessels carrying troops the number of the crew is deducted from the total number of persons on board the vessel in determining the required lifeboat capacity.

In computing the required boat capacity under the above table, the capacity of steam launches, ordinary boats of less than 50 cubic feet capacity, and lifeboats of less than 100 cubic feet are not included.

In regard to the construction of lifeboats, article 58 of the Ship Inspection Regulations contained in Notification No. 83 of the Department of Communications makes the following requirements:

1. Lifeboats shall be of whaleboat form.

materials. In this connection it may be of interest to note that 1.25 cubic feet of cork is considered equivalent to 1 cubic foot of air-tank space.

3. The general requirement is that air tanks shall be constructed of copper or yellow metal.

4. Life lines shall be becketted around the outside of lifeboats.

On vessels under 100 tons gross register boats without davits as well as life rafts, life buoys or life belts may be carried instead of the boats indicated in the above table.

On vessels of more than 100 tons gross register, lifeboats without davits, as well as life rafts, life buoys or life belts may be used to provide accommodations beyond the minimum required in the above table. On vessels required to have at least 10 boats the number of boats with davits may be reduced by 2; and on vessels required to have not less than 6 boats davits may be dispensed with in the case of 1 boat.

The table of lifeboat equipment given above, it will be noted, specifically applies to passenger vessels other than those operating on smooth-water routes; but article 60 provides that cargo vessels, except those operating on smooth-water routes, shall also carry boats ready for use with proper appliances for getting them quickly and safely into the water. The number of lifeboats must be sufficient to provide for every person on board at the rate of 10 cubic feet per adult. On cargo vessels of not less than 300 tons gross register operating in the grand coasting and ocean trades one of the boats must be a regulation lifeboat of the type required for passenger vessels.

In cargo vessels of less than 100 tons gross measurement, lifeboats without davits, as well as life rafts, life buoys or belts may be carried in lieu of the regulation lifeboats.

The general requirements regarding life buoys are indicated in the following statement:

Class of trade.	Number of life buoys required.	
	On steam-ships.	On sailing vessels.
Grand coasting trade.....	4	2
Ocean-going route.....	6	4
Ordinary coasting trade.....	2	2
Smooth-water routes.....	2	

Steam vessels under 5 tons gross register plying on smooth-water routes and sailing vessels under 30 tons gross, or 300 koku, may be equipped with only one life buoy.

Passenger vessels, except those operating on smooth-water routes, must carry at least two more life buoys than the number specified in the above table, and in no case may the number of life buoys be less than that of the lifeboats.

4. INSPECTION OF VESSELS.

UNITED STATES.

The principal laws governing inspection of vessels of the United States are to be found in sections 4417 and 4418 of the Revised

made pursuant to these and other statutes are contained in a book of General Rules and Regulations Prescribed by the Board of Supervising Inspectors, issued August 11, 1915.

The statutes make the following requirements:

- (1) As to frequency of inspection: Once at least in every year.
- (2) As to persons making the inspection: The local inspectors of the Steamboat-Inspection Service.
- (3) As to matters inspected:
 - (a) Hulls of all steam vessels, sailing vessels of more than 700 tons carrying passengers for hire, and all other vessels of over 100 tons carrying passengers for hire.
 - (b) Accommodations for passengers and crew.
 - (c) Seaworthiness and general condition.
 - (d) Compliance with all the requirements of law in regard to fires, boats, pumps, hose, life preservers, floats, anchors, cables, and other things. (See also secs. 4470-4476.)
 - (e) Any other matter which the local inspectors may deem necessary to test the "sufficiency" of the vessel and of her equipment.
 - (f) Boilers and their appurtenances.
- (4) As to nature and character of inspections:
 - (a) Hulls of all vessels inspected shall be suitable for service in which employed.
 - (b) Accommodations for passengers and crew shall be suitable.
 - (c) Condition of vessel to be such as "to warrant the belief that she may be used in navigation with safety to life."
 - (d) Full and faithful compliance with all laws regarding fires, boats, pumps, etc., enumerated above under (3).
 - (e) To test sufficiency of a vessel and its equipment "any other suitable means" may be adopted.
 - (f) Boilers to be (1) "well made, of good and suitable material"; (2) to be so constructed that all pipes and tubes exposed to heat shall be of proper dimensions and free of obstructions; (3) to have sufficient spaces between and around the flues; (4) to have safe and satisfactory construction, shape, condition, arrangement, and material in flues, boilers, furnaces, safety valves, fusible plugs, and other appurtenances. Boilers also to be subjected to a hydrostatic test one and one-half times the working steam power.

The inspections made by the Steamboat-Inspection Service cover many other subjects, among which may be enumerated the following: Manning of inspected vessels (sec. 4463); number of passengers allowable (secs. 4464-4469); character of merchandise carried (secs. 4474 to 4476); mode of packing dangerous articles (sec. 4475).

The inspection laws referred to apply to "all steam vessels navigating any waters of the United States which are common highways of commerce or open to general or competitive navigation, excepting public vessels of the United States, vessels of other countries, and boats propelled in whole or in part by steam for navigating canals."¹

It is also explicitly provided, but with an important proviso, that the following inspection laws shall apply to "all foreign private steam vessels carrying passengers from any port of the United States to any other place or country":

- Sec. 4417. Inspection of hulls.
- Sec. 4418. Inspection of boilers.
- Sec. 4421. Certificate of inspection.
- Sec. 4422. License to carry gunpowder.
- Sec. 4423. Disposal of certificate of inspection.
- Sec. 4424. Carrying passengers or gunpowder contrary to law.
- Sec. 4470. Precautions against fire.
- Sec. 4471. Fire pumps and hose.
- Sec. 4472. Dangerous articles not to be carried on passenger steamers.
- Sec. 4473. Penalty for unlawfully carrying cotton or hemp.

Sec. 4479. Fire extinguishers.

Sec. 4482. Life preservers for river steamers carrying passengers.

Sec. 4488. Lifeboats, etc., on ocean, lake, and sound steamers.

Sec. 4489. Penalty for failure to provide lifeboats, etc.

Sec. 4496. Duties of customs officers.

Sec. 4497. Penalty for omission of duty by customs officer.

Sec. 4499. Penalty for failure to comply with specified laws.

Sec. 4500. Penalty in cases not provided for.

The important proviso referred to in the preceding paragraph is that foreign passenger steamers which belong to countries having inspection laws approximating those of the United States, and which carry unexpired certificates of inspection issued by the proper foreign authorities, are exempted from inspection by officials of the United States as to the requirements covered in the above-named sections. Such steamers are, however, subject to such inspection as is necessary to satisfy the officials that the condition of the vessel, its boilers, and its life-saving equipment are as stated in the certificate issued by the foreign Government.

This exemption in favor of foreign passenger steamers is conditioned, moreover, on the granting of the same privilege to the steamships of the United States visiting foreign countries.

Section 4400 of the Revised Statutes has been referred to in considerable detail, since it has been the subject of much discussion in connection with section 14 of the act of March 4, 1915 (seamen's act).

The inspection service of the United States is composed of the following persons: One supervising inspector general; 10 supervising inspectors; numerous local inspectors.

The supervising inspector general and the supervising inspectors assemble as a board at least once each year. This board establishes, subject to the approval of the Secretary of Commerce, all necessary regulations required to carry out in the most effective manner the provisions of the various statutes on inspection of vessels.

GREAT BRITAIN.

The statutes of Great Britain make the following requirements for the survey of passenger steamships, which are contained chiefly in the Instructions as to the Survey of Passenger Steamships issued by the Board of Trade in 1913:

(1) As to frequency of inspections: Once at least in each year for passenger steamers carrying more than 12 passengers. (Sec. 47 of Instructions.)

(2) As to persons making the inspection: Shipwright surveyor, in the case of iron ships, and a shipwright surveyor and engineer surveyor for all other ships. (Sec. 272 of merchant shipping act of 1894.)

(3) As to matters inspected (sec. 272 of merchant shipping act of 1894):

(a) Hulls.

(b) Boats, life buoys, lights, signals, compasses, and shelter for deck passengers.

(c) Machinery, safety valves, and fire hose.

(d) Number of passengers to be carried.

(e) Certificates of master, mate or mates, and engineers.

(4) As to character of inspection:

(a) Hulls shall be sufficient for service intended and in good condition.

(b) Boats, life buoys, lights, etc., shall meet requirements of the act.

(c) Machinery must be "sufficient for the service intended and in good condition."

(4) As to character of inspection—Continued.

(d) Number of passengers to be distinguished, if necessary, as to number to be carried on the deck and in the cabins and in different parts of the deck and cabins, subject to variations on account of season, nature of voyage, cargo carried, or other circumstances.

(e) Certificates of officers must be satisfactory.

Inspection certificates granted to passenger steamers are of six classes, as follows:¹

1. Certificate for foreign-going steamships, i. e., for steamships plying beyond the limits of the home trade.

2. Certificate for steamships plying at sea within the limits of the home trade.

3. Certificate for steamships plying along the coast within defined limits, during daylight, and in fine weather, between April 1 and October 31.

4. Certificate for steamships plying in partially smooth water.

5. Certificate for steamships plying in smooth water.

6. Certificate for motor launches plying in summer, during daylight, and in fine weather.

The expression "foreign-going ships" includes every ship employed in trading or going between some place or places in the United Kingdom, and some place or places situated beyond the following limits; the coasts of the United Kingdom, the Channel Islands, and Isle of Man, and the continent of Europe between the River Elbe and Brest, inclusive.

The expression "home-trade ships" includes every ship employed in trading or going within the following limits: The coasts of the United Kingdom, the Channel Islands, and Isle of Man, and the continent of Europe between the River Elbe and Brest, inclusive.

Except as regards life-saving appliances, deck shelter and weather cloths to poop or bridge deck rails, excursion steamships * * * must comply with all the requirements for home-trade steamships; they must be decked and in all respects of such substantial character as to be capable of standing bad weather in the event of being caught in it.

Steamships are regarded as going to sea, and as being seagoing steamships, when they go outside the partially smooth water limits.

The inspection regulations relating to passenger steamers are grouped under three principal heads, as follows: (a) Survey of hull (Part II of Instructions); (b) survey of equipments (Part III of Instructions); (c) boilers and machinery (Part IV of Instructions).

In the survey of the hull, an examination inside and out is to be made at least once in every year "at such time as is most convenient to the owners."² The same is true of the water-tight compartments, detailed reference to which has been made on pages 35-39.

The regulations as to survey of equipments relate to the adjustment of compasses in new vessels, compass certificates of masters and mates, number of compasses, load lines, steering gear, helm indicators, fire hose, deck pumps, sounding pipes, engine-room pump fittings, anchors, chains, cables, hawsers, distress signals, rocket apparatus, life buoy lights, etc.

¹ Instructions as to the Survey of Passenger Steamships, issued by Board of Trade in 1913, pp. 6-7.

² Ibid. see 47, p. 31.

In the regulations as to boilers and machinery the following principal rules regarding the testing of boilers may be noted:

1. Working pressure for all boilers to be determined by surveyor by series of calculations of the strength of the various parts, taking into consideration the workmanship and material.

2. All new boilers to be tested to double the working pressure that will be allowed.

3. Full hydraulic test to double the working pressure for the boilers of all steamships that have not previously had a passenger certificate; also at each usual survey for boilers which are too small for the surveyor to enter or satisfactorily to examine internally.

4. Old boilers after undergoing important repairs to be tested to at least one and one-half times and up to one and three-fourths times the working pressure.

5. Test to continue for at least 10 consecutive minutes.

The rules regarding the material used in the manufacture of boiler plates, the process of manufacture, the nature of tests of plates, bars, rivets, tubes, forgings, castings, and other parts of boilers are, like the corresponding rules of the Steamboat-Inspection Service in the United States, very technical and exacting in their requirements.

The engineer surveyor in the Board of Trade inspection service corresponds to the inspector of boilers in the American inspection series. To him is intrusted the inspection of machinery, safety valves, fire hose, etc., and the certificates of engineers, while the other duties enumerated above are performed by the shipwright surveyor, who since the merchant shipping act of 1906 has been designated as ship surveyor and who corresponds to the inspector of hulls in the United States.

The above requirements, it should be noted, relate only to passenger steamships that are not emigrant ships and apply, therefore, to all "home-trade" passenger vessels and to all foreign-going passenger vessels which either do not go beyond Europe or do not carry steerage passengers.

Emigrant ships, on the other hand, are subject to numerous special and additional requirements and can not clear from any British port without a certificate that all of these requirements have been complied with.

An emigrant ship is defined as any ship, whether British or foreign, which carries on any voyage from the British Islands to any port out of Europe and not within the Mediterranean Sea more than 50 steerage passengers, or a greater number than in the proportion of one statute adult to every 33 tons of the registered tonnage in the case of a sailing ship, or every 20 tons in the case of a steamship.

The requirements as to the inspection of emigrant ships are very detailed and rigid. Since practically all of the larger British passenger steamers operating to the United States are classed as emigrant ships, an examination of the regulations applying to this class of vessels is of interest.

The regulations as to the inspection of emigrant ships are found in the "Instructions Relating to Emigrant Ships," issued by the Board of Trade in 1911.

These instructions provide that the surveys and inspections neces-

the service intended are to be made under the direction of the emigration officer of the port for the district. The actual work of inspection is performed by such members of the survey staff in that district as the emigration officer may select.

The subjects covered by the surveys and inspections of emigrant ships are as follows:

- | | |
|---|---|
| <p>A. Survey of hull and equipment:</p> <ol style="list-style-type: none"> 1. Seaworthiness. 2. Freeboard. 3. Compasses. 4. Life-saving appliances. 5. Signals. 6. Means for extinguishing fire. <p>B. Manning:</p> <ol style="list-style-type: none"> 1. Crew. 2. Deck hands. 3. Engine-room staff. 4. Sailing ships. 5. Stores and cooks. 6. Interpreters. 7. Surgeons. <p>C. Passenger accommodations:</p> <ol style="list-style-type: none"> 1. Construction of decks. 2. Berths. 3. Doors. 4. Stairways. 5. Lighting. 6. Ventilation. | <p>C. Passenger accommodations—Con.</p> <ol style="list-style-type: none"> 7. Water-closets. 8. Hospitals. 9. Dispensaries. <p>D. Number of passengers:</p> <ol style="list-style-type: none"> 1. Passenger decks. 2. Rules as to number. 3. Measurement of spaces for passengers. <p>E. Water and provisions:</p> <ol style="list-style-type: none"> 1. Quantity of provisions. 2. Quantity of water. 3. Water tanks. 4. Medical stores. <p>F. Cargo:</p> <ol style="list-style-type: none"> 1. General character of cargo. 2. Manner of stowing cargo. 3. Dangerous goods. 4. Offensive cargoes. <p>G. Medical instructions.</p> <p>H. Miscellaneous.</p> |
|---|---|

It will be necessary to refer only to a few of the points covered in the instructions as to emigrant ships. One of the most important is that no emigrant ship can clear from a British port without a certificate from the emigration officer that she is "seaworthy, in safe trim, and in all respects fit for the intended voyage." The rules as to freeboard, compasses, life-saving appliances, signals, and means for extinguishing fire are formulated with a view to providing that the ship shall be at all times seaworthy and safe.

In regard to the manning of emigrant ships, the general rule is that they shall be manned with an efficient crew to the satisfaction of the emigration officer. At the same time, the regulations specify the number of deck hands to be carried and the number of engineers, donkeymen, greasers, storekeepers, and firemen. This matter has been referred to in more detail on pages 85–87 of this report under the subject of "Number of crew." It is sufficient at this point to say that the number of deck hands varies with the total capacity of boats and rafts required under the life-saving appliance rules of the Board of Trade; while the number of men of each class in the engine room varies with the horsepower of the engines, except in the case of the firemen, the number of which depends upon the area of fire-grate surface in the boilers.

A number of the regulations under the heading of passenger accommodations relate to the construction of decks and are formed with the view to securing the maximum degree of safety. The same is true also of the rules as to the stairways and lighting and of those

GERMANY.

Reference has already been made to the fact that the drafting and preparation of rules relating to the seaworthiness of ships, the condition of hull, boilers, engines, and equipment, are left chiefly to the See-Berufsgenossenschaft.

The principal exception is made in the case of boilers, the regulations concerning which are to be found in the industrial code (*Gewerbeordnung*), sections 24 and 25, and in the decrees of December 17, 1908, and August 15, 1914, issued pursuant thereto and containing the general police regulations concerning the construction of steamship boilers.

The regulations concerning boilers of steamships appear to be in all respects as detailed and rigid as those in the United States. In regard to the hydrostatic test to which boilers are subjected, the regulations provide that in the case of boilers having less than 10 atmospheres (150 pounds to the square inch) of excess pressure (*Ueberdruck*) the test pressure shall be one and one-half times the intended working pressure, with at least 1 atmosphere (15 pounds) of additional pressure. In the case of boilers having more than 10 atmospheres of excess pressure, the additional test pressure shall in every instance be 5 atmospheres (75 pounds).¹

The walls of the boiler must be strong enough to withstand the test pressure during the entire continuance of the inspection without becoming thin or showing any permanent changes in form. The walls are to be regarded as thin if during the test the water comes through the walls in any other form than that of fine drops.

Apparently the inspection of steamship boilers is left to the local boiler inspectors, who are not, it seems, under the jurisdiction of any maritime authorities.

Germany has no bureau or department with powers corresponding to those exercised by the marine department of the Board of Trade, and, it is said, attempts to institute such an organization have always met with strong opposition in shipping circles.² Most of the accident prevention requirements that are intrusted in England to the Board of Trade have in Germany been provided for by the See-Berufsgenossenschaft. This authority has devolved upon the See-Berufsgenossenschaft despite the fact that it has at its disposal very limited authority to enforce compliance with the regulations which it regards as proper. That it has accomplished its purpose is a striking tribute to the spirit of cooperation and conciliation of the German shipowners.²

In drafting the technical rules relating to the construction of ships and their equipment the See-Berufsgenossenschaft has worked in conjunction with the Germanischer Lloyd classification society. In so far as regulations concerning the operation of ships is concerned, the See-Berufsgenossenschaft has itself formulated the rules.

At the head of the Berufsgenossenschaft is a general board of directors with a chairman selected from its own members.

To facilitate the work of administration the organization is divided into six sections, as follows: Section I, with headquarters in

¹ Bekanntmachung betreffend allgemeine polizeiliche Bestimmungen über die Anlegung von Schiffen.

Papenburg; Section II, with headquarters in Bremen; Section III, with headquarters in Hamburg; Section IV, with headquarters in Kiel; Section V, with headquarters in Stettin, and Section VI, with headquarters in Danzig.

Each section has its board of directors, which is composed of four members in Section I, five members in Sections II, III, and IV, and three members in Sections V and VI. The boards of directors in the several sections are composed of the most prominent representatives of the German merchant marine.

The active enforcement of the interests of the See-Berufsgenossenschaft is intrusted to special representatives, called Vertrauensmännern, who are selected from shipowners, captains, teachers in the navigation schools, and other persons intimately connected with shipping. From all decisions of the representatives of the See-Berufsgenossenschaft in cases of loss an appeal to the higher tribunals is permitted.

The staff of the See-Berufsgenossenschaft includes a large number of technical experts who are qualified to carry on the inspections and examinations required under the rules of that organization.

NORWAY.

It is provided that the general supervision of ships and of everything essential to their seaworthiness shall be in charge of such ministry as the King may direct, and that a special department of this ministry (the Mercantile Marine Department) be established for the purpose of transacting the business connected with the ship control.¹

The ministry is authorized to exercise its powers of supervision by the aid of: (1) Ship inspectors; (2) port inspectors; (3) technical surveyors; (4) persons nominated for the occasion; (5) consuls.²

The duties of ships' inspectors are chiefly to make investigations in relation to ship casualties; those of the port inspectors, to make any surveys and inspections of ships, appurtenances, and equipment that involve nautical insight and training; while those of the surveyors are chiefly of a technical character. All of the above officials are appointed by the King.

The law further states:

The ship control shall, as far as possible, keep informed of the state of the ships belonging to the district and of the Norwegian ships trading in the district, and shall take steps when there are any reasons for so doing to ascertain by a thorough inspection whether the ship concerned is in a seaworthy condition and is equipped in conformity with the laws and regulations in force.

It shall be incumbent on the ship control to see that the requirements relating to number and qualifications of crew are duly being complied with.³

The ship control is empowered to board Norwegian ships in order to inspect them. During these inspections the owner of the ship or his representative is required to render such assistance as the circumstances permit. The inspection may take place at any reasonable hours and may be extended to every part of the ship—to engines, boilers, boats, equipment, cargo, etc. When necessary to a thorough inspection, the ship control may even order the ship to be opened up,

the engines to be set going, the cargo discharged, and any other measures deemed by them necessary.

The law of September 18, 1909, concerning the supervision of seaworthiness of ships, which went into operation on October 1, 1910, contains the following additional regulations concerning the inspection of vessels:

All Norwegian ships propelled by engine power, carrying passengers in the coasting or the European trades or between Europe and the other continents shall be subject to survey and inspection. Steamships carrying a smaller number of passengers than one adult for every 25 tons gross register are exempted from this survey and inspection. This exemption does not, however, apply to steamers carrying more than 12 passengers in all. Steam or motor vessels not regularly employed in passenger trade, but which only occasionally carry passengers, shall not be subject to these regulations. Specific regulations concerning the control of these vessels shall be made by the King or by whomever he may authorize.¹

Applications for survey shall be made to the ship control by the master or owner and the same shall be held at the time and place most convenient for the ship.²

A complete survey must be made before a Norwegian passenger ship may proceed to sea for the first time, and shall be repeated once a year, as a rule. A complete or partial survey must also be made when the ship or any of its parts have been changed by damage, repair, or otherwise. This rule may be waived, however, in special cases by the King or by any one whom he may designate for the purpose.³

Special regulations as to the construction and building of passenger ships, their equipment, supervision, etc., shall be made by the King or by whomever he may authorize for the purpose (as mentioned above), and in pursuance of these regulations the ship control shall ascertain:⁴ (1) Whether the hull and appurtenances of the ship are in a sound and satisfactory condition for the intended trade; (2) whether the engines, boilers, and pipe connections are properly made, fitted, kept in repair, provided with the necessary controlling and safety appliances, and in full working order, and whether the engines are sufficiently strong and of substantial make; (3) whether the life-saving boats and appliances, lights, fog and distress signals, compasses and instruments, fire-extinguishing apparatus, protective arrangements on and below decks, and the rest of the equipment, are of such a kind and in such condition as required by the provisions in force.

The regulations mentioned in the preceding paragraph shall contain rules for calculating the number of passengers and provisions for their health, comfort, and safety. The space allowed for passengers shall vary for the various trades from 5.5 square feet deck space on short routes in sheltered waters to 8 square feet of free deck space per passenger in the coasting trade.⁵

Certificates are issued for passenger ships after inspection.⁶ These certificates show the largest number of passengers permitted and

¹ Law concerning the public supervision of the seaworthiness of ships, etc., dated June 9, 1903, with amendments of Sept. 18, 1909, sec. 94.

² Ibid., sec. 95.

other particulars of the kind, and must be posted in a conspicuous place on board the vessel.¹

This law does not apply to ships of the navy or ships employed in the service thereof.

FRANCE.

The present inspection regulations of France are chiefly contained in the ministerial instructions of May 17, 1909, relative to the application of the act of April 17, 1907, and of the regulations of September 20 and 21, 1908.² The act of April 17, 1907, is the latest legislation in France on the subject of security of navigation and the regulation of work on board ships (*Sécurité de la Navigation et Réglementation du Travail à bord des navires*).

The ministerial instructions issued May 17, 1909, are grouped in three main categories, as follows: (1) Inspection of new French-built and of recently acquired foreign-built ships; (2) periodical inspection of French-built ships already in operation; (3) inspection on leaving port.

The French law³ requires that every ship with a gross tonnage of more than 25 tons used for trade, fishing, or pleasure purposes and operated by means of sailing, steam, or other mechanical power shall have a "permis de navigation," a document corresponding closely to certificate of inspection in the United States and attesting the seaworthiness of the vessel.

This document is given French ships only after a thorough inspection, which includes: (1) Inspection of hull to determine whether all parts are of good construction and suitable for navigation; (2) inspection of boilers and engines; (3) inspection as to other requirements, (a) equipment, (b) hygienic condition of all quarters, (c) life-saving appliances, (d) ships stores, (e) nautical instruments and documents, (f) medical stores, (g) maximum number of passengers allowable, (h) load lines.

Newly built ships that have either a final or a provisional certificate showing a first-class rating by an approved classification society are exempted from the inspection required under article 1 of the act of April 17, 1907, and of article 62 of the regulations of September 21, 1908, with respect to hull, engines, and boilers with their appurtenances, i. e., from inspection as to matters covered by the inspection rules of those societies. This applies to ships built abroad as well as to those built in France.⁴

Such ships are, however, subject to inspection as to fitting out, habitability and cleanliness of quarters, life-saving equipment, maps and nautical instruments, medical stores, maximum number of passengers allowed, and load-line marks.⁴

An interesting provision under the regulations of May 17, 1909, is that any ship built in France or in the French colonies that is not constructed under the supervision of an approved classification society with the view to securing a first-class rating (*la première cote*) must before launching be inspected by the inspection commis-

¹ Law concerning the public supervision of the seaworthiness of ships, etc., dated June 9, 1903, with amendments of Sept. 18, 1909, sec. 100.

² Instruction Ministérielle du 17 mai, 1909, pour l'application de la loi du 17 avril 1907, et des Régléments

sion. This inspection includes an examination of the construction of the hull (water-tight compartments, double bottoms, cook rooms, and water tanks), and a hydrostatic test of the boilers (in conformity with art. 52 of the rules issued Sept. 21, 1908).

Another provision in the French regulations of May 17, 1909, is that either before the keel of a vessel is laid or during the process of construction the parties building the hull and the various other parts of the ship and its equipment may at any time request the advice of the commission in regard to general plans or any detail of construction or fitting out; and the commission is required to respond to any such request within 10 days. This provision is of much interest at the present time in view of the discussion as to advisability of requiring plans of ships built in the United States to be approved by a board of naval architects.

In cases of dispute between French officials and shipbuilders as to the character of construction of hull and boilers of a ship not built under the supervision of a classification society, the regulations of May 17, 1909, provide that the rules of the Bureau Veritas shall be the final interpretative authority.¹

The certificate of inspection given a newly built or newly acquired French ship is valid only until the next inspection. The certificate must be renewed periodically after the hull, equipment, and machinery and general conditions as to the safety and hygienic condition of the ship have been investigated in the regular way.²

In the interval between regular inspections the ship may be subjected to special inspections either on account of great damage to the ship or of extensive changes in the construction or equipment of the hull, engines, or boilers.²

The regular inspections of French ships are made at intervals that vary with the character of the trade in which the ship is engaged. Ships engaged in the overseas, international coasting, or deep-sea fishing trades, and propelled by mechanical power, must be inspected at the following intervals:³

One inspection each year of the hull, equipment, and machinery. This inspection must be made within the 12 months' period, except as provided in section 5, article 2, of the law of 1907.

An inspection of the hull in dry dock once every 18 months in the case of ships built of either steel or iron and once every 3 years for ships constructed of wood.

An inspection once in every two years of the propeller and screw shaft out of water.

Ships operating in other trades, especially ships in the national coasting trade or the local fishing trade, are not required to undergo inspections at regular intervals, but the inspection officials may require an examination in dry dock once in every four years if the ship is of steel or iron, and once every six years if the ship is constructed of wood.

The annual inspection and the examination in dry dock may be dispensed with whenever the conditions warrant it.³

Whatever the class of navigation in which the ship may be engaged the machinery must always be subjected to regular annual inspections at the time the hull is inspected, even if these appliances have been subjected to tests in the meantime.

The complete inspection of boilers and engines which is provided for in article 56 of the rule of September 21, 1908, and is much more extensive than the ordinary inspection, need not, however, coincide with the inspections of the hull.¹

Ships having a certificate of first-class rating from an approved classification society are exempted from examinations in dry dock in accordance with article 5, section 9, of the law of 1907, as well as from those portions of the regular examinations of boilers, engines, etc., which are covered by rules of the society.¹

The regular annual inspections and the examinations in dry dock can take place only in the ports of France or the French colonies which have been designated by decree.¹

The commission in charge of this inspection consists, in addition to the administrator of the marine registry and the navigation inspector, of at least two technical experts taken in rotation, so far as possible, from the general list of members chosen by the ministry from the following classes of persons: Officers of the marine, over-seas captains, engineer officers of the merchant marine, or engineers.¹

If at the time for the regular inspection a ship is in a port that does not have an inspection commission, the owner of the ship or his representative may request that the commission of the district in which the port is located shall proceed to that port to make the examination. The administrator of the marine register determines, however, whether the equipment of the port would permit of the proper examination. The additional expenses incurred on account of such an inspection must be borne by the owner of the ship.¹

Every ship that requires regular inspections in a particular port may have all or part of that inspection deferred, within time limits fixed by the commission until the vessel reaches another port.¹

The regular inspection of hulls, water-tight compartments, etc., of French ships already in commission is practically the same as that to which newly built ships are subjected.

In regard to inspections made before the departure of vessels from French ports it should be noted that they cover practically the same ground as mentioned in the preceding sections and are in fact supplementary thereto.¹

Article 7 of the law of April 17, 1907, requires that the navigation inspectors shall visit every French or foreign ship before its departure from the ports of France, Algeria, or the French colonies. This provision applies to all over-sea ships or ships in the national or international coasting trade, as well as to ships engaged in deep-sea fishing. Section 59 of the ministerial instructions of May 17, 1909, provides, however, that this inspection may not take place more than once a month in the case of ships making more frequent voyages, except in the case of ships carrying emigrants.

These inspections cover practically all of the points referred to in the preceding sections, but the instructions are to the effect that

the navigation inspectors need not make a detailed and thorough examination every time the ship leaves port, but shall take up in detail on each inspection only a few of the main requirements.¹

The rules regarding the construction and inspection of steam engines and boilers on French vessels. These rules are to be found in articles 33 to 65 of the regulations of September 21, 1908, and to all appearances are quite as exacting as the requirements of the other leading maritime countries.

The regulations regarding boiler tests are to be found in articles 55 to 63, and provide that the annual inspection shall include an inspection of the interior and exterior parts of the engines and principal and auxiliary boilers. The engines are submitted to a more thorough test, however, only once in every four years.

All boilers are subjected to hydrostatic tests. The hydrostatic pressure applied is one and one-half times the allowable working steam pressure of the boilers and is never less than one-half a kilogram nor more than 6 kilograms per square centimeter (7.10 and 85.2 pounds per square inch, respectively). The test is long enough to make possible a thorough examination, but in general it is between 5 and 10 minutes. After the hydraulic test the boiler is opened in such a manner that it can be examined in all its parts.

Boilers are subjected to a complete test: (a) When new; (b) when they have undergone extensive repairs; (c) when they are put into service after the expiration of their former certificate of inspection; and (d) once every 4 years up to 12 years, and thereafter once every 2 years.

JAPAN.

Article 1 of the ship inspection law of April 7, 1896, requires that inspection shall be made of all Japanese vessels except the following: (1) Sailing vessels of less than 20 tons gross register; (2) boats or vessels of any kind propelled wholly or principally by oars; and (3) sailing vessels operating exclusively on smooth-water routes.

As to the frequency of inspection, article 3 of the law of April 7, 1896, provides that a vessel shall be inspected: (1) When she is employed for the first time as a Japanese vessel; (2) when her certificate of inspection has expired; and (3) on special occasions requiring inspection.

In this connection it should be noted that certificates of inspection hold good for a period of from three months to one year in the case of steamships and for a period of from six months to three years in the case of sailing vessels.

Detailed regulations relating to the enforcement of the shipping inspection law of April, 1896, were issued in December, 1900, in notifications No. 87 and No. 88 of the Department of Communications.

These requirements provide for four kinds of inspection: (1) Special inspection; (2) periodical inspection; (3) contingent inspection; (4) emigrant-ship inspection.

The special inspection, which is made generally in the case of newly built or newly acquired ships, relates wholly to the construction and condition of the hull and equipment of the vessel.

The subjects covered in the periodical inspections are construction and condition of the hull and equipment, including a test of the manner in which bulkhead doors are closed and opened, and of the various equipments required under the law. The periodical inspection also includes a thorough test of the boilers, engines, other machinery, and appliances.

In regard to boiler tests, it is provided that in special inspections they shall be tested by the following hydrostatic pressures: (1) For a new cylindrical boiler the test pressure shall be 90 pounds greater than the maximum working pressure when the latter is not less than 90 pounds, and twice the maximum working pressure when the same is under 90 pounds; (2) for an old cylindrical boiler the test pressure shall be 45 pounds greater than the maximum working pressure when the latter is not less than 90 pounds, and one and one-half times the maximum working pressure when the same is under 90 pounds; (3) in the case of new water-tube boilers the test pressure shall be 15 pounds above one and one-half times the maximum working pressure; and in the case of old water-tube boilers the test pressure shall be 15 pounds above one and one-fourth times the maximum working pressure.

At the regular or periodical inspections the boilers are subjected to the hydrostatic test specified above only when the inspector deems it necessary. An inspection is required, however, whenever the greater portion of the boiler already in use is renewed.

5. LOADING OF VESSELS.

INTRODUCTORY.

The subject of loading of vessels is closely connected with the name of Samuel Plimsoll, who, as a member of the British Parliament, conducted in the early seventies of the last century a strong campaign for the fixing of load lines on vessels under the British flag. In Plimsoll's opinion the unusual number of disasters at sea that had been occurring for years were due chiefly to the overloading of vessels, and he contended that Parliament should establish a load line for every vessel.

A royal commission, appointed to investigate the question, reported to Parliament in 1874 that the establishment of load lines could not be successfully accomplished by law, since no rule of universal application could be applied without injury to British shipping.

Parliament, however, did not accept the recommendations of this commission and passed an act known as the merchant shipping act of 1876, which provided that a circular disk, with a line drawn through the center, should be painted amidships on both sides of every British vessel, except those under 80 tons register engaged in the coasting trade. This mark, which came to be known as Plimsoll mark, was to indicate the greatest draft to which vessels should be loaded. The fixing of the load line was in the first instance determined by the shipowner, but it was the duty of the Board of Trade to see that no overloaded vessel cleared from any British port.

This indefinite method of procedure led to many disputes which were, in the course of time, settled by the general acceptance by the Board of Trade and shipowners of load-line marks fixed according to the reserve buoyancy tables of Lloyd's Register. This society published in 1882 reserve buoyancy tables for the use of those desiring to determine load lines for their vessels; and, while these tables were not enforceable at law, they had behind them an institution whose influence among the shipping community was very powerful and whose tests could not lightly be disregarded.¹

No further action was taken in regard to this subject until 1890, when it was decided that the matter of load lines should be placed upon a more definite and scientific basis. Accordingly, in that year the load-lines act was passed. This act provided that the load lines should be marked in accordance with regulations provided by the Board of Trade, and that the position of the disk should conform with the tables fixed by the load-line committee. This act was reproduced in the merchant shipping act of 1894, sections 437 to 443, and provision was made for its modification by the Board of Trade without reference to Parliament.

At the outset the requirements as to load lines were applicable only to British vessels. The exemption of foreign vessels operating in competition with British-owned vessels subject to the act was strongly objected to, but it was not until the passage of the merchant shipping act of 1906 that any change was made in the statutory requirements.

Section 1 of part 1 of the act of 1906 provides that the load-line provisions of the act of 1894 shall apply with equal force to foreign ships while in ports of the United Kingdom and to British ships. It was provided, however, that exemptions could be made in favor of ships of countries having regulations in force relating to overloading and improper loading that are equally effective with the provisions of the British act.

The manner in which the load-line marks are placed on a vessel is of interest. Section 437 of the merchant shipping act of 1894 provides that the load-line mark shall consist of a circular disk 12 inches in diameter, with a horizontal line 18 inches in length drawn through its center and that it shall be in white or yellow on a dark ground or in black on a light ground. This disk is to be painted on each side of the vessel amidships or as near thereto as is practicable.

The center of the disk is placed at such level as may be approved by the Board of Trade and indicates the maximum load line in salt water to which it is lawful to load the ship.

In addition to the disk which is required under section 438 of the act of 1894, and which relates only to the load line in salt water, the Board of Trade places other marks which indicate the maximum load line in fresh water, in different seasons of the year, and on special routes. The forms in which these marks are applied are shown in the accompanying illustration taken from the Board of Trade regulations of January 12, 1899.

A number of countries have followed the lead of Great Britain in fixing load lines, as is indicated in the following extract from the Shipping World Yearbook for 1915 (p. 67):

Under provisions of the Merchant Shipping Act, 1906, which came into force on October 1, 1909, the British load-line regulations now apply to all foreign ships while they are within any port in the United Kingdom.

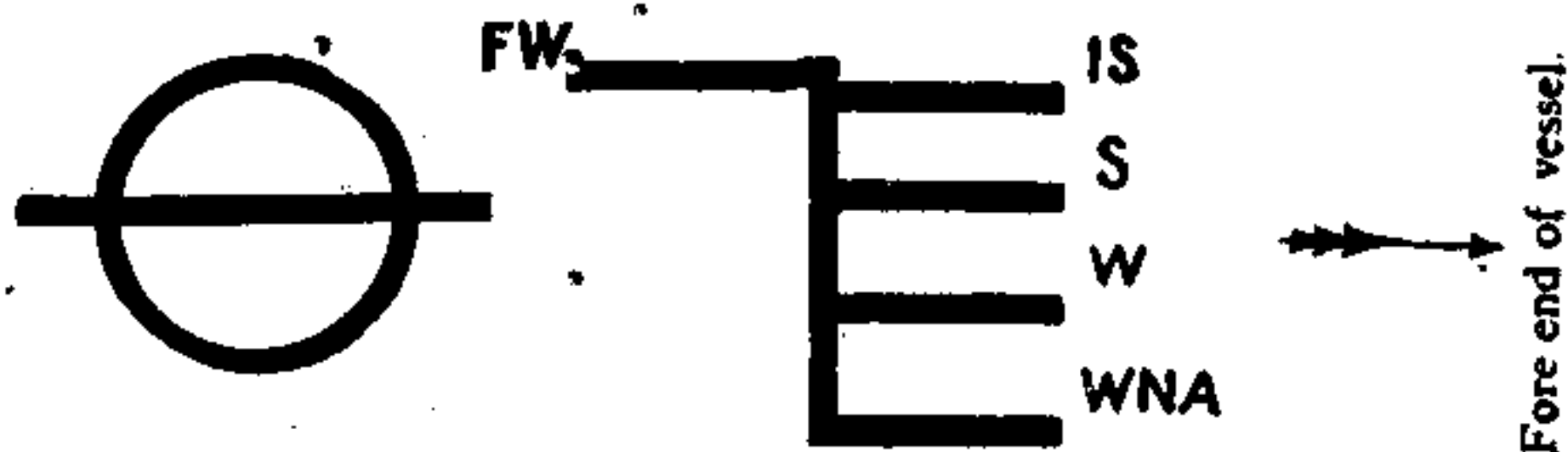
The load lines fixed and marked and the certificates of freeboard issued by the Governments of India, the Straits Settlements, Victoria, and South Australia, are to

PLIMSOLL'S MARK

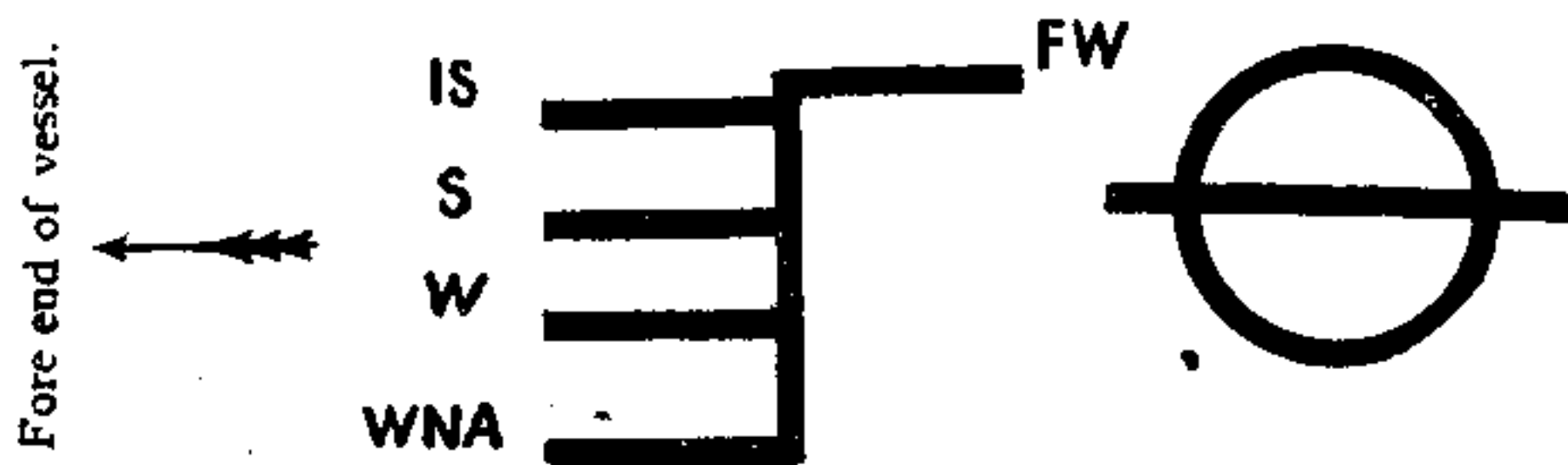
FROM BOARD OF TRADE REGULATIONS
DATED JANUARY 12TH, 1899.

1. STEAMSHIPS.

Starboard Side.



Port Side.



2. SAILING SHIPS.

Starboard Side.



Port Side.



F.W.—Fresh water
I.S.—Indian summer

S.—Summer.
W.—Winter

W.N.A.—Winter, North Atlantic.

have the same effect as if they had been fixed, marked, and issued by the British Board of Trade.

Austria, Denmark, and Spain have adopted the British tables and rules and vessels flying the flags of these countries are now required to have load lines assigned and marked in accordance therewith. Norway has adopted freeboard tables and regulations which are now in operation under the Norwegian law and are in certain cases accepted by the British Board of Trade, but which, as regards steamers, are not in agreement with the British tables and are not recognized by the British Government. In most cases, if not in all, acceptance of the British tables and rules by foreign governments is qualified by reservations in detail.

UNITED STATES.

The navigation laws and regulations of the United States at present contain no reference to the marking of load lines. The principal safeguard against overloading of vessels in ports of the United States is to be found in section 11 of the act of December 21, 1898, relating to unseaworthy vessels.

The subject of load lines is discussed in the latest annual report of the Commissioner of Navigation in the following terms:

The addition of a considerable number of ocean-going bulk-cargo steamers to our merchant fleet renders desirable the enactment of a law upon the subject of load lines. The second section of the act of February 21, 1891, provided: "The owner, agent, or master of every inspected sea-going steam or sail vessel shall indicate the draft of water at which he shall deem his vessel safe to be loaded for the trade she is engaged in, which limit as indicated shall be stated in the vessel's certificate of inspection, and it shall be unlawful for such vessel to be loaded deeper than stated in said certificate."

While it was not the intention, the effect of this act was to place at a commercial disadvantage more scrupulous owners as compared with owners disposed to load their ships up to the margin of safety and possibly in some instances beyond that margin, and mark their ships accordingly. The law was, therefore, repealed by the act approved January 20, 1897.

GREAT BRITAIN.

The British laws and regulations regarding the marking of load lines have necessarily been discussed in detail in the introductory statement, for Great Britain was the first country to enact legislation on this subject and has been foremost in its requirements.

It might here be added that the present rules relating to freeboard are contained in the tables of freeboard, as revised by the Board of Trade in 1906, 1907, and 1909, with rules and instructions for applying the tables to the various types of steam and sailing vessels.

GERMANY.

The fixing of load-line marks on German vessels has been left to the See-Berufsgenossenschaft. Before drafting its rules this organization made an exhaustive study of the subject of loading and of proper amount of freeboard, collecting a vast amount of statistical data relative to the depth of German ships when fully and when partially loaded.

The rules, which were formulated in collaboration with the Germanischer Lloyd, were first issued in 1903 as Supplement I of the Accident Prevention Rules of the Association for Steamships, and applied to both steamships and sailing vessels engaged in over-seas voyages (*lange und Atlantische Fahrt*) and those making long coasting voyages (*grosse Küstenfahrt*). A later edition of the rules ap-

peared in 1909 as Supplement III of the rules for steamships and as Supplement I of the rules for sailing vessels.

The load-line marks of German vessels are accepted by the British Board of Trade.

NORWAY.

Every ship, except fishing, seal, and whaling vessels, those of less than 100 tons gross register,¹ and those trading coastwise in Norway, is required by law to have a horizontal line amidships on both sides, indicating the deck from which the freeboard is to be measured.² The law states that "the ship shall be provided with a mark, denoting the deepest line (the load line) to which the ship may legally be loaded down in salt water."² Besides the principal mark, other marks or lines are required to be affixed denoting the wood-cargo line, load lines in different seasons and under different conditions of trade, kind of cargo, etc.

The measuring of the position of the lines and the application of them are executed by persons specially authorized for that purpose by the ministry in charge. This authorization may be conferred upon the Norske Veritas or upon any other classification society recognized by the King of Norway. The computations must be submitted to the Mercantile Marine Department for the purpose of verification, and this department may reject the assignment made and require the position of the lines altered.²

With reference to load lines determined and affixed under regulations of foreign countries, the following provision of the act of June 9, 1903, applies:

The King, or any person on whom he may confer authority for the purpose, may, on request being made to that effect, approve of a load line affixed in accordance with foreign load-line regulations, which by Norwegian authorities have been recognized as equivalent to Norwegian ones.²

A royal ordinance dated October 6, 1909, recognizes the British Board of Trade rules and tables of freeboard as equivalent to the Norwegian rules as established in 1909.

If a ship has been loaded so deep that the upper edge of the load line applying to the particular cargo under existing conditions is submerged, the vessel is considered unseaworthy, and the ship control may detain it in a Norwegian port until a sufficient part of the cargo has been discharged to permit the line to reappear above the water.

FRANCE.

Rules and regulations relating to the marking of load lines on French vessels are contained in a decree of September 21, 1908, approving the regulations prepared by the Bureau Veritas.

The Ministers of Marine and of Commerce and Industry are required by paragraph 7 of section 53 of the law of April 17, 1907, to make general rules for the determination of the maximum draft to which vessels may be loaded and for placing load-line marks indicating this maximum upon the hulls of vessels. This section also

¹ Royal ordinance of Apr. 15, 1910, provides that the provisions of the law relating to load lines shall also be applicable to ships of a tonnage not exceeding 100 tons and not less than 25 tons gross register engaged

provides that in the determination of these rules the Minister of the Marine should be assisted by an approved classification society. Accordingly, the Bureau Veritas was directed to prepare the rules which were formally adopted by the Minister of the Marine and issued in the decree of September 21, 1908.¹ These rules are very technical and detailed in their requirements and, so far as can be determined, conform with the standard of the rules fixed by the British Board of Trade.

JAPAN.

There is, apparently, no law or regulation in Japan relative to the marking of load lines on vessels.

6. TONNAGE DUES.

Tonnage taxes are intimately connected with measurement of vessels and are levied by practically all countries. In addition, certain countries require the payment of light and beacon dues, town dues, chamber of commerce dues, or sanitary dues. As used in this connection, the term "tonnage taxes" indicates a general charge or tax on shipping, which is usually small, and not a charge for the use of port facilities, although the latter is also based on vessel tonnage.

UNITED STATES.

Tonnage tax is levied on every vessel engaged in trade upon her arrival by sea from a foreign port, unless she is in distress, at the rate of 2 or 6 cents for each net ton. On all vessels which enter any port of the United States from any foreign port or place in North America, Central America, the West India Islands, the Bahama Islands, the Bermuda Islands, or the coast of South America bordering on the Caribbean Sea, or Newfoundland, a tonnage duty of 2 cents per ton is imposed on each entry. On all vessels which enter in any port of the United States from any other foreign port a tonnage tax of 6 cents per ton is imposed at each entry.² It is not levied on more than five entries at the same rate during any one year, the tonnage year beginning with the date of the first payment and ending on the day preceding the corresponding day on the following year.³ "The rates for tonnage duties now imposed in the United States are substantially similar to the rates for the corresponding light dues imposed in the United Kingdom and are materially lower than corresponding charges imposed in the ports of the continent of Europe and elsewhere. They are imposed without discrimination and are on a revenue basis and were not changed by the tariff act of October 3, 1913."⁴

Various exemptions are made in the payment of this tonnage tax. For example, no vessel belonging to any citizen of the United States trading from one port within the United States to another port within the United States, or employed in the bank, whale, or other fisheries, is subject to tonnage tax or duty if such vessel is licensed,

¹ Journal Officiel du 9 octobre, 1908.

² Rev. Stat., 4227, as amended by sec. 36 of the act of Aug. 5, 1909.

registered, or enrolled. Likewise, no tonnage or clearance fees are charged against any vessel making regular daily trips between any port of the United States and any port of Canada, wholly upon internal waters not navigable to the ocean, except upon the first clearing of such vessel in each year.¹ By the act of March 8, 1910; vessels entering otherwise than by sea from foreign ports at which no tonnage or light dues or equivalent taxes are imposed on vessels of the United States were exempted from tonnage taxes in the United States. This act in effect applies to American and Canadian vessels in trade on the Lakes between the United States and the Province of Ontario where they are in competition to a considerable extent with the railroads.²

In exceptional cases, such as a vessel that is owned by citizens of the United States but is not a vessel of the United States, there had been imposed an alien tonnage tax of 50 cents per ton and light money of 50 cents per ton upon entry into a United States port.³ The act of March 4, 1915, however, repealed these provisions and specified that any tonnage duties, light money, or discriminating duties collected since the passage of the act of August 18, 1914, should be refunded, with the understanding that every such vessel after entering an American port must become registered as a vessel of the United States before leaving same.

GREAT BRITAIN.

The British law provides for the collection of light dues from all shipping frequenting the ports of the United Kingdom. The merchant shipping act of 1898 changed the former practice of requiring the payment of light dues from ships which passed a certain lighthouse or which derived benefits from this lighthouse to the practice of levying light dues with respect to each voyage made by ships or by way of periodical payment. The scale of payment for light dues is as follows:⁴

Class of trade and ship.	Rate per net ton per voyage.	Maximum number of voyages charged for annually.
Home-trade sailing vessel.....	\$0.020	10
Home-trade steamship.....	.030	6
Foreign-trade sailing vessel.....	.046	10
Foreign-trade steamship.....	.056	6

In the case of tugs and pleasure yachts a flat annual rate of a shilling (\$0.243) per ton is charged.

Merchant ships making in the course of a year both home-trade and foreign-going voyages are charged for not more than 10 voyages, foreign-going voyages in this case counting as a voyage and a half.

The voyages of a home-trade ship are reckoned from port to port, but a home-trade ship is not required to pay dues for more than three voyages in one month.

¹ Rev. Stat., 4221.

² Report of Commissioner of Navigation, 1910, p. 17.

³ Rev. Stat., 4219 and 4225.

⁴ The Shipping World Yearbook, 1915, p. 144.

. . Dues payable per voyage are collected only at ports where a ship loads or discharges passengers, mails, or cargo.

The following classes of vessels are exempted from payment of light dues: (1) Ships belonging to the British and foreign Governments; (2) sailing vessels (other than pleasure yachts) of less than 100 tons; (3) all ships (other than pleasure yachts) of less than 20 tons; (4) vessels (other than tugs and pleasure yachts) when operated wholly in ballast and carrying no passengers; (5) vessels putting in for bunker coal, stores, or provisions for their own use on board; (6) vessels putting in from stress of weather, or for repairs, or because of damage, provided they do not discharge or load cargo other than cargo discharged with a view to repairs and afterwards reshipped; (7) vessels for the time being employed in sea fishing or in sea-fishing service, exclusive of ships used for catching fish otherwise than for profit; (8) yachts and pleasure craft of less than 5 tons register.

A number of reductions in light dues have been made by orders in council issued in accordance with Section V, article 2, of the act of 1898. On April 1, 1903, a reduction of $12\frac{1}{2}$ per cent took effect; on April 1, 1907, an additional reduction of $7\frac{1}{2}$ per cent limited to three years; on April 1, 1909, an additional reduction of $17\frac{1}{2}$ per cent, also limited to a period of three years. The reduction of $7\frac{1}{2}$ per cent made in 1907 has been repealed.¹

GERMANY.

Tonnage and light dues are not regulated by imperial statutes in Germany, but are left to the discretion of the several States. In some cases the regular pilotage dues include beacon and light dues, in other cases town dues take the place of tonnage dues, and some ports require the payment of neither tonnage nor light dues. There is given below a list of some representative ports of Germany with their respective requirements in this connection:²

Bremerhaven.—Light and beacon dues: 6.7 cents per net register ton for sailing vessels and 9.4 cents per ton for steamships, for each ton above 70 tons. Vessels entering the river empty or in ballast and without passengers are refunded half of the light and beacon dues paid if they leave again empty or in ballast and without passengers. Vessels that enter the river on account of damage, accident, ice, gales, or bad weather, and leave again without discharging or loading any cargo, are not required to pay light and beacon dues. Pilot boats and tugs are also exempt from these dues.

Bremen.—Light and beacon dues are the same as at Bremerhaven.

Cuxhaven.—Light dues: Pilotage dues include beacon and light dues at this port.

Hamburg.—Apparently no light and beacon or town dues are assessed at the port of Hamburg. Tonnage dues are levied upon shipping but these are believed to be charges for the use of the facilities of the port and therefore not comparable with tonnage taxes as levied in the United States.

Konigsberg.—Town dues at the rate of 2 cents per register ton are levied on vessels of more than 70 tons register and 1 cent per register

ton on vessels of smaller size for every entrance and clearance. Vessels of more than 70 register tons coming from German ports, including those of the Rhine, without calling at a foreign port, are exempt from town dues. Vessels which visit the harbor of Königsberg at least ten times in the course of one year (Apr. 1 to Mar. 31) and have paid town dues receive a refund of one-third at the end of the year.

NORWAY.

Apparently no taxes similar to the tonnage taxes that are levied by the United States are assessed on shipping in Norwegian ports. Light dues which might be regarded as an equivalent of the United States tonnage tax are levied, but these appear to be grouped with tonnage dues and are not separately stated. From details given in Urquhart's *Dues and Charges on Shipping in Foreign and Colonial Ports* (1914 edition) it would seem that tonnage and lighthouse dues are charged for the use of port facilities and not as a general tax on shipping.

FRANCE.

The French tax and tariff law of April 28, 1816, imposed differential tonnage dues on foreign shipping entering French ports. The law of May 19, 1866, however, abolished tonnage dues and at the present time there are no definite national tonnage taxes levied under the French laws, each port making its own requirements in this respect.

As a general thing, French tonnage dues accrue to the benefit of cities or chambers of commerce for the reimbursement of expenses incurred by them in such port improvements as dredging, dock construction, installation of loading and unloading apparatus, etc., and should be regarded as charges for the use of the facilities of the port, similar to wharfage and dockage charges in ports of the United States.

Only a few French ports require the payment of light dues, but the French maritime laws impose so-called sanitary dues on all vessels, both national and foreign. Light dues and sanitary dues may be regarded as charges similar to tonnage taxes levied by the United States. The sanitary tax is 5 centimes (\$0.0097) per net register ton for vessels in the French coastwise trade, and 10 centimes (\$0.0193) per net register ton for vessels in the international coastwise trade of France, while vessels from all other ports are required to pay 15 centimes (\$0.029) per net register ton. Town dues and chamber of commerce dues are levied in addition in some ports.

JAPAN.

Japanese tonnage dues are levied on all vessels engaged in the foreign trade which enter an open Japanese port. The amount to be paid at each entry is 5 sen (2½ cents gold) per registered ton or for every 10 koku (about 40 bushels) of the registered capacity (in the case of a Japanese rigged vessel). If the payment is made at once, however, at the higher rate of 15 sen (7½ cents gold) per registered ton or for every 10 koku of the registered tonnage, no further tonnage dues are required to be paid at that port until a full year from that date. Vessels entering a Japanese port in distress or under unavoidable circumstances are not required to pay tonnage dues.¹

Chapter II.—LAWS AFFECTING OFFICERS AND CREW.

1. NATIONALITY OF OFFICERS.

UNITED STATES.

All officers of vessels of the United States who are in charge of a watch, including pilots, are required under section 4131 of the Revised Statutes to be citizens of the United States. This has been the rule for American vessels since the act of December 31, 1792, but this requirement was made more explicit by section 1 of the act of May 28, 1896, which specifies that no person may be an officer unless he is a native-born citizen or has his final naturalization papers.

The word "officer" is defined in section 1 of the act of May 28, 1896, as including the chief engineer and each assistant engineer in charge of a watch on steam vessels.

The ship-registry act of August 18, 1914, authorized the President to exempt, so far and for such length of time as he might deem desirable, foreign-built ships admitted to American registry under that act from the requirements as to the citizenship of their officers. Accordingly, in an Executive order of September 4, 1914, it was provided that such ships might retain all of their watch officers without regard to citizenship for a term of seven years; provided, however, that after a period of two years any vacancy should be filled by a citizen of the United States.

GREAT BRITAIN.

In general, there are no requirements as to the nationality of officers in the British merchant marine. It is interesting, however, to note that the agreement of July 30, 1903, between the British Government and the Cunard Steamship Co. relative to special admiralty and postal subventions to the latter provided in paragraph 9 of part I as follows:

(1) That on all vessels belonging to the company, including the two new steamers (*Lusitania* and *Mauretania*) to be built under that agreement, the master, officers, and the engineers in charge of a watch should always be British subjects; and that three-fourths of the crew should be British subjects, unless, in the case of the crew, the company is prevented from fulfilling this obligation owing to strikes, lockouts, or other labor disturbances.

(2) That on the two steamers (*Lusitania* and *Mauretania*) to be built under the agreement, all of the certificated officers other than engineers and at least one-half of the crew (except in the case of strikes, etc.) should belong to the Royal Naval Reserve or the Royal Naval Fleet Reserve.

GERMANY.

The laws of Germany contain no requirement that the officers of vessels shall be German citizens. The examinations for officers' commissions, however, are all set in the German language, and this has the effect in general of discouraging the employment of persons of

FRANCE.

The French law of September 21, 1793, which is still in force, stipulates that the master and all the officers of French vessels shall be citizens of France.

NORWAY.

The Norwegian law of August 13, 1857, which is still in force, prescribes that foreigners may be masters and mates after having first obtained certificates in the Norwegian schools.

A letter from the Norwegian Home Office, dated March 5, 1900, states that the right to serve as master, mate, or engineer in a Norwegian ship depends upon the party having attained a certain age, having been practically trained in a certain manner during a certain number of years, and having passed a certain examination. This examination must be passed at a Norwegian navigation or engineering school. If foreign citizens have passed the examination required in the Norwegian Kingdom and possess the other qualifications necessary to obtain a Norwegian certificate as master, mate, or engineer, nothing can prevent them from obtaining such a certificate and, subsequently, the right to serve in Norwegian vessels on an equal footing with Norwegian subjects of corresponding positions.

In order to carry on the profession of shipmaster, it is moreover required of foreign as well as of Norwegian subjects that they obtain the right of citizenship, and, in respect to foreigners, it is also necessary that they produce evidence of blameless conduct and that they are domiciled in the Norwegian Kingdom.

JAPAN.

The Japanese law of April, 1896, specifies that all those persons who are legally qualified according to the Japanese law may be officers of ships of European design flying the Japanese flag without regard to their nationality. The word "officer" comprises captains, first and second mates, chief and first engineers, all of whom are required to possess the proper license to be qualified for their respective services.

Article 9 of the ocean lines subsidy law of March 25, 1909, provides that no foreigners may be employed as officers of the vessels of subsidized companies without the consent of the Minister of Communications.

2. NATIONALITY OF CREW.

UNITED STATES.

In general, there are no requirements as to nationality of the crew on vessels of the United States. Steamers employed in mail service under the provisions of the ocean mail act of 1891, however, are required during the first two years of operation under their contracts to have one-fourth of their crews citizens of the United States; during

GREAT BRITAIN.

There are no general requirements as to the nationality of crews carried on vessels in the British merchant marine, but the Cunard Steamship Co., under its agreement of July 30, 1903, with the British Government, is required to have three-fourths of the crews on all of its vessels British subjects, unless it "is prevented from fulfilling this obligation owing to strikes, lockouts, or other labor disturbances."

GERMANY.

No regulations prohibiting the employment of foreigners on German vessels are found in the laws of Germany.

NORWAY.

The laws of Norway make no special requirements as to nationality, except as to the proportion of foreigners that may be carried on Norwegian vessels. The law of August 26, 1854, provides that only a certain proportion of foreigners may be shipped for service on board Norwegian vessels and foreign subjects may not, except in cases of emergency, be shipped to serve as sailors or stokers in any number exceeding the prescribed proportion. It is, however, lawful to ship Swedes for service in Norwegian vessels without any limitation as to numbers.

The proportions of foreign citizens in crews of Norwegian vessels, as fixed in article 1 of the Norwegian law of August 26, 1854, are as follows:

All hands.	Foreigners.
3	1
4-6	2
7-9	3
10-12	4
13-15	5
16-18	6

And so on in the same proportion.

FRANCE.

Article 2 of the law of September 21, 1793, stipulates that three-fourths of the crew on vessels under the French flag must be French citizens.

This provision was found to be particularly burdensome to French vessels operating in the Far East, especially in the Indian Ocean and the China Sea. English and German ships trading within those limits employed crews made up almost exclusively of Hindus or Negroes, who not only endured the climate much better than Europeans but were paid wages very much below those demanded by Europeans. Repeated complaints on this score caused an agreement to be reached by the Ministers of Marine, Foreign Affairs, and Finance in 1865 with the result that French vessels operating in distant waters

personnel of the crew. The only condition required of them was that they be furnished with annual navigation permits granted by the colonial authorities or by the consul at their home port.

Article 2 of the law of September 21, 1793, was further modified by article 27 of the law of April 7, 1902, so as to provide that the crews of vessels operating in the international coasting trade with any of the French colonies (cabotage international colonial) and never touching continental France, might be made up of foreign seamen of any proportion desired. In general, though, the provision requiring at least three-fourths of the crew to be French citizens holds good.¹

JAPAN.

There are no general restrictions against the employment of foreigners on Japanese vessels, but article 9 of the ocean lines subsidy law of January, 1910, provides that no foreigners may be employed as sailors on vessels of subsidized lines without the consent of the Minister of Communications. Japan has an excellent system of nautical training for both officers and sailors; and the number of Japanese sailors as well as officers is rapidly increasing, partly as a result of this fact.

3. NUMBER OF OFFICERS.

UNITED STATES.

The number of officers required on United States vessels is determined by the local inspectors of the Steamboat-Inspection Service at the time the vessel is inspected, and must be sufficient in the judgment of the inspector to make the vessel safe for navigation.² The discretion of the local inspectors is limited, however, by the proviso that every vessel propelled by machinery of 1,000 gross tons and over must carry at least three licensed mates who serve in three watches, unless the vessel is engaged in a voyage of less than 400 miles, in which case only two licensed mates are necessary, whereas vessels propelled by machinery of 100 but less than 200 gross tons require only one licensed mate unless the voyage be over 24 hours' duration, when two licensed mates are required.³

GREAT BRITAIN.

Every British foreign-going ship and every British home-trade passenger ship, as well as every foreign steamship carrying passengers between places in the United Kingdom, must be provided in all cases with a master duly certified as competent by the Board of Trade or equivalent colonial authorities.

The following additional officers are required:

1. If a ship is of 100 tons net register or upward, at least one officer besides the master holding a certificate not lower than that of only mate in the case of a foreign-going ship, or of mate in the case of a home-trade passenger ship.

¹ Report of British Board of Trade committee on the merchant marine (1903), Pt. III, Appendix A, No. 8.

2. If the ship is a foreign-going ship and carries more than one mate, at least the first and second mates must be duly certificated.

3. If the ship is a foreign-going steamship of 100 nominal horsepower or upward, there must be carried at least two engineers, one of whom is a first-class and the other a first-class or a second-class engineer duly certificated.

4. If the ship is a foreign-going steamship of less than 100 nominal horsepower, or a seagoing home-trade passenger steamship, there must be carried at least one engineer who is a first-class or second-class engineer duly certificated.¹

Foreign-going ships include every ship employed in trading or going between some place or places in the United Kingdom, and some place or places situated beyond the coasts of the United Kingdom, the Channel Islands, and the Isle of Man, and the Continent of Europe between the rivers Elbe and Brest, inclusive, while the designation "home-trade ships" include every ship employed in trading or going within the following limits: The United Kingdom, the Channel Isles, The Isle of Man, and the Continent of Europe between the River Elbe and Brest, inclusive.

The certificates, designated as "certificates of competency" provided for under the above requirements are as follows:

- A. Foreign-going ships: (1) Master, (2) first mate, (3) second mate, (4) only mate.
- B. Home-trade passenger ships: (1) Master, (2) mate.
- C. All steamships, whether foreign-going or home-trade: (1) First-class engineer, (2) second-class engineer.

GERMANY.

The navigation laws of Germany specify five different types of voyages for which regulations concerning the number and qualifications of ships' officers are laid down. A decree issued by the Imperial Chancellor June 16, 1903,² under the authority of the Federal Council, classified vessels according to the character of their voyage into five kinds, namely, *Nahfahrt*, *Küstenfahrt*, *kleine Fahrt*, *mittlere Fahrt*, and *grosse Fahrt*.

"*Nahfahrt*" is the term applied to voyages on bays, sounds, and estuaries as well as to ocean voyages not exceeding 24 hours or a distance of 50 nautical miles from the beginning of ocean navigation.

"*Küstenfahrt*," or coastwise trade, includes (1) voyages between places on the mainland and adjacent islands between Antwerp and Windau, including Helgoland but not the district north of the Agger Canal and Frederickshaven and the circuit (*umfahrt*) around Skagen, (2) voyages off the coast of the Danish islands situated to the south of Cattegat, including the island of Bornholm, and (3) voyages off the Swedish coast from Lysekil to Kalmar, including the island of Oland.

"*Kleine Fahrt*" includes voyages in the Baltic, in the North Sea as far as 61° north latitude, and in the English Channel.

"*Mittlere Fahrt*" comprises voyages between European ports, non-European ports of the Mediterranean and the Black Sea, ports on the west coast of Africa north of 12° north latitude, and ports in the Cape Verde or Canary Islands as far as Madeira.

¹ Merchant shipping act of 1894, sec. 92.

² Reichs-Gesetzblatt, p. 247.

"Grosse Fahrt" comprises voyages beyond the limits defined in the "mittlere Fahrt."

Vessels of more than 400 cubic meters gross measurement (about 140 register tons) engaged in the Küstenfahrt are required to carry one mate, but seagoing barges and tugs of from 400 to 1,000 cubic meters gross measurement (140 to 350 register tons) are not required to carry any. All steamships of this classification that do not carry passengers must have one engineer of class 4, while those carrying passengers must have an engineer of class 3, but if the voyage continues for an unbroken period of 16 hours, another engineer of class 4 is required in each case.

Vessels engaged in the "kleine Fahrt" of 400 cubic meters gross measurement (140 register tons) and over are required to carry a mate. Steamships in this trade not carrying passengers must have an engineer of class 3 in charge and at least one engineer of class 4, while those carrying passengers must have one engineer of class 2 in charge and at least one engineer of class 3. All sailing vessels in this trade with auxiliary motor power must carry one engineer of class 4.

Vessels engaged in the "mittlere Fahrt" are required to carry one mate if the vessel is from 250 to 3,000 cubic meters gross measurement (88 to 1,060 register tons), and two mates if of 3,000 or more cubic meters gross measurement. Steamships in this trade must also carry one chief engineer of class 2 and one engineer of class 3, while sailing vessels with auxiliary motor power must carry one engineer of class 3.

Vessels engaged in the "grosse Fahrt" are required to carry one mate if they are of more than 250 cubic meters (about 88 register tons) but less than 2,000 cubic meters gross measurement (about 700 register tons), and two mates if of 2,000 cubic meters or more. Steam vessels in this trade must also carry one chief engineer of class 1 and at least two engineers of class 2. However, if the vessel carries more than 50 passengers, or if its boilers have a heating surface (Heizfläche) of more than 2,000 square meters (21,528 square feet), or if the vessel has a gross measurement of more than 25,000 cubic meters (about 8,830 gross tons), it must carry one chief engineer and at least three engineers of class 1.

Steamships in the East Asiatic trade between 11 degrees south and 55 degrees north latitude and between 90 degrees and 150 degrees east longitude, as well as steamships in the coasting trade of East Africa and West Africa, must carry at least two engineers of class 2. Sailing ships in this trade equipped with auxiliary motor power must carry one engineer of class 2.

If it is known at the outset of a voyage that it will continue uninterruptedly for a period of more than 16 hours, another engineer of class 3 must be carried on each vessel in this trade.

The above regulations apply only to vessels propelled by steam power and do not apply to pleasure boats or to vessels engaged in fishing on the high seas. They contain a provision that exceptions thereto may be made by the imperial chancellor acting in conjunc-

NORWAY.

The laws of Norway contain no requirement as to the number of officers to be carried on vessels under the Norwegian flag.

FRANCE.

Before taking up the matter of the number and the qualifications of French officers, certain peculiarities of classification should be noted in the French navigation laws. French navigation is divided into two major classifications, "voyages au long cours" and "voyages au cabotage."

The term "voyages au long cours" is applied, under article 1 of the law of January 30, 1893, to all voyages south of 30 degrees north latitude, north of 72 degrees north latitude, west of 15 degrees longitude west of the meridian of Paris, and east of 44 degrees longitude east of that meridian.

Cabotage, or coastwise trading, is divided into two classifications, "cabotage en douane" and "cabotage en marine."

"Cabotage en douane" comprises voyages between ports in continental France and Algeria and might be roughly described as coastwise trade within the customs limits of France. The term "petit cabotage" is used when the voyage is between two French ports on the same sea, either the Atlantic Ocean or the Mediterranean, and "grand cabotage," when the voyage takes place between two French ports in different seas—i. e., between a port on the Atlantic and a port on the Mediterranean.

"Cabotage en marine" might be described as coastwise trade beyond the customs limits of France and is divided into three classes, namely, "grand" and "petit cabotage" and "cabotage international."

"Grand cabotage" includes coastwise voyages within the limits defined for voyages "au long cours," while "cabotage international" comprises those voyages which are made within the limits prescribed for "voyages au long cours" if they take place between French ports and those of Algeria, or between ports of France or Algeria and foreign ports.¹

French ships making voyages "au long cours" and of more than 200 but less than 700 gross tons register are required to have, in addition to the captain, at least one duly certificated second officer, while those of 700 tons gross register and over must have, besides the captain, at least one second officer and a lieutenant, both duly certificated.²

French ships making voyages in the "cabotage international" or the "grand cabotage national" more than 400 miles from any port of continental France are required to carry, besides the captain, at least a second officer, if of more than 200 but less than 1,000 gross tons register, while those of more than 1,000 tons register are required to carry, in addition to the captain, at least one second officer and a lieutenant.²

¹ Pandectes Françaises, Répertoire series, vol. 40, p. 29.

² Law of Apr. 17, 1907, sec. 21.

JAPAN.

The number of officers required on board Japanese vessels is fixed by the law of 1896 relating to masters, mates, and engineers in the mercantile marine. Article IV of this law, which came into operation on July 1, 1897, provides as follows: "The complement of master, mates, and engineers to be employed on board any vessel and the description of their certificates shall be in accordance with and subject to Table 1." In this table, which is reproduced below, it will be noted that the number of officers and the character of officers' certificates required vary with the character of the voyage in which the vessel is engaged and with the class (steam or sailing) and gross tonnage.

Article VII of the law of 1896 provides, however, that special rules may be prescribed by regulation for the following classes of vessels: (1) Those operating between foreign ports only; (2) those used for fishing or other special purpose; (3) those of special construction.

Article XV provides that "the Minister of Communications may allow an engineer holding a certificate of third-class engineer to act as chief engineer, and not to employ a second engineer on board a large coasting steam vessel of under 500 tons net register, as well as on board a coasting steam vessel of 200 tons and of over 200 tons net register, which are mentioned in Table 1, for a period of one year after the date of enforcement of this law."

The application of the law of 1896 was extended by imperial ordinance No. 31 of October, 1912, to "foreign vessels plying only along the coast or upon a lake, river, or harbor of Japan."

It will be observed that the law provides for three grades of master, two grades of first mate, two grades of second mate, one grade of only mate, and four grades of engineers.

Plying limits and gross tonnage or koku burden of vessels.	Officers to be on board.	Description of certificates.
Foreign going: Steamships—		
Under 500 tons.....	Master..... First mate..... Chief engineer..... Second engineer.....	Master of the first grade. First mate of the first grade. Second-class engineer. Third-class engineer.
500 tons and over.....	Master..... First mate..... Second mate..... Chief engineer..... Second engineer.....	Master of the first grade. First mate of the first grade. Second mate of the first grade. First-class engineer. Second-class engineer.
Sailing vessels—		
Under 200 tons.....	Master..... First mate.....	First mate of the first grade. Second mate of the first grade.
Under 500 tons.....	Master..... First mate.....	Master of the first grade. First mate of the first grade.
500 tons and over.....	Master..... First mate..... Second mate.....	Master of the first grade. First mate of the first grade. Second mate of the first grade.
Large coasting: Steamships—		
Under 200 tons.....	Master..... First mate..... Chief engineer.....	First mate of the second grade. Second mate of the second grade. Third-class engineer.
Under 1,000 tons.....	Master..... First mate..... Chief engineer..... Second engineer.....	Master of the second grade. First mate of the second grade. Second-class engineer. Third-class engineer.

Plying limits and gross tonnage or koku burden of vessels.	Officers to be on board.	Description of certificates.
<i>Large coasting—Continued.</i> <i>Steamships—Continued.</i>		
1,000 tons and over	{ Master..... First mate..... Second mate..... Chief engineer..... Second engineer...	Master of the first grade. First mate of the first grade. Second mate of the first grade. First-class engineer. Second-class engineer.
Sailing vessels—		
Under 200 tons.....	{ Master.....	Mate of the third grade.
Under 500 tons.....	{ Master..... First mate.....	Master of the third grade. Mate of the third grade.
500 tons and over.....	{ Master..... First mate..... Second mate.....	Master of the first grade. First mate of the first grade. Second mate of the first grade.
<i>Coasting:</i> <i>Steamships—</i>		
Under 100 tons.....	{ Master..... Chief engineer.....	Second mate of the second grade. Fourth-class engineer.
Under 200 tons.....	{ Master..... Chief engineer.....	First mate of the second grade. Third-class engineer.
Under 500 tons.....	{ Master..... First mate..... Chief engineer.....	First mate of the second grade. Second mate of the second grade. Second-class engineer.
500 tons and over.....	{ Master..... First mate..... Chief engineer..... Second engineer...	Master of the second grade. First mate of the second grade. Second-class engineer. Third-class engineer.
Sailing vessels—		
Under 200 tons.....	{ Master.....	Mate of the third grade.
200 tons and over.....	{ Master..... First mate.....	Master of the third grade. Mate of the third grade.
<i>Smooth-water steamships:</i>		
Under 200 tons.....	{ Master..... Chief engineer.....	Second mate of the second grade. Fourth-class engineer.
200 tons and over.....	{ Master..... Chief engineer.....	First mate of the second grade. Third-class engineer.

4. NUMBER OF CREW.

UNITED STATES.

There is no law fixing definitely the number of seamen that shall be carried on vessels of the United States. The minimum number of the crew is determined by the local inspectors of the Steamboat-Inspection Service, acting under the power conferred upon them by section 4463 of the Revised Statutes, as amended by the act of April 2, 1908, section 1 of act of March 3, 1913, and section 14 of the act of March 4, 1915.

Formerly, in determining the number of seamen required, the local inspectors took into account only such facts as whether the vessel was a steamship or a sailing vessel, the kind of motive power, the character of trade (whether general cargo, special cargo, or passenger and freight), the route or voyage, and the season of the year.

Now, under section 14 of the act of March 4, 1915, the inspectors must take account of a new factor, namely, statutory requirements as to the manning of lifeboats. This section requires that there shall be an officer or able seaman in charge of every lifeboat and of every pontoon life raft accommodating more than 15 persons, and one certificated lifeboat man on every boat or raft accommodating less than 25 persons, with additional lifeboat men for boats or rafts of larger size. (For further details see page 33 of this report.)

Another provision contained in section 13 of the act of March 4, 1915, relates indirectly to the manning of vessels. This requirement is that, in the first year after the passage of the act, on all vessels of 100 tons gross measurement and over, except those navigating rivers exclusively and the smaller inland lakes, 40 per cent of the

45 per cent; in the third year, 50 per cent; in the fourth year, 55 per cent; and thereafter, 65 per cent. In these quotas licensed officers and apprentices shall not be included.

GREAT BRITAIN.

The merchant shipping act of 1894 (secs. 267 and 268) classifies vessels carrying passengers under two headings, "passenger steamers" and "emigrant ships." Every steamer, British or foreign, which carries passengers to or from any place in the United Kingdom is a "passenger steamer," while the expression "emigrant ship" means every ship, British or foreign, which carries, on any voyage from the British Islands to any port out of Europe and not within the Mediterranean Sea, more than 50 steerage passengers, or a greater number of steerage passengers than in the proportion of one statute adult to every 33 tons of the registered tonnage in the case of a sailing ship, or every 20 tons in the case of a steamship.

As a rule, emigrant ships are vessels of well-known lines, carrying numbers of steerage passengers to North or South America, South Africa, Australia, or New Zealand, and there is, in ordinary cases, no difficulty in determining whether or not a particular vessel is an emigrant ship.

Section 305 of the merchant shipping act of 1894 provides that every emigrant ship must be manned with an efficient crew to the satisfaction of the emigration officer, and the Board of Trade has prepared a set of rules to assist the emigration officer in carrying out this requirement.

In regard to numbers of deck hands, rule 22 of the Instructions Relating to Emigrant Ships, issued by the Board of Trade in 1911, provides as follows:

In steamships deck hands should be carried in accordance with the following scale, which is based on the total boat and raft capacity with which the ship is required to be provided under the statutory rules relating to life-saving appliances.

Total capacity of boats and rafts required under the life-saving appliances rules.	Deck hands to be carried.	Total capacity of boats and rafts required under the life-saving appliances rules.	Deck hands to be carried.
Under 2,500 cubic feet.....	24	6,100 and under 6,500 cubic feet.....	34
2,500 and under 2,900 cubic feet.....	25	6,500 and under 6,900 cubic feet.....	35
2,900 and under 3,300 cubic feet.....	26	6,900 and under 7,300 cubic feet.....	36
3,300 and under 3,700 cubic feet.....	27	7,300 and under 7,700 cubic feet.....	38
3,700 and under 4,100 cubic feet.....	28	7,700 and under 8,100 cubic feet.....	40
4,100 and under 4,500 cubic feet.....	29	8,100 and under 8,500 cubic feet.....	42
4,500 and under 4,900 cubic feet.....	30	8,500 and under 8,900 cubic feet.....	44
4,900 and under 5,300 cubic feet.....	31	8,900 and under 9,300 cubic feet.....	46
5,300 and under 5,700 cubic feet.....	32	9,300 and under 9,700 cubic feet.....	48
5,700 and under 6,100 cubic feet.....	33		

The term "deck hands" means the master and the mates and all bona fide able-bodied seamen. The carpenter, boatswain, quartermasters, lamp trimmer, and other petty officers who have served or are fit to serve in the capacity of A. B. may be regarded as bona fide able-bodied seamen for this purpose. Of the total number of deck hands carried one in five may be an ordinary seaman, and two boys may be taken in place of each ordinary seaman so allowed. One cook and one steward may be reckoned as bona fide able-bodied seamen if they produce proof that they have served as A. B.'s, and the emigration officer is satisfied by actual trial that they can pull an oar and are fit to serve in that rating. Tradesmen, such as joiners, etc., are not to be counted.

In the case of vessels having such a number of passengers as to necessitate the carrying of the maximum boat capacity required by the rules the scale indicates the

In the case of vessels which carry a limited number of passengers and are entitled to a reduced boat capacity, sufficient only for the number of persons carried on that particular voyage, the scale should be applied in the following manner: Add to the number of passengers to be carried the total number of crew, calculating the deck hands as a minimum of 25 men; then allow 10 cubic feet of boat capacity for each statute adult, and the result will be the boat capacity figure in the manning table to be used for that voyage. For example, if there are 300 passengers and a crew of 90, including 25 deck hands, the number will be 390 and the boat capacity 3,900; the number of deck hands required for this boat capacity in the scale is 28.

The scale is applied in all cases unless the Board of Trade has previously allowed the ship under similar circumstances to clear with a smaller number of deck hands.

The number of persons in the engine room and stokehold of emigrant ships is also fixed by the Board of Trade. Rule 23 of the Instructions Relating to Emigrant Ships, issued in 1911, provides as follows:

The following scale has been prepared by the Board of Trade for the guidance of the emigration officers with regard to the manning of the engine room and stokehold:

Nominal horsepower of engines.	Engine-room and stokehold staff required.				
	Engi- neers.	Donkey men.	Greasers.	Store- keepers.	Firemen.
100 to 200.....	4	1		1	1 fireman for every 18 square feet of fire-grate surface in the boilers.
200 to 300.....	4	1	2	1	
300 to 400.....	5	1	3	1	
400 to 600.....	6	1	3	1	
600 and over.....	7	1	3	2	

The scale is intended rather as a guide for dealing with doubtful cases than as a hard and fast rule, and no question is raised with regard to vessels in which the same total manning has been accepted previously.

In the case of vessels clearing for the first time as emigrant ships the fire-grate surface rule will indicate the minimum total manning which should in general be allowed, but if for any adequate reason a somewhat smaller manning is adopted and the assistant emigration officer (engineer) sees no reason to object, the rule need not be insisted on, provided the proposed reduction does not exceed 5 per cent. Any greater reduction should be reported to the board for consideration.

In the case of sailing ships the manning as fixed by the Board of Trade rules¹ is in accordance with the following scale:

Under-deck tonnage.	Officers, etc. ²	Able- bodied seamen. ³	Ordinary seamen. ⁴	Total number.
500.....	6	9	5	20
600.....	7	11	5	23
700.....	7	13	6	26
800.....	7	15	7	29
900.....	7	17	8	32
1,000.....	7	19	9	35
1,100.....	7	20	10	37
1,200.....	7	21	11	39
1,300.....	7	23	11	41
1,400.....	7	24	12	43
1,500.....	7	26	12	45
1,600.....	7	27	13	47
1,700.....	7	28	14	49

¹ Instructions Relating to Emigrant Ships, issued by the British Board of Trade, 1911.

² Includes the master, mates, carpenter, ship's cook, and steward.

³ The boatswain, boatswain's mate, sailmaker (if a seaman), and quartermaster count as A. B.'s.

⁴ The person in charge of the distilling apparatus, if any, or 2 boys, counts for 1 ordinary seaman, but not more than 2 boys to every 500 tons to be so counted. An approved steam winch for saving manual

Vessels with an under-deck tonnage exceeding 1,700 tons are required to have two additional seamen for each 100 tons in excess of 1,700.

In regard to cargo ships and passenger ships, other than "emigrant ships," there appears to be no statutory provision other than that contained in section 459 of merchant shipping act of 1894, which prohibits the departure of any unseaworthy British ship from a British port, and the merchant shipping act of 1897, which provides that undermanning shall be regarded as unseaworthiness.

Section 459 of the act of 1894 was considered as ineffective for the prevention of undermanning by a Board of Trade committee appointed in 1896 to investigate the manning of British merchant ships. The report of the majority of this committee, which was composed chiefly of shipowners and ship operators, recommended a deck manning scale for steamers classified according to gross tonnage and a general manning scale for sailing ships classified according to under-deck tonnage.¹

These recommendations were not, however, adopted by Parliament, which merely passed an amendment to section 459 of the act of 1894, in the form of the merchant shipping act of 1897, referred to above.

Under the act of 1897, however, the Board of Trade has issued certain rules which are contained in Circular 1463. These came into operation in March, 1909, and contain the following provisions:

Foreign-going steamships of over 200 feet in length, or not less than 700 tons gross, when proceeding to sea, should have, independently of the master and two mates, a sufficient number of deck hands available for division into two watches, so as to provide a minimum effective watch, viz, a competent hand at the wheel, a lookout man, and an additional hand on deck available for any purpose.

Foreign-going steamships of over 2,500 tons gross, or of more than 320 feet in length, should have, independently of the master and two mates, not less than 8 efficient deck hands.

Foreign-going steamships of over 5,500 tons gross, or of more than 420 feet in length, should have, independently of the master and two mates, not less than 10 efficient deck hands.

When a steam vessel of less than 200 feet in length, or less than 700 tons gross, or any steam vessel proceeding on a home trade or on a coasting voyage, appears to be unsafe through undermanning, the detaining officer should at once inspect the vessel, obtain all necessary particulars, and report fully to the Board of Trade.

When articles of agreement are being signed or deposited in the case of sailing vessels, the superintendent should, if it appears to him that the number or efficiency of the crew is such as to fall materially below the general practice in similar vessels, as evidenced by the office records, bring the matter to the master's notice in careful and guarded terms, reporting it at the same time to the detaining officer of the Board of Trade.

GERMANY.

No manning scale is provided by law for ships under the German flag. Article 480 of the German Commercial Code provides, however, that the master must make certain before the commencement of the voyage that the vessel is in a seaworthy condition, adequately fitted out and supplied, and sufficiently manned and provisioned.

The only other legal requirement that has been found which relates even indirectly to the number of crew to be carried on German vessels is contained in section 49 of the decree of March 14, 1898, containing regulations for emigrant ships.² This section states that

¹ Report of Board of Trade committee on manning of British merchant ships, 1896, pt. 1, pp. 27-31.

there shall be in the crew of emigrant ships at least two persons skilled in handling an oar for every collapsible lifeboat required, at least three persons for every ordinary rigid boat, and at least four for every (regular) lifeboat.

The rules of the See-Berufsgenossenschaft, like article 480 of the German Commercial Code, requires that every ship shall, before its departure, be properly manned as well as adequately fitted out and provisioned.¹ Under these rules the officials of the See-Berufsgenossenschaft fix the number of seamen to be carried on all German vessels, account being taken in each case not only of the size of the ship but of the length and character of the voyage, the season of the year, and other conditions. The German Government accepts these conclusions, and the number of crew is entered in the official register of German shipping.

In addition, section 9 of the accident prevention rules of the See-Berufsgenossenschaft applicable to steamships provides that all vessels making overseas voyages and more than 90 meters (295 feet) in length or having a gross tonnage of more than 700 register tons shall have a crew of sufficient number in the deck department to provide at least one helmsman, one lookout, and one extra man for special purposes for each watch, of which there must be two.

NORWAY.

No statutory manning scale is provided for ships under the Norwegian flag.

FRANCE.

The French laws do not specify any manning scale and the engagement of the crew is left to the master's discretion,² except in the case of emigrant ships and vessels fishing on the Banks of Newfoundland, which are governed by special regulations as to the number of the crew.³

The number of men in the crew is, however, regulated indirectly by the requirements of the law of April 17, 1907, regarding the division of the crew into watches while at sea, the hours of labor in port, and work on Sunday and holidays, and by the requirements as to payment for overtime work. (See section of this report on hours of labor on French ships, pp. 144-146.)

Section 25 of the law of April 17, 1907, provides, in general, that there shall be in each engine-room watch at least one fireman for every three fires (fourneaux). This general requirement was modified by section 18 of the decree of September 20, 1908. (See p. 145 of this report.)

JAPAN.

There are no statutes or regulations prescribing the methods of manning vessels in the Japanese merchant marine. The matter is left entirely to the discretion of the ship's owners.

¹ Unfallverhütungsvorschriften der See-Berufsgenossenschaft für Dampfer (1909 edition), ch. 1, sec. 1.

² Art. 223 of Code de Commerce.

³ Decrees of Mar. 15, 1861, and Feb. 19, 1892.

5. AGE, PHYSICAL CONDITION, ABILITY, AND EXPERIENCE OF OFFICERS.**UNITED STATES.**

The qualifications necessary for obtaining a license as master, chief mate, or second and third mates, if in charge of a watch, engineer, and pilots of all steam vessels and the masters of all sailing vessels of over 700 tons gross register are prescribed by the Board of Supervising Inspectors.

All licenses issued to these officers are for a term of five years, subject to suspension and revocation upon satisfactory proof of bad conduct, intemperate habits, unskillfulness, or want of knowledge of the duties of his station on the part of any officer.¹

The General Rules and Regulations of the Board of Supervising Inspectors of the Steamboat-Inspection Service make three principal classifications of vessels, according to the general character of the trade in which they operate, as follows: (I) Ocean and coastwise; (II) lakes, bays, and sounds; (III) rivers.

The qualifications required for licensed officers vary quite naturally with the trade of the vessel, less experience of a certain character and more of another being required in one class than in another.

The various licenses required for officers on board steamships of the United States of more than 100 gross tons and on sailing vessels of more than 700 gross tons are indicated in the following table:

1. Master:	6. Chief engineer:
(a) Ocean steamer.	(a) Ocean steamer.
(b) Coastwise steamer.	(b) Condensing lake, bay, or sound steamer.
(c) Ocean or coastwise sailing vessel.	(c) Noncondensing lake, bay, or sound steamer.
(d) Lake, bay, or sound steamer.	(d) Condensing river steamer.
(e) Ferry steamer on lakes, bays, or sounds.	(e) Noncondensing river steamer.
(f) Passenger barge on lakes, bays, or sounds.	7. First assistant engineer:
(g) River steamer.	(a) Ocean steamer.
(h) Ferry steamer on rivers.	(b) Condensing lake, bay, or sound steamer.
(i) Passenger barges on rivers.	(c) Noncondensing lake, bay, or sound steamer.
2. Chief mate:	(d) Condensing river steamer.
(a) Ocean steamer.	(e) Noncondensing river steamer.
(b) Coastwise steamer.	8. Second assistant engineer:
3. Second mate:	(a) Ocean steamer.
(a) Ocean steamer.	(b) Condensing lake, bay, or sound steamer.
(b) Coastwise steamer.	(c) Noncondensing lake, bay, or sound steamer.
4. Third mate:	(d) Condensing river steamer.
(a) Ocean steamer.	9. Third assistant engineer:
(b) Coastwise steamer.	(a) Ocean steamer.
5. Mate:	(b) Condensing lake, bay, or sound steamer.
(a) Ocean steamer.	
(b) Coastwise steamer.	
(c) Inland steamer (lakes, bays, or sounds).	
(d) River steamer.	

Apparently there is no statutory age requirement for officers of any grade on vessels of the United States, but administrative regulations provide that all licensed officers must be 21 years of age or over.

All persons examined for any of the above licenses are required to pass tests as to eyesight and color vision and ability properly to

hear the bell and whistle signals. There appears to be no general physical examination.

The ability of applicants for original licenses as officers of any of the above grades is tested by a written examination. The character of the examination varies, of course, with the license.

An illustration of the character of the most stringent requirements for license of master is afforded in the following statement of requirements for license of master of an ocean vessel:¹

Any applicant for license as master of ocean steam vessels shall be subjected to such examination as shall satisfy the inspectors that he is capable of navigating such vessels and of determining latitude from the meridian altitude of the sun, latitude by ex-meridian altitude of the sun, latitude from the meridian altitude of a star, latitude by the pole star, latitude by a. m. and p. m. chronometer time sights, longitude by sunrise or sunset sights, ship's position by Sumner's method, ship's position by traverse sailing, including the correction of courses for leeway, current, deviation, and variation, one of which courses to be a departure course, and of finding course and distance by Mercator's sailing, and be capable of determining the deviation of the compass by an amplitude and azimuth, and the time of high water at a port named; he must also be familiar with charts and chart navigation, storm signals, international code of signals, and with the use of the gun and rocket apparatus for saving life from shipwreck as practiced by the United States Life-Saving Service. (Sec. 4439, R. S.)

The examination for master of a river steamer, on the other hand, is much less stringent and may be said to represent the other extreme in requirements. This examination, unlike that for master of an ocean steamship, contains no reference to ability to determine latitude, to methods of finding course and distance, etc., but relates more largely to such subjects as general knowledge of duties of master of river vessels, executive ability, knowledge of signals, signal lights, pilot rules, etc.²

In the matter of educational standards required in the United States and other maritime countries for masters and mates, the following tabular comparative statement, which is reproduced from the Shipping World Yearbook for 1915 (p. 245), is of interest:

Subjects.	England.	Belgium.	France.	Germany.	Holland.	United States.
Algebra.....	No.....	No..... ⁺	Yes.....	Yes.....	Yes.....	No.
Geometry.....	No.....	Yes.....	Yes.....	Yes.....	Yes.....	No.
Trigonometry.....	Yes.....	Yes.....	Yes.....	Yes.....	Yes.....	Yes.
Mechanics.....	No.....	No.....	Yes.....	Yes.....	No.....	No.
Physics.....	Yes.....	No.....	Yes.....	Yes.....	Yes.....	Yes.
Steam engine.....	No.....	Yes.....	Yes.....	No.....	Yes.....	No.
Languages.....	No.....	No.....	Yes.....	Yes.....	Yes.....	No.
Winds and currents.....	Yes.....	Yes.....	Yes.....	Yes.....	Yes.....	Yes.
Navigation.....	Yes.....	Yes.....	Yes.....	Yes.....	Yes.....	Yes.
Nautical astronomy.....	Yes.....	Yes.....	Yes.....	Yes.....	Yes.....	Yes.
Nautical survey.....	No.....	No.....	No.....	No.....	Yes.....	No.
Instruments.....	Yes.....	Yes.....	Yes.....	Yes.....	Yes.....	Yes.
Observations.....	Yes.....	Yes.....	Yes.....	Yes.....	Yes.....	Yes.
"First aid".....	Yes.....	Yes.....	Yes.....	Yes.....	Yes.....	No.

As to experience required of licensed officers, the time specified in the regulations varies, naturally, with the position. In the case of masters and mates, the requirement is that the applicants shall have had a specified number of years experience in the deck department, the number of years varying with the capacities and trade in which

¹ General Rules and Regulations of Steamboat-Inspection Service, edition of Aug. 11, 1915. p. 105.

² Ibid., p. 330.

the applicant has served.¹ These requirements are too detailed to be summarized or reproduced in the report.

The requirements as to experience for position of engineer also are very detailed. They are given in full in the General Rules and Regulations of the Steamboat-Inspection Service, pages 111 to 114, 224 to 227, and 333 to 335.

GREAT BRITAIN.

All officers of British vessels are required to be duly certificated before they go to sea. The British Board of Trade grants certificates of competency as a result of examination held by local marine boards at their respective ports for each of the following grades: Master, first mate, second mate, and only mate of a foreign-going ship; master and mate of a home-trade passenger ship; first-class engineer and second-class engineer of all steamships. In this connection it should be noted that a certificate of competency for a foreign-going ship is considered to be of a higher grade than the corresponding certificate for a home-trade passenger ship.²

Masters and mates are required to pass tests as to eyesight, color vision, and hearing, as well as oral and written examinations in such subjects as general navigation ability, the use of nautical instruments, trigonometry, physics, astronomical observations and computation of a nautical character, and knowledge of winds and currents.

The present requirements for license as engineers are summarized in the Shipping World Yearbook for 1915 (pp. 245-246), as follows:

On and after January 1, 1915, the qualifications as regards sea service required from candidates for certificates of competency as engineer in the mercantile marine will be as follows:

A candidate for a second-class engineer's certificate will be required, in addition to the apprenticeship described in paragraph 23 of the Regulations Relating to the Examination of Engineers, or the alternative sea service specified in Board of Trade Circular 1469, to have served 18 months at sea as engineer on regular watch on the main engines or boilers of a foreign-going steamer of not less than 66 nominal horsepower; or 27 months in a home-trade steamer of not less than 66 nominal horsepower.

A candidate for a first-class engineer's certificate, in addition to the qualifications required from a candidate for a second-class engineer's certificate, must have served at sea for 18 months, with a second-class certificate of competency or service on regular watch on the main engines or boilers of a foreign-going steamship of not less than 99 nominal horsepower as senior engineer in charge of the whole watch; or have served at sea for 27 months with a second-class certificate of competency or service as second engineer of a home-trade steamer of not less than 99 nominal horsepower; or 3 years with a second class certificate of competency or service as second engineer of a home-trade steamer of not less than 99 nominal horsepower; or have served 3 years 9 months with a second-class certificate of competency or service as third engineer of a home-trade steamer of not less than 99 nominal horsepower, if during the entire period he has been the senior engineer in charge of the whole of a watch on the main engines and boilers; or possess, or be entitled to, a first-class certificate of service.

The service described in paragraphs 38, 39, 40, and 41 of the regulations may, as heretofore, be accepted as qualifying for examinations in accordance with the conditions specified in those paragraphs.

A candidate for either a second-class or first-class certificate who ~~within~~ ^{within} two years from date of application to be examined has attended an approved course comprising general mathematical and scientific instruction at a technical school recognized by the Board of Trade as suitable for the training of marine engineers, will be allowed to count time so spent as equivalent to sea service in the ratio of three months at the

¹ General Rules and Regulations of Steamboat-Inspection Service, edition of Aug. 41, 1915, pp. 104-111, 221-224, 329-332.

technical school to two months at sea. Time so spent can not be accepted as equivalent to more than one-sixth of the total sea service required for either certificate, but a candidate who has been allowed to count such time on examination for a second-class certificate will not be debarred from counting similar subsequent time on examination for a first-class certificate. Time spent in an approved marine technical school subsequent to obtaining a first-class certificate and within two years from the date of application to be examined, may also be accepted, as forming part of the qualifying service to be required under paragraph 28 of the regulations, in the case of candidates for extra first-class engineer's certificates, but if such time is substituted for sea service, it will only count as equivalent thereto in the ratio of three months at the school to two months at sea. In every case in which an allowance is made for time spent at a marine technical school, the candidate will be required to produce the principal's certificate for continuous and regular attendance at all the approved classes and for satisfactory progress.

GERMANY.

Examinations are required for the following officers on German ships other than those engaged in deep-sea fishing.¹

- | | |
|---|---|
| 1. Master:
(c) Küstenfahrt.
(b) Kleine Fahrt.
(c) Grosse Fahrt.
2. Pilot.
3. Chief engineer. | 4. Engineers:
(a) Class I.
(b) Class II.
(c) Class III.
(d) Class IV. |
|---|---|

For the character and limits of trade comprised in the terms "Küstenfahrt," "kleine Fahrt," and "grosse Fahrt," as well as "Nahfahrt" and "mittlere Fahrt," the reader is referred to pages 80 and 81 of this report.

An officer holding a license as a master in the Küstenfahrt is entitled to command nonpassenger merchant ships of any size, except those in the Nahfahrt and of less than 250 cubic meters (88 register tons) in the Küstenfahrt.²

A license as master in the kleine Fahrt entitles the holder to command the following classes of vessels: (a) In the Nahfahrt, vessels of any size whether carrying passengers or not; (b) in the Küstenfahrt and the kleine Fahrt, merchant vessels of less than 400 cubic meters (140 register tons), steam towing vessels of less than 600 cubic meters (210 register tons), and lighters of any size.²

A master in the kleine Fahrt may also act as pilot on steam towing vessels of 400 to 1,000 cubic meters (140 to 350 register tons) in the Küstenfahrt or kleine Fahrt.²

A license as master in the grosse Fahrt entitles the holder to command any vessel of any class or size in any trade.²

A pilot's license enables its holder (1) to perform pilot service on any vessel of any class or size in any trade and (2) to command the same classes of vessels as a master in the kleine Fahrt.²

The general requirements as to age and experience for license of master of the three grades are as follows:

¹ Bekanntmachung, betreffend den Befähigungsnachweis und die Prüfung der Seeschiffer und Seesteuerleute auf deutschen Kauffahrteischiffe, Jan. 16, 1904 (Reichs-Gesetzblatt, p. 3).

Master.	Minimum age.	Minimum experience.
Küstenfahrt.....	15 years...	50 months on deck at sea on merchant ships or fishing vessels, including 12 months on sailing vessels.
Kleine Fahrt.....	do.....	60 months on deck at sea, including at least 12 months on sailing vessels; experience before 18 years of age to count only as half.
Grosse Fahrt.....	do.....	24 months' actual experience as pilot in mittlere or grosse Fahrt, or on ships of at least 400 cubic meters (140 register tons) in Küstenfahrt or kleine Fahrt or as master of vessel in kleine Fahrt. Not more than 12 months' experience in the Küstenfahrt to be counted. Execution of nautical observations and computation and their uses during this period.

Applicants for license as pilot are required to have had since 15 years of age, at least 45 months' actual service at sea in the deck department. This service must include at least 24 months' experience as an able seaman (Vollmatrose) on merchant ships, including at least 12 months on a sailing vessel or as an Obermatrose in the German Navy.

Masters and pilots are required also to have a physical examination and to be examined as to eyesight, color vision, and hearing. They are, moreover, examined orally and in writing as to their knowledge of seamanship, mathematics, the use of nautical instruments, etc. For further details, which are too numerous to summarize or present in this report, the reader is referred to the "Bekanntmachung betreffend den Befähigungsmachweis und die Prüfung der Seeschiffer und Seesteuerleute auf deutschen Kauffahrteischiffe, issued January 16, 1904 (Reichs-Gesetzblatt, p. 3).

The following table shows the classes of trade in which holders of engineers' licenses of the several grades may take charge of engines:

Engineer of Class IV:

- (a) In the Nahfahrt: Steamships of any class or size.
- (b) In the Küstenfahrt: Nonpassenger steamships.
- (c) In the mittlere Fahrt: Sailing ships with auxiliary motor power.

Engineer of Class III:

- (a) In the Küstenfahrt: Steamships of any class or size.
- (b) In the kleine Fahrt: Nonpassenger steamships.
- (c) In the mittlere Fahrt: Sailing ships with auxiliary motor power.

Engineer of Class II:

- (a) In the kleine or the mittlere Fahrt: Steamships of any class or size.
- (b) In the East Asiatic trade between 11 degrees south and 55 degrees north latitude and between 90 and 150 degrees east longitude: Steamships of any class or size.
- (c) In the East African and West African coasting trade: Steamships of any class or size.
- (d) In grosse Fahrt: Steamships of any class or size.

Engineer of Class I:

- (a) All trades: Steamships of every class and size except those in the grosse Fahrt that carry more than 50 passengers and that have a boiler heating surface area of more than 2,000 square meters (21,528 square feet) or a gross tonnage of more than 25,000 cubic meters (8,830 registered tons).

A chief engineer (schiffingenieur) is entitled to have charge of the engines of any ship of any class or size operating in any trade.

The requirements as to experience for engineers may be summarized as follows:

Engineer of Class IV.—Five years service, after 15 years of age, either wholly in the engine room of a steamship, or partly in the engine room of a steamship and partly in machine shops or boiler works. At least two years must have been spent in the engine room

Engineer of Class III.—Five years experience in a machine shop, boiler works, or engine works and in the engine room of an ocean steamship, including at least two years engine-room experience and at least two years shop experience.

Engineer of Class II.—Either (1) six years experience in boiler or engine construction or repair shops and in engine room of a steamship, with at least three years spent in boiler or engine works and at least two years in the engine room of an ocean steamship as engineer or assistant, or (2) seven years experience as engineer of Class III and three years experience in a machine shop or in boiler or engine works, either before or since serving as engineer of Class III.

Engineer of Class I.—At least two years actual service as engineer of Class II in the *kleine, mittlere, or grosse Fahrt*.

Chief engineer (schiffsingenieur).—Seven years service in the machine shop of a large plant for the construction of boilers for steamships and in the engine room of a steamship. The experience in the boiler works must cover at least three years, including one-half year in the blacksmith and boilersmith departments. Two and one-half years must have been spent, either as assistant or in a higher capacity, in the engine room of an ocean steamship, engaged in the *kleine, mittlere, or grosse Fahrt*, but not including more than 12 months experience in the *kleine Fahrt*. In addition, attendance upon a course of two semesters at an approved marine engineering school is required.

NORWAY.

The present law regarding the qualifications necessary for masters and mates on vessels under the Norwegian flag is contained in the law of April 7, 1906, which came into force on January 1, 1907. This law requires that masters and mates on all Norwegian ships shall be licensed except in the case: (1) Of vessels or ships of not more than 25 tons net register engaged in any trade; (2) steamships of not more than 25 tons gross register engaged in any trade; (3) sailing ships of any size in the home trade; and (4) pleasure craft in any trade.

There appears to be two classes of licenses for mates and six for masters of vessels. The licenses are granted only to persons who have reached a certain age and have had a certain amount of experience at sea, and who are able to demonstrate a practical knowledge of seamanship.

The following is a list of the various kinds of licenses required:

Masters' licenses:

Master of sailing vessels of—

1. More than 25 tons net register, in the Arctic Ocean and White Sea trade; or 25 to 80 tons net register, in the trade with Swedish ports, as far as and including Ystad, and Denmark; or 25 to 200 tons net register, in the fishing and similar trades at sea.
2. Less than 500 tons net register in any trade.
3. Any size in any trade.

Master of steamships of—

1. 25 to 200 tons gross register engaged—
 - (1) In the home trade;
 - (2) In the Arctic Ocean and White Sea trades;
 - (3) In the trade with Swedish ports, as far as and including Ystad, and Denmark;

Mates' licenses:

Mate of sailing vessel of any size in any trade.

Mate of steamship of any size in any trade.

To obtain a license as master of sailing vessels of more than 25 net tons engaged in the Arctic Ocean and White Sea trades, or of 25th to 80 tons net register in the Swedish and Danish trade, or of from 25 to 200 net tons engaged in the fishing or sealing trades, a person must have the following qualifications:

(1) Must be 21 years of age or over.

(2) Must have served at least 30 months at sea since his fifteenth year of age, including at least 18 months' service on board a sailing vessel.

(3) Must have a certificate attesting his knowledge of the use of charts, logs, soundings, compass, international steering rules, distress and fog signals, and of life-saving apparatus. This certificate must be secured from the manager of a licensed navigation school or from the principal of a navigation school under the control of the Inspector of Norwegian Fisheries. A certificate showing that the candidate has passed the required examination for mate of an approved navigation school may be substituted for this certificate.

(4) Must show a certificate from a qualified physician as to eyesight, color vision, and hearing.

The qualifications for master of a steamship of 25 to 200 tons gross register are quite similar to those mentioned above for master of small sailing ships. The age requirement and those as to knowledge of the use of charts, logs, etc., and the requirement as to eyesight, color vision, and hearing are the same in both cases, as is also the period of service at sea, except that in the case of the masters of small steamships the requirement is for at least 12 months' experience at sea in that class of vessel.

To secure a license as master of a sailing vessel of less than 500 tons net register in any trade the candidate must have served at sea for at least 24 months after obtaining a license as mate and for at least 12 of the 24 months he must have served as first or sole mate, or, temporarily, as master of a foreign-going sailing ship, while during the remaining 12 months he may have served in the same capacity on board either a sailing vessel or steamship in another trade or as second mate in the foreign trade.

To command a sailing vessel of any size in any trade a person must have all the qualifications required for a master of a sailing vessel under 500 tons.

To secure a license as master of a steamship of less than 450 tons gross register in any trade a person must have served at sea for at least 24 months after obtaining a mate's certificate and for at least 12 months of this period he must have served as first or only mate or acted temporarily as master in a foreign-going steamship, while during the remaining period he must have served in the same capacity in a steamship or sailing vessel in another trade or as second mate in the foreign trade. In lieu of this experience he may offer experience of 12 months' service as master in a foreign-going sailing vessel with at least 6 months' service on a steamship.

To command a steamship of any size in any trade it is necessary

obtaining a mate's certificate, with at least 12 months' service as first or only mate or as acting captain of a foreign-going steamship, with the remainder of the service either in the capacity of first or only mate on a steamship or sailing vessel in any other trade or as second mate in the foreign trade. In lieu of this experience, however, he may offer experience as a master of a foreign-going sailing vessel for a period of at least 12 months and at least 3 months' experience in a steamship of at least 300 gross tons operating in the foreign trade or at least 6 months in another trade.

The licenses for mates as indicated above are of two kinds. Mates of sailing vessels of any size in any trade and mates of steamships of any size in any trade.

To secure a license as mate of a sailing vessel a person must have served at sea since completing his fifteenth year at least 42 months, including 30 months' service on a foreign-going sailing vessel.

To obtain a license as mate of a steamship the following requirements as to service are made:

(1) At least 42 months' service at sea since 15 years of age, including at least 12 months on a foreign-going steamship; or

(2) At least 12 months' service as mate on a foreign-going sailing vessel, and, in addition, at least 6 months' service since completing his fifteenth year of age on a foreign-going steamship; or

(3) At least 6 months' service as master of a foreign-going sailing vessel.

A license as mate, either of a sailing vessel or of a steamship of any size in any trade, may also be obtained by any person who has passed the naval school examination and has served or is serving as an officer in the Norwegian Navy. Such persons may obtain a master's certificate for the command of a sailing vessel or steamship of any size in any trade if they have served at sea for 24 months after obtaining a mate's certificate, but at least 12 months of this service as mate must have been spent on board a foreign-going sailing vessel or steamship in the mercantile marine.

Service on board foreign vessels is accepted on equal terms with service on vessels of Norwegian registry.

In addition to the above requirement as to age, physical condition, and experience at sea, candidates for license as mate or master are required to pass written and oral examinations.

The examination for mate comprises the following subjects: (1) Norwegian language, (2) English language, (3) navigation, (4) seamanship, steering rules, etc.

The examination for master comprises all of the subjects specified for mates' examination, and, in addition, the following: Mechanics, commercial law, maritime law, hygiene, and first aid.

FRANCE.¹

The principal rules regarding the qualifications of officers in the French merchant marine were enacted by the decrees of January 26, 1857, October 2, 1880, and September 18, 1893. This last decree abolished the title of "*capitaine au long cours*" (captain of a sea-going vessel) and introduced the title of "*capitaine de la marine marchande*" (captain of the merchant marine) in its place; but the decree of March 7, 1896, reestablished the old title.

The decree of December 29, 1901, provides that the command of sailing vessels and steamships equipped for the foreign trade shall be intrusted only to those persons who hold the commission of a captain, ordinary or superior, and have had at least two years' experience on ships under the French flag in the capacity of a second captain or lieutenant, including at least one year's service on a ship of the class (sailing vessel or steamship) he is to command.

License of captain in over-seas trade.—Candidates for the license of a captain, ordinary or superior, must be Frenchmen and must pass two examinations, one theoretical, the other practical. The theoretical test may be taken by anyone who has reached the age of 17 years. To be admitted to the practical test, the candidate must have reached the age of 24 years and must furnish proof that since his sixteenth year he has had at least 60 months of actual and professional experience in navigation, including at least 36 months' service on vessels equipped for the foreign trade. Seamen who have reached the age of 24 years and satisfy the conditions specified above, may take the two examinations, theoretical and practical, at one time or separately in the order of their choosing.

The theoretical examination for a captain's license consists of written and oral tests. The written tests include French composition; two series of calculations of the customary types; a series of questions bearing on the knowledge required. Failure in either of the first two tests results in exclusion. The oral tests include arithmetic, algebra, plane and solid geometry, plane and spherical trigonometry, cosmography, navigation, mechanics, steam engines, geography. The candidates for superior commissions are examined further on matters comprised in a supplementary program which includes the theory of ship construction, physics, chemistry, and history, in addition to special questions in arithmetic, algebra, geometry, and the other tests common to both classes of commission.

The practical examination for a captain's license consists of written and oral tests. The written tests include a sea report and a review of nautical calculations. The oral tests include rigging, evolutions, rules of the helm and of the run, signals and lights, employment of life-saving apparatus, physical characteristics of the globe, ship and engine construction, rules and regulations of maritime police, maritime commercial law, English, a practical review of the subjects comprised in the theoretical examination concerning nautical calculations, the use of charts and reflecting instruments, and the adjustment of the compass. Candidates for a superior commission must, furthermore, answer special questions comprised in a supplementary program of practical tests and bearing upon evolutions, ship construction, and the maritime commercial law.

Ordinary captains may obtain a superior license by passing an examination in the matters comprised in the supplementary programs of theoretical and practical tests. This does not abrogate the favor granted by article 1 of the decree of April 10, 1895, to seamen admitted as captains of seagoing vessels before the decree of September 18, 1893, went into effect, who would still be in a position to benefit by it.

Midshipman of the merchant marine.—Candidates for the license of a midshipman of the merchant marine formerly could obtain

the same without any specific requirements as to age or experience in navigation by simply passing the theoretical examination for captain of a seagoing vessel. The decree of 1902, however, requires that they shall be examined on practice and shall have had experience in navigation. It further provides that "a license as midshipman of the merchant marine shall be conferred on any seaman who, having passed the theoretical examination required for obtaining the license of captain, ordinary or superior, and having since his sixteenth year had experience in navigation, actual and professional, on seagoing ships under the French flag, of at least 12 months on steamers or at least 9 months on sailing vessels, shall have passed successfully a practical examination as to rigging, evolutions, rules of the helm and the run, signals and lights, and employment of charts, sextant and compass."

First and second mates in over-seas trade.—The decree of 1902, considering old requirements insufficient, requires that first and second mates also must hold licenses.

To perform the duties of first mate on ships equipped for the over-seas trade a person must hold the license of captain, ordinary or superior, or, if he holds the certificate of officer of the merchant marine, must furnish proof that he has had at least 48 months' service as a seaman under the French flag since his sixteenth year.

To exercise the functions of second mate on ships in the over-seas trade a person must hold either the license of captain, ordinary or superior, or the commission of officer of the merchant marine, or, if he holds the license of midshipman of the merchant marine, must prove that since his sixteenth year he has had at least 24 months' experience as seaman upon seagoing ships under the French flag. In exceptional cases the post of lieutenant on board a ship having at least one other officer may be given to a midshipman of the merchant marine who does not fulfill that condition.

Officer of the merchant marine.—Candidates for the license of officer of the merchant marine must be Frenchmen and pass a theoretical and a practical examination. In order to be admitted to the examination the candidate must be 21 years of age and must furnish proof that since his sixteenth year he has had at least 36 months of experience as a seaman under the French flag, including at least 24 months' service on seagoing ships.

The examination for officer of the merchant marine consists of written and oral tests. The written tests include a sea report and two series of calculations of the usual types. Failure in one of these tests results in exclusion. The oral tests include elements of practical arithmetic, elementary geometry, elements of practical navigation, elementary knowledge of the employment of steam engines, rigging, evolutions of steamers and sailing ships, elements of physical characteristics of the globe, rules of the helm and the run, signals and lights, employment of life-saving apparatus, and laws and regulations of the maritime police.

Masters of coasting vessels.—The masters of coasting vessels being mostly called upon to command small sailing vessels or fishing smacks, in the running of which no knowledge of steam engines or

a special commission of master of a coasting sailing vessel be created. The decree of 1901 complied with this request by creating two classes of commissions for commanders of coasting ships, one permitting only the running of sailing ships, the other, called the superior commission, permitting the running of any coasting ship.

Article 12 of the decree of 1902 provides that to be admitted to the command of a merchant ship, whether a sailing vessel or a steamship, employed in the coastwise trade, a person must hold either the commission of captain in the over-seas trade, ordinary or superior, or a superior commission of master of a coasting ship, or, if he holds the diploma of an officer of the merchant marine, must fulfill the conditions as to age and experience required of the candidates for the commission of master of a coasting ship. Seamen holding the ordinary commission of master of a sailing ship are allowed to command sailing ships only.

The subjects covered in the examinations for officer of the merchant marine and for master of a coasting ship being the same, article 11 of the decree of 1902 grants seamen holding the diploma of officer of the merchant marine the right to obtain without a new examination the superior commission of master of a coasting ship and to command sailing vessels or steamships employed in the coastwise trade if they have had the required experience.

Candidates for the commission of master of a coasting ship, ordinary or superior, must be French and pass two examinations, one theoretical and the other practical. They may take these two examinations at one time or separately and in the order of their own choosing; but in the latter case a seaman who passed only one of these two tests must take the other within the next three years. To be admitted to either examination the candidate must have reached 24 years of age before the examination and furnish proof that since his sixteenth year he has had an experience of at least 60 months as a seaman under the French flag, including at least 36 months' service on a ship engaged in the foreign or the coasting trade.

The theoretical examination for the commission of master of a coasting ship consists of written and oral tests. The written tests include a sea report and two series of calculations of the customary types. Failure in one of these tests results in exclusion. The oral tests include elements of practical arithmetic, elementary geometry, and elements of practical navigation. Candidates for a superior commission are further questioned on matters comprised in a supplementary program bearing on the elementary principles of the use of steam engines.

The practical examination for the commission of master of a coasting ship consists of oral tests which include rigging, evolutions of sailing ships and of small boats, rules of steering and running, signals and lights, employment of life-saving apparatus, and laws and regulations of the maritime police. The candidates for the commission of master of a coasting vessel are further questioned on port entrances and the currents and the tides within the limits assigned to coastwise shipping. The candidates for the superior commission have to answer further special questions comprised in a supplementary

The ordinary masters of coasting ships may obtain the superior commission by passing an examination in matters comprised in the supplementary programs, both theoretical and practical.

The superior masters of coastwise ships may obtain the diploma of an officer of the merchant marine by passing an examination in such matters only as have not been comprised in the examinations which they have passed already. Masters of coastwise ships in the colonial trade may under the same conditions obtain the commission of a master of a coastwise ship in France whether ordinary or superior.

7

JAPAN.

The qualifications of officers in the Japanese mercantile marine are set forth in the following laws and regulations: (1) Law Relating to Masters, Mates, and Engineers in the Mercantile Marine, issued in 1896; (2) Detailed Regulations for the Enforcement of the Law Relating to Masters, Mates, and Engineers in the Mercantile Marine, issued in 1905; (3) Regulations Relating to the Examination of Masters, Mates, and Engineers in the Mercantile Marine, as revised to 1913.

The regulations call for 31 classes of licenses for masters, mates, and engineers on Japanese vessels, as follows:¹

Master:

1. First grade—
 - (a) General.
 - (b) Steamship.
 - (c) Sailing vessel.
2. Second grade.
3. Third grade.

First mate:

1. First grade—
 - (a) General.
 - (b) Steamship.
 - (c) Sailing vessel.
 - (d) Fishing vessel, general.
 - (e) Fishing steamship.
 - (f) Fishing sailing vessel.
2. Second grade—
 - (a) General.
 - (b) Fishing vessel.
 - (c) Lake, river, or harbor vessel.
3. Third grade—
 - (a) General.
 - (b) Fishing vessel.

Second mate:

1. First grade—
 - (a) General.
 - (b) Steamship.
 - (c) Sailing vessel.
 - (d) Fishing vessel, general.
 - (e) Fishing steamship.
 - (f) Fishing sailing vessel.
2. Second grade—
 - (a) General.
 - (b) Fishing vessel.
 - (c) Lake, river, or harbor vessel.

Engineer:

1. First class.
2. Second class.
3. Third class.
4. Fourth class—
 - (a) General.
 - (b) Lake, river, or harbor vessel.
 - (c) Motor boat.

The classes of trade and the character and size of vessel which holders of these licenses are competent to command are indicated in the table on pages 83-84 of this report, except that no reference is there made to officers' licenses in the fishing and the lake, river, or harbor trades.

As to age requirements, Article III of the Regulations Relating to the Examination of Masters, Mates, and Engineers provides that all licensed officers and engineers must be more than 20 years of age.

As to physical condition, every candidate for license as officer is required to undergo a physical examination.²

The ability of applicants for a license as officer is tested by means of written and oral examinations, except that no written examination is required in the following cases: First mate of second grade, for lake, river, or harbor vessel; second mate of second grade, for lake, river, or harbor vessel; fourth-class engineer, for lake, river, or harbor vessel; fourth-class engineer on motor boats.

The character of the written and oral examinations is indicated in the following list of subjects covered in the examinations for master of the first-grade and first-class engineer:

Examination of master of the first grade.—Written: Computation of the time of a star's meridian passage and of its meridian altitude; finding the latitude by the altitude of a star; computation of the time of moon's meridian passage; finding the latitude by sun's ex-meridian altitude; construction and use of Napier's diagram of deviation.

Oral: Adjustments of the compass; construction of jury rudder for vessel, also raft; handling of a disabled vessel; heaving a keel out and steps of temporary repairs to a vessel; and any subjects that may be deemed necessary by the examiner concerning the duties of a master.

Examination for first-class engineer.—Written: Strength of engines, strength of boilers, the pitch of screw, temperature, expansion of steam, strength of materials, applied problems of cube root, calculation concerning indicator diagrams, etc.; drawings of parts of engines and boilers.

Oral: Efficiency and harm of heat in general and of the heat in engines and boilers; explanation of strength required in various parts of engines and boilers; explanation of materials for engine and boiler construction; relations between the propelling force and friction of various parts of engines; general principles of comparison of various engines based upon the use of steam and its expansion; explanation of actions of slide valve, indicator gauge, and indicator diagrams; the proportions of the principal parts of engine and boiler and of quantities of coal and water; and any subjects that may be deemed necessary by the examiner concerning the duties of first-class engineer.

The experience at sea required of applicants for officers' licenses varies with the grade of the license. The general nature of these requirements is indicated in the following statement of the requirements for masters of the first grade:

Master of first grade, general.—Qualifications for steamship master of first grade and at least one year's service at sea on square-rigged sailing vessels or the qualifications for sailing-vessel master of first grade and one year's service at sea on square-rigged sailing vessel and one year's service at sea on steamship of at least 500 gross tons.

Steamship master of first grade.—License as first mate of first grade or as master of second grade and one year's service at sea as first mate on steamship of at least 500 tons, or license as master of second grade and at least one year's service at sea on steamship of at least 200 gross tons.

Sailing vessel master of first grade.—License as first mate of first grade and one year's service at sea as master of a foreign-going sailing vessel, or one year's service at sea as first mate of a foreign-going sailing

6. AGE, PHYSICAL CONDITION, ABILITY, AND EXPERIENCE OF CREW.

UNITED STATES.

Prior to the passage of the act of March 4, 1915, there were no statutory or regulatory requirements as to ability or experience of the crew other than the requirement that a vessel should be properly manned. There was no age requirement and none as to physical condition, ability, and experience of seamen in any part of the crew. The act of March 4, 1915, however, introduced requirements of this character, which, taken in the aggregate, probably make the regulations of the United States on this subject more stringent than those of any other country.

Age.—The act of March 4, 1915, provides that in the deck department of all vessels of more than 100 tons gross measurement, except those navigating rivers exclusively and the smaller inland lakes, there shall be a certain proportion of seamen with the rating of able seamen, and to qualify as able seaman a sailor must be at least 19 years of age. There is no age requirement for other seamen employed in the deck department nor for members of the crew in the other departments of the ship's service.

Physical condition.—Prior to the act of March 4, 1915, no member of the crew was required to be examined as to general physical condition, eyesight, and hearing. Now, those rated as able seamen in the deck department must be examined in all these respects.¹

Ability and experience.—Able seamen, as provided for in the act of March 4, 1915, are divided into two principal classes—those employed on vessels operating on the high seas and those on vessels navigating the Great Lakes or smaller lakes, bays, and sounds.² The requirement as to length and character of service is not the same for both classes.

To be rated as able seamen for service on a seagoing vessel, the following experience is required: (1) 'Three years' service on deck at sea or on the Great Lakes, or on the smaller lakes, bays, or sounds,² with no examination other than as to general physical condition, eyesight, and hearing, or (2) one year's experience on deck at sea or on the Great Lakes or smaller lakes, bays, or sounds,² together with an oral examination to test the knowledge of the duties of seamanship.

Able seamen for service on the Great Lakes or the smaller lakes, bays, or sounds must have had at least 18 months' experience on deck at sea, on the Great Lakes or the smaller lakes, bays, or sounds.²

The act provides that graduates of school ships approved by and conducted under rules prescribed by the Secretary of Commerce who have served 12 months at sea may be rated as able seamen for service at sea or on the Great Lakes or the smaller lakes, bays, or sounds. In fact, however, there are no such school ships.

Persons qualifying as able seaman with only one year's experience, it will be noted, must pass an examination as to their knowledge of seamanship, while those with at least three years' experience are exempted. The number of the former class may not, however, exceed one-fourth of the quota of able seamen required on any vessel.

The character of the oral and practical examination which applicants with one year's experience must pass is indicated in Department Circular No. 264, Steamboat-Inspection Service, issued September 15, 1915:

The professional examination will be conducted as concisely as possible, with the view of determining the applicant's qualifications, and will embrace the following subjects:

(a) Boxing the compass. The applicant will be required to box the compass by points or degrees, according to the experience he has had in the use of either method.

(b) Lights and fog signals. A knowledge will be required of the running and anchor lights for steam and sailing vessels on the sea, inland waters, or Great Lakes, and a like knowledge of fog signals, according to the waters on which the applicant has served.

(c) Signals for starting, stopping, slowing down, and backing the engines of steam vessels. This examination will be restricted to the signals in use on the sea or Great Lakes, according to the waters on which the applicant has served. In view of the widespread use of engine telegraphs, knowledge of engine bell signals, while deemed advantageous, will not be required if in other respects the candidate qualified.

(d) Passing signals for steam vessels. To be confined to vessels meeting or passing under ordinary conditions.

(e) Knotting, bending, splicing, and hitching. The applicant will be required to make a few of the principal knots, bends, splices, and hitches in common use by sailormen.

(f) Ability to pull an oar. The applicant's knowledge of pulling an oar will be determined by actual trial in a boat.

(g) Clearing away, lowering, and getting a boat away from the ship. The applicant's ability will be determined by actual trial aboard ship.

(h) Handling boats at sea. This examination will include questions relative to the proper handling of a boat in running before a heavy sea; in pulling into a sea; the trip of the boat; and steering with an oar, tiller, or yoke.

(i) Knowledge of nautical terms. The applicant will be required to definitely locate different parts of a ship, and to give the names of the different masts, sails, rigging, davits, etc.

(j) Steering. The applicant will be required to demonstrate his knowledge of handling the wheel of a steamer by obeying orders passed to him as "wheelman."

Section 14 of the act of March 4, 1915, requires experience and training of another sort from members of the crew holding certificates as "lifeboat men."

Lifeboat men may be drawn from any department of the crew, provided they prove to the satisfaction of the inspection officials or other Government officers, that they have the following qualifications: (1) Training in all operations connected with launching lifeboats and the use of oars; (2) knowledge of the practical handling of lifeboats; (3) ability to understand and answer orders relative to lifeboat service.

Ability to understand language of officers.—Another requirement introduced by the act of March 4, 1915, is that not less than 75 per cent of the crew of any vessel subject to the act (all vessels of 100 tons gross and upward, except those navigating rivers exclusively and the smaller inland lakes) must be able to understand any order given by the officer of such vessel.

The manner in which this requirement is being construed is indicated clearly in Department of Commerce Circular (Bureau of Navigation) No. 265, issued September 18, 1915, by the Secretary of Commerce and reading in part as follows:

This section will take effect as to vessels of the United States on November 4, 1915, and as to all foreign vessels on March 4, 1916.

The Department construes the words "able to understand any order given by the

The Department does not construe the above section as requiring the use of any particular language on the part of officers and crew of any vessel. Any language which is understood in sufficient measure by both the officers and the proper proportion of the crew will comply with the law. It must clearly be understood, therefore, that the section can not be construed as requiring an English-speaking crew. For example, on a French vessel the French language is spoken by the officers and if understood by the proper proportion of the crew would suffice. The same would be true of Spanish on a Spanish vessel, of German on a German vessel. Therefore, no specific language is required, but only that whatever language is used it shall be understood as the law requires.

The Department also construes the section as meaning only such orders as may normally be given to members of the crew in each department of the vessel in the course of the usual performance of their regular duties. Among these duties, however, should be included lifeboat work or emergency work for such members of the crew as may be called upon to perform these classes of work. The Department would not consider it a proper construction of the section to require, for example, that a waiter should understand orders normal to the engine-room force or that a stoker should be required to understand orders which related solely to the work of a deck hand or seaman. In the cases, however, of a waiter, a stoker, a seaman, or other employee on the vessel who was assigned to do emergency or lifeboat work it would be a proper construction of the section to require him to understand orders for such emergency or lifeboat service.

The Department construes the section to mean that a demonstration in the presence of the customs collector or his deputy by the proper proportion of the crew in executing the actual orders of an officer would be a sufficient proof of compliance with the law. It will be noted that the orders are to be given "by the officer" and not by the customs collector or any one acting in his behalf.

The Department further construes the section to mean that the muster of the crew for which the law provides shall take place at such reasonable times and occasions as will determine the facts sufficiently in advance of the time fixed for the sailing of the vessel to permit the engaging of such new members of the crew as may be necessary in time for the vessel to sail without delay. The Department understands the law to require the safeguarding of the vessel through the language test by such means, at such times, and in such a manner as shall be helpful and not hurtful to our maritime commerce and that it is in no sense intended to be used to create embarrassment or to cause unnecessary expense or delay.

GREAT BRITAIN.

The provisions of the British laws and regulations are not now, on the whole, as strict as those of the United States in their requirements as to ability and experience of members of the crew.

Age.—There appears to be no minimum age requirement for boys engaged as apprentices or in other capacities on board British merchant vessels. But section 392 of the merchant shipping act of 1894 provides that no boy under 13 years of age may enter into an apprenticeship to the sea-fishing service.

In this connection it is interesting to note that the Board of Trade Committee on the Manning of Merchant Ships recommended in its report filed in 1896 that a candidate for the rating of A. B. (able-bodied seaman) should be 19 years of age or over and have had three years' service at sea as a deck hand and that an O. S. (ordinary seaman) should be 17 years of age and have had one year's service at sea. The recommendation was also made that men shipping as firemen should be at least 18 years of age and should be required to show six months' service as trimmer in a steamship. These recommendations were made in connection with the general recommendation that Parliament should enact a manning scale for all British vessels which would stipulate a certain proportion of able-bodied seamen in the crew.¹ But although they were the recommendations of practical steamship owners and operators they were not adopted in full by

Parliament and there is to-day in Great Britain no requirement as to minimum age for able-bodied seamen, ordinary seamen, or trimmers. Nevertheless, it is believed that the spirit of this recommendation is in fact observed in the engagement of crews.

Physical examination.—Members of the crew of British vessels are not required to undergo examination as to eyesight, color vision, or general physical condition.

Experience.—The British laws contain no requirement as to length of service and experience of seamen. The laws refer to "ordinary seamen," "able-bodied seamen," and "efficient deck hands" but there is no requirement that ships' crews shall be composed in whole or in any part of any class.

Section 58 of the merchant shipping act of 1906 provides merely that a seaman shall not be entitled to the rating of A. B., or able-bodied seaman, unless he has served at sea for three years before the mast. The employment of fishermen in duly registered decked fishing vessels counts only as sea service up to the period of two years, so that the rating of A. B. is granted only after at least one year's sea service in a trading vessel and two or more years' sea service on board a decked fishing vessel so registered.

It will be noted that this section does not require the employment of able-bodied seamen, but merely specifies what experience is necessary to obtain that rating, the purpose being, in all probability, to make certain an automatic advance in wages and rank for seamen having a certain experience.

As to efficient deck hands the Board of Trade Circular 1463 (which came into operation in March, 1909) contains the following requirements, which, it will be noted, call for the employment of a "competent hand at the wheel," as well as specified numbers of "efficient deck hands," but fails to specify the standards of competency in the one case and of efficiency in the other:

Foreign-going steamships of over 200 feet in length, or not less than 200 tons gross, when proceeding to sea, should have, independently of the master and two mates, a sufficient number of deck hands available for division into two watches, so as to provide a minimum effective watch, viz, a competent hand at the wheel, a lookout man, and an additional hand on deck available for any purpose.

Foreign-going steamships of over 2,500 tons gross, or of more than 320 feet in length, should have, independently of the master and two mates, not less than eight efficient deck hands.

Foreign-going steamships of over 5,500 tons gross, or of more than 420 feet in length, should have, independently of the master and two mates, not less than 10 efficient deck hands.

When a steam vessel of less than 200 feet in length, or less than 700 tons gross, or any steam vessel proceeding on a home trade or on a coasting voyage, appears to be unsafe through undermanning, the detaining officer should at once inspect the vessel, obtain all necessary particulars, and report fully to the Board of Trade.

When articles of agreement are being signed or deposited in the case of sailing vessels, the superintendent should, if it appears to him that the number or efficiency of the crew is such as to fall materially below the general practice in similar vessels, as evidenced by the office records, bring the matter to the master's notice in careful and guarded terms, reporting it at the same time to the detaining officer of the Board of Trade.

Ability to understand language of officers.—The laws of Great Britain now provide that no seaman shall be engaged for service on any British ship at any port in the United Kingdom or on the Continent of Europe

between the River Elbe and Brest, inclusive, unless, in the opinion of the superintendent or other officer before whom the seaman is engaged, he possesses "a sufficient knowledge of the English language to understand the necessary orders that may be given to him in the course of the performance of his duties."

This provision, which is contained in part¹, section 12, of the merchant shipping act of 1906, does not, however, "apply to any British subject or inhabitant of a British protectorate or to any 'lascar.'"² Accordingly, Chinese engaged at the British port of Hongkong or at ports in other British possessions in the Far East, as well as lascars, who are natives of British India, may be employed on British ships regardless of their ability to speak the English language. Moreover, the act does not limit the proportion of the crew speaking the English language, but applies, with the exceptions named, to all seamen aboard the vessel.

The language requirement applies to seamen engaged at European ports between the River Elbe (or Hamburg) and Brest, as well as British ports, that is, within the so-called "home-trade limits."³ Large numbers of seamen employed on British ships have been shipped from European ports convenient to England, where lower rates of wages prevail.

It is interesting to note that the British legislation was based upon recommendations made in 1903 by a select committee of the Board of Trade on the mercantile marine. The main object of the investigations made by this committee was to determine ways and means by which natives of the British Isles might be induced in larger numbers to take to the sea. In its report the committee made the following statement, which, since it is the deliberate opinion of men well versed in shipping, should have great weight:⁴

"From the point of view of both of the safety of ships and of the comfort of the British seamen employed, we think that it would be of great advantage if an adequate knowledge of English in foreign seamen serving in British ships could be secured, and we recommend that after a certain period, say three years, the local superintendent of the Board of Trade should be empowered to forbid any foreign seaman to be shipped with a British ship unless he possesses a knowledge of the English language sufficient for the understanding of orders, but we think that any such provision should not apply to lascars or other Asiatics or Africans.

The manner in which the language test is applied is indicated in Board of Trade Circular 1427, issued November, 1907, which reads as follows:

(1) Under section 12 of the act of 1906 it is the duty of the superintendent or consul at a home-trade port, before permitting a foreign seaman to sign the agreement of a British vessel, to satisfy himself that the seaman possesses a sufficient knowledge of the English language to understand the necessary orders given to him in the course of his duties.

(2) In most cases a conversation with the seaman will probably be sufficient to enable the officer to form a trustworthy opinion as to the extent of the man's knowledge of English.

(3) If the seaman is able to follow the officer in his explanation of the articles of agreement and of the stipulations they contain, and if he is able to state in intelligible English his age, nationality, address, last ship, etc., to be entered in the agreement preparatory to signing on, a few additional questions put either by the officer, or by the master of the ship, will be sufficient to test his ability to understand the terms of the agreement in giving orders on board ship.

(4) In doubtful cases the officer should supplement this test by asking a few essential questions relating to his duties that require more than "yes" or "no" for an answer, before deciding whether the seaman may be regarded as complying with the requirements of the section.

(5) When a foreign seaman has been allowed by a superintendent or other proper officer to sign an agreement at a port in the United Kingdom or within the home-trade limits after the date on which section 12 comes into force, the officer before whom the man is discharged should make and sign an indorsement on page 3 of the seaman's continuous discharge book to the following effect: "This seaman signed an agreement after December 31, 1907." The indorsement should be stamped with the office stamp.

(6) The indorsement should not be made in the case of substitutes who have not been engaged before a superintendent or other officer.

(7) The proper officer shall not under this section refuse to allow a seaman holding a discharge certificate so indorsed to sign an agreement unless he considers that there are special reasons for the refusal. Special reasons are only likely to arise in exceptional circumstances; e. g., where there is strong evidence that the seaman is in possession of an indorsed discharge certificate which does not belong to him. The proper officer should, accordingly, exercise great caution before refusing to allow the engagement of a seaman holding a discharge certificate properly indorsed, and in every case where such refusal is found to be necessary, a full report should be forwarded to the Board of Trade.

(8) The proper officer will observe that the provisions of section 12 do not apply to British subjects, inhabitants of British protectorates, or lascars. When a seaman claims to come under one of these categories, the proper officer should as far as possible satisfy himself that this is the case.

GERMANY.

The German laws are stringent as regards the qualifications of seamen for service aboard German vessels.

Age.—The Seemannsordnung¹ provides that no German under the age of 15 may be employed in any capacity on board vessels under the German flag.

Physical conditions.—The requirement is that every member of the crew shall undergo a physical examination before being shipped, in addition to examinations as to eyesight and color vision.

The German Federal Council by a decree² dated July 1, 1905, issued in conformity with the provisions of paragraph 4, section 7, of the Seemannsordnung of July 2, 1902, promulgated the following regulations relative to the qualifications of seamen for service on German ships:

1. On merchant ships whose voyages extend beyond the limits of "kleine Fahrt" the members of the crew must undergo before their engagement a physical examination as to their fitness. Vessels engaged in fishing on the high seas are exempted from these provisions in the case of voyages in North European waters.

2. If the engagement or muster takes place in a German port, the investigation is to be made by a physician. The master and shipowner are entitled to be present in person or be represented at the examination. In non-German ports, the captain may, in case it is difficult to secure a physician, conduct the examination himself and, if possible, in the presence of an official of the seamen's office.

The investigation of female employees may be made only by a physician. At the request of the physician, or of the person to be examined, another female may be present.

3. The results of the examination shall be set down in writing and a memorandum thereof is to be kept by the shipowner for two years.

The shipowner must give the seaman at the termination of his service, at his request, a copy of the report of his physical condition.

Persons found upon examination to be physically unfit for service shall not be engaged.

The following are regarded in part as grounds for unfitness: General debility, mental disease, epilepsy, and other severe nervous troubles, severe heart pains, any contagious diseases, tuberculosis, syphilis (as indicated by the presence of sores on the skin and in the mouth), gonorrhea (as indicated by discharge) and chancre.

Any person afflicted with the following troubles shall be considered as unfit for special branches of the ship's service: Acute rupture, numerous ulcers, fistula, large tumors, extreme difficulty in hearing, or deafness.

In the examination for service as fireman or trimmer the special demands in these branches of services for efficiency and endurance shall be taken into account. Fleishy persons or those suffering from heart trouble shall be excluded from those departments. Persons under 18 years of age may be engaged as fireman or trimmer in exceptional cases, and then only with the consent of the examining officer.

The physician must inform the captain or the shipowner at once concerning the presence of such diseases as in the opinion of the examining physician render the applicant unfit for general or special service or only conditionally fit.

4. Seamen on all ships, regardless of the character of the voyage, must undergo examinations as to eyesight and color vision. Seamen engaged for deck service are to be examined before their first engagement at home in conformity with the regulations regarding eyesight and color vision, established by decree of the Imperial Chancellor of May 9, 1904. Only such persons as have undergone the examination and have been given a certificate testifying to the fact that they have satisfactory eyesight and color vision will be employed as lookouts.

Before the vessel leaves port where the crew has been engaged the captain must have a careful inspection made.

5. The shipowner is responsible for the execution of these provisions without, however, affecting in the least the obligations of the captain.

6. The Imperial Chancellor is empowered in conjunction with the local government to make exceptions to the above provisions.

7. These provisions have no application to the officers of the ship.

8. The provisions shall take effect October 1, 1905.

Experience.—There is, apparently, in the navigation laws and regulations of Germany, no express requirement as to experience for seamen in any department of the vessel. However, section 52 of the Seemannsordnung of June 2, 1902, makes reference to three classes of seamen, namely, apprentices (Schiffsjunge), ordinary seamen (Leichtmatrosen), and able seamen (Vollmatrosen), and provides that after two years of service on vessels at sea more than two years, in the absence of agreement to the contrary, an apprentice shall be entitled to the wages of an ordinary seaman, and an ordinary seaman to the wages of an able seaman. It would seem, therefore, that at least two years' experience is required as an apprentice to become an ordinary seaman and at least two years' more experience as an ordinary seaman to secure rating of able seaman. Reference is also made to ordinary seamen and able seamen in the regulations regarding the experience required of applicants for licenses as masters or pilots.

Ability to understand language of officers.—The German regulations do not contain, so far as can be discovered, any requirement that all or any part of the crew shall speak the language of the officers well enough to be able at least to understand orders.

NORWAY.

Age.—The provisions of the Norwegian laws with respect to the qualifications of the crew stipulate no minimum age at which a seaman may be shipped, except in the case of stokers or coal trimmers in foreign-going ships, who, it is provided, must be at least 17 years of age.¹

Physical condition.—Every seaman before being engaged for deck service on board a Norwegian vessel must prove by certificate from a qualified physician that he is capable of distinguishing the colors prescribed by laws or regulations for ship lights, and that he does not suffer from any material defect in his powers of vision or hearing.¹

Section 85 of the law of public supervision of the seaworthiness of ships of September 18, 1909, as amended on December 14, 1909, provides that any person, on being engaged on board a ship for trade beyond Europe, must have a certificate from a qualified physician, stating that he does not suffer from any malignant infectious disease or tuberculosis of such a character that conveyance of the disease to others may be apprehended. This certificate must be made out within a fortnight before signing on.

On being engaged at home in a ship for European trade, and always on engaging abroad, a seaman must declare before the engaging officer that he does not, to the best of his knowledge and belief, suffer from any of the diseases above mentioned. If while employed abroad there is reason to suppose that any member of the crew suffers from any such disease, the master shall, as soon as possible, cause a medical examination to be held. If it is proved that a disease does exist, the master shall discharge the patient, unless the necessary treatment for counteracting the spread of the disease can be given him on board.

Ability and experience, and ability to understand language of officers.—Apparently there is no requirement as to experience, general ability, or ability of members of the crews of Norwegian vessels to understand the language of the officers.

FRANCE.

The provisions of the French laws distinguish only three classes of merchant seamen—sailors, apprentices, and boys. No distinction is made between able-bodied seamen and ordinary seamen, and there is, moreover, no test of efficiency or qualification required in order to obtain each rating.²

Age.—Article 11 of the decree of September 20, 1908, provides that no apprentice of less than 18 years of age may be shipped on a fishing dory.

JAPAN.

There are no definite provisions in the Japanese laws with respect to the qualifications necessary for service in the crew of Japanese vessels.

7. SHIPPING AGREEMENTS.

UNITED STATES.

The provisions of the United States laws specify that no person shall be carried to sea as one of the crew on board a vessel bound from a port in the United States to any foreign port who has not, before beginning the voyage, signed an agreement in writing or in print with the master of the vessel. Vessels engaged in trade between the United States and British North American possessions, or the West

Indies Islands, or the Republic of Mexico, or any vessel of the burden of 75 tons or upward, bound from a port on the Atlantic to a port on the Pacific, or vice versa, however, are excepted from this requirement. Every agreement except such as are otherwise specially provided for must be signed by each seaman in the presence of a shipping commissioner, and must contain the following particulars:

1. The nature and, as far as practicable, the duration of the intended voyage or engagement, and the port or country at which the voyage is to terminate.¹

2. The number and description of the crew, specifying their respective employments.¹

3. The time at which each seaman is to be on board to begin work.¹

4. The capacity in which each seaman is to serve.¹

5. The amount of wages which each seaman is to receive.¹

6. A scale of the provisions which are to be furnished each seaman.¹

7. Any regulations as to conduct on board and as to fines, short allowances of provisions, or other lawful punishments for misconduct, which may be sanctioned by Congress or authorized by the Secretary of Commerce, not contrary to or not otherwise provided for by law, which the parties agree to adopt.²

8. Any stipulations in reference to allotment of wages or other matters not contrary to law.³ This provision was repealed so far as it relates to allotments in trade between the United States, Dominion of Canada, Newfoundland, the West Indies and Mexico, and the coasting trade of the United States, except between Atlantic and Pacific ports, by section 25 of the act of December 21, 1898.

When a crew is first engaged the agreement must be signed in the presence of a shipping commissioner and must be made out in duplicate, one part to be retained by the shipping commissioner and the other part, containing a special place or form for the description and signature of persons engaged subsequently to the first departure of the ship, to be delivered to the master.⁴ Every master who engages any seaman or seamen in a foreign port in which there is a consular officer or commercial agent must procure the sanction of such officer and engage seamen in his presence.⁵

GREAT BRITAIN.

The provisions of the British laws with respect to the engagement of seamen are very similar to those of the United States. The master of every British ship, except ships of less than 80 registered tons exclusively employed in trading between the different ports on the coasts of the United Kingdom, must sign an agreement with the seamen in the presence of a superintendent of the shipping office of the Board of Trade.⁶ This agreement shall be dated at the time of the first signature thereof, must be signed by the master before the seaman signs the same, and must contain the following particulars:

1. Either the nature, and, as far as practicable, the duration of the intended voyage or engagement, or the maximum period of the voyage or engagement and the places or parts of the world, if any, to which the voyage or engagement is not to extend.

2. The number and description of the crew, specifying how many are engaged as sailors.

3. The time at which each seaman is to be on board or to begin work.

4. The capacity in which each seaman is to serve.

5. The amount of wages which each seaman is to receive.

¹ Rev. Stat., 4511.

² Act of Mar. 3, 1897, sec. 19, and act of Feb. 14, 1903, sec. 10.

³ Act of June 26, 1884, sec. 10.

6. A scale of the provisions which are to be furnished each seaman.

7. Any regulations as to conduct on board and as to fines, short allowances of provisions, or other lawful punishment for misconduct which have been approved by the Board of Trade as regulations proper to be adopted, and which the parties have agreed to adopt.

The agreement with the crew shall be so framed as to admit of such stipulations, to be adopted at the will of the master and seaman in each case, whether respecting the advance and allotment of wages or otherwise, as are not contrary to law. If the master of a ship registered at a port out of the United Kingdom has an agreement with the crew made in due form according to the law of that port or of the port in which her crew were engaged, and engages single seamen in the United Kingdom, those seamen may sign the agreement so made, and it shall not then be necessary for them to sign an agreement in the form approved by the Board of Trade.¹

The British laws stipulate that the superintendent must cause the agreement to be read over and explained to each seaman, or otherwise ascertain that each seaman understands the same before he signs it, and he must also attest each signature. As in the case of the United States, when the crew is first engaged, the agreement must be signed in duplicate, one part to be retained by the superintendent and the other, containing a special place or form for the descriptions and signatures of substitutes or persons engaged subsequently to the first departure of the ship, to be delivered to the master.

The above provisions do not apply to lascars or any native of India with whom special agreements are entered into, which bind them to proceed either as passengers or as seamen to any port in the United Kingdom where they are to enter into a further agreement to serve as seamen in any ships which may happen to be there, and to be bound to any port in British India. The master or owner of any ship may also enter into a similar special agreement with any lascar, binding him to proceed to any port in the Australian colonies where he is to enter into a further agreement to serve on any ship bound to the United Kingdom or any other part of the Empire. The further agreement must be directly supervised by some officer appointed for the purpose in the United Kingdom by the Secretary of State in Council of India, or in any colony by the governor of the colony, for the purpose of making certain that the further agreement is in all respects a proper agreement for the lascar or native to make.²

In this connection it is interesting to note that no seaman is to be engaged on board any British ship at any port in the British Islands, or on the continent of Europe between the River Elbe and Brest, inclusive, if, in the opinion of the superintendent or other officer before whom he is engaged, the seaman does not possess a sufficient knowledge of the English language to understand the necessary orders that may be given to him in the course of the performance of his duties. British subjects or inhabitants of the British protectorates and lascars, however, do not come under this requirement.³

¹ Merchant shipping act of 1894, sec. 114.

² *Ibid.*, sec. 125.

³ Merchant shipping act, 1906, sec. 12.

GERMANY.

The provisions of the German law stipulate that the nature of the shipping articles entered into with the seamen must be read aloud at a seamen's office before the commencement or continuation of the voyage. If this can not be done without delaying the voyage, however, it may be done as soon as the next seamen's office is reached, and the cause of the delay must be entered in the ship's log. There must be present at the signing of the shipping articles both the seaman and the master or other duly authorized representative of the shipowner. Professional employment agents for seamen are forbidden to act as representatives.¹

The articles of agreement are drawn up by the seamen's office and must contain the following particulars:

1. Name and nationality of vessel.
2. Name and residence of master.
3. Name, residence, and rank of each seaman.
4. Port of departure.
5. Terms of shipping agreement, especially the hourly rate of pay for overtime work.
6. Other special arrangements.

In particular, the articles must state the daily allowance of food and drink for each seaman. By special arrangement with the officers of the vessel, the entry may be limited to a recital of the principal features therein included.

A feature of the German laws in connection with the articles of agreement between the crew and the master or owner of the ship is the sea voyage or service book which is given to every seaman by the seamen's office. This book is intended to be a continuous record of each successive service of the holder on board German ships, the entries being made at the time of each discharge by the master of the ship and by the cooperating German seamen's office or consulate. In order to receive a new sea-voyage book the old book must be produced, or its loss proved, and an entry of this fact must be made in the new book. If the loss is satisfactorily explained, a statement must be added to the entry regarding the former rating, length of service, and weekly contributions which have been collected from the seaman for invalidism insurance, so far as these facts can be sufficiently established.

If the seaman is a German, he is not permitted to take service on board ship before he has completed his fourteenth year. He must also prove his military status, and, if he is a minor, he must also show that his legal guardian has given his consent. With the sea-voyage book the seaman must be given copies of the seamen's act (*Seemannsordnung*), the law concerning the obligations of masters of merchant ships to return seamen from foreign ports, the law on the seamen's employment agencies, and an official compilation of the provisions concerning the military status of the maritime and semi-maritime population.

The German laws likewise provide that any seaman who, according to his sea-voyage book, has previously been engaged is not to be allowed to reship until he has proved the termination of his former service by the proper entry in his sea-voyage book. If, in the opinion

of the seamen's office, such an entry can not be secured, but the termination of the service can otherwise be established, an entry to that effect made by the seamen's office will be adequate.

NORWAY.

When a seaman is engaged for any voyage in a Norwegian ship, the Norwegian laws stipulate that an agreement shall be drawn up and subscribed to by both parties and an account book be delivered to the seaman.¹

It is required that the agreement be drawn up in a form prescribed by the Government and that it contain the following information:

1. Full name of seaman engaged.
2. Age and place of birth.
3. Voyage or voyages or time of service stipulated.
4. Capacity in which he is engaged to serve.
5. Amount of wages.
6. Special conditions agreed to by the parties.
7. Supposed duration of voyage, if wages are fixed for the voyage. This statement is to serve as the basis in the calculation of wages when they are to be computed by time.

The account book, which is required to be delivered to the seaman, is to contain a certified copy of the agreement and an extract, prepared by the direction of the public authorities, of the rules of the maritime law of Norway concerning the rights and duties of the crew, and other regulations of particular interest to the seaman.² If a seaman makes agreements to serve several ships simultaneously, the earliest agreement has priority, although the master to whom the seaman's patent, or account book, has been delivered is first entitled to the services of the seaman.³

FRANCE.

Before the departure of the ship, the French laws require that the sailors engaged for the voyage must be presented by the owner or captain to the commissioner of maritime inscription, who must also be informed of the details of each clause, the conditions of the engagement contract, and the scale of wages. The commissioner is required to have the articles of agreement read aloud in the presence of the crew and assure himself that the seamen thoroughly understand the sense and the import of the contract. He is expected to oppose the adoption of conditions contrary to law.

The commissioner of maritime inscription enters in the articles of agreement the following particulars:

1. Name of the seaman engaged.
2. Address.
3. District (quartier) to which he belongs.
4. Page and number of his entry in the "Maritime Inscription."
5. Amount of salary to be paid.
6. Various conditions of the engagement contract.

Three copies of the articles of agreement are drawn up: One to be retained by the captain; one by the commissioner; and the third by the seaman.

Every French seaman is given an account book (*livret de solde*) and a service book (*livret matricule*). The latter is retained in the particular district of the Inscription Maritime to which the seaman belongs.¹

JAPAN.

The Japanese regulations regarding the employment and discharge of seamen are contained chiefly in chapters 2 and 4 of the mariners' law of 1899. This law has been supplemented by "Detailed Regulations for the Enforcement of the Mariners' Law," issued in June, 1899, in Notification No. 25 of the Department of Communications.

Article III of chapter 2 of this law provides that every seaman in the Japanese merchant marine shall have a marine-service book. It is provided further that "the applicant shall furnish the following information, establishing its correctness by a certificate of a census official or by other duly attested document; except when the application is made to the maritime authorities of the place of the applicant's registered domicile or residence, provided that such officials discharge the functions of a census office:"

1. Name of applicant.
2. Registered domicile.
3. Personal status.
4. Date of birth.

A minor wishing to become a mariner shall obtain the permission of his legal representative.

The manner in which seamen are engaged is indicated in the following sections of chapter 4:

ART. XXVI. In case of the employment or discharge of a seaman, or of the alteration or the renewal of his contract of engagement, the seamen's list shall be forwarded to the maritime authorities and their approval shall be obtained.

ART. XXVII. The approval of the maritime authorities shall be signified by reading over the particulars written in the seamen's list to both parties, and by causing them to affix their signatures and seals thereto; provided that, in case of the discharge of a seaman, approval may be given, if a proper reason exists, although one of the parties concerned be not present. If the parties do not possess seals, their signatures shall be sufficient; if they can not sign, another person shall sign for them with their consent, and shall append their seals; if they neither can sign nor are in possession of seals, their names may be written by another person and they shall affix their thumb mark (*boin*). In case the parties do not seal, or if some person writes their names for them, or if they affix their thumb mark, in accordance with the provisions of the above clause, the reason thereof shall be recorded in the seamen's list.

ART. XXVIII. The parties may apply for approval through their representatives, provided that proper reason exists for such a course.

ART. XXIX. When approval has been obtained on the seamen's list, every seaman shall present his mariner's service book, and apply for attestation of that approval to the maritime authorities.

ART. XXX. In case of any dispute with regard to the discharge of a seaman, one of the parties concerned may apply to the maritime authorities for approval of the discharge, stating the reason. If the maritime authorities consider the application reasonable, they shall summon both parties to appear before them with the seamen's list and the mariner's service book, and shall approve the discharge. If one of the parties concerned does not appear, the maritime authorities may approve the discharge on consideration of the statements made by the other party; in such a case the reason thereof shall be recorded in the seamen's list and in the mariner's service book. In the cases mentioned in the two foregoing clauses, the maritime authorities may require both parties to forward to them the seamen's list or the mariner's service book.

ART. XXXI. The master shall keep the mariner's service book during the term of the seaman's employment.

ART. XXXII. In case of desertion of a seaman from the vessel during his term of engagement, the master shall, without delay, return the mariner's service book of the said seamen to the maritime authorities.

ART. XXXIII. In case of the discharge of a seaman, the latter may apply to the master for a testimonial of his ability or of his character or conduct.

ART. XXXIV. In case of loss of, or damage to, the seamen's list, the master shall prepare a new list and apply to the maritime authorities for approval of it.

8. WAGES.

UNITED STATES.

Mode and frequency of payment.—The United States laws require that the master or owner of any vessel making coasting voyages shall pay to every seaman his wages within two days after the termination of the agreement under which he was shipped, or at the time such seaman is discharged, whichever first happens.¹

In the case of vessels making foreign voyages, or from a port on the Atlantic to a port on the Pacific, or vice versa, wages must be paid within 24 hours after the cargo has been discharged, or within 4 days after the seaman has been discharged, whichever first happens.¹

It is furthermore provided that the seaman is entitled in all cases to be paid at the time of his discharge a sum equal to one-third of the balance of wages then due him.¹

Formerly, under section 4530 of the Revised Statutes, as amended by section 5 of the act of December 21, 1898, a seaman on a vessel of the United States might demand one-half of the wages due him at every port at which the vessel loaded or discharged cargo, unless an agreement to the contrary was expressly stipulated in the contract. This provision extended only to vessels under the American flag and made no restrictions as to the frequency with which wage payments might be demanded, but the fact that the seaman might by express agreement waive the benefit of this privilege, as was almost universally done, made the provision practically a dead letter.

Section 4 of the act of March 4, 1915, changed this condition by providing that the seaman could not in any manner waive the privilege of demanding one-half of the wages due him at any port at which the vessel might stop to load or discharge cargo. At the same time the exercise of this privilege was limited by this act to once in every five days, and was also expressly extended to the seamen of foreign vessels while in harbors of the United States.

Advances and allotments.—Under the laws of the United States it is unlawful to pay wages to any seaman in advance of the time that he has actually earned the same, or to pay such advance wages or to make any order or note or other evidence of indebtedness therefor to any other person.²

It is also unlawful to pay any person for the shipment of seamen when payment is deducted or is to be deducted from a seaman's wages.²

In case advance wages or allotments are paid the master or owner of the vessel is not absolved from paying the wages in full after the same have been actually earned and such advance payment is no defense to a libel suit or action for recovery of such wages.²

¹ Rev. Stat., 4529, as amended by sec. 4 of the act of Dec. 21, 1898, sec. 4 of the act of June 28, 1906, and sec. 3 of the act of Mar. 4, 1915.

All stipulations for the allotment of any part of the wages of a seaman during his absence which are made at the commencement of the voyage are required to be inserted in the agreement and must state the amounts and times of the payments as well as the persons to whom they are to be made.¹

The provisions of the law in regard to allotments apply with equal force to foreign vessels while in harbors of the United States. Formerly, the regulations as to allotments were applicable to foreign vessels only so far as they did not conflict with treaties in force between the United States and foreign countries, but section 11 of the act of March 4, 1915, removes this proviso and section 16 provides that provisions of foreign treaties that conflict with any of the provisions of this act shall be abrogated upon due notice to the foreign Government.

Section 10 of the act of February 14, 1903, permitted a seaman to stipulate in his shipping agreement for an allotment, not exceeding one month's wages, to an "original creditor" in liquidation of any just debt for board or clothing contracted prior to his engagement. This provision applied only to seamen on vessels operating from a port on the Atlantic to a port on the Pacific, or vice versa, or on vessels in a foreign trade, except trade between the United States and Canada, or Newfoundland, or the West Indies, or Mexico. Under section 11 of the act of March 4, 1915, such allotments are not provided for and are therefore not permitted.

In reference to the general subject of allotments, the Commissioner of Navigation in his annual report for 1913 (p. 40), made the following statement:

The allotment system on vessels of the United States is well-nigh extinct, excluding the few square-rigged vessels still employed in our commerce. Only 185 allotment notes were issued to seamen, except 64 in the case of dependent relatives. The whole question of the abolition of the allotment note in the United States, accordingly, relates only to the crews of foreign cargo steamers, especially those clearing from our ports in the Gulf of Mexico and the South Atlantic States, where the seafaring population is small, and to ports on the Pacific coast.

On January 1, 1913, the maximum allotment for trans-Atlantic voyages on steamers was reduced to five days' pay. This reduction in the schedule has been carried out without any inconvenience, so far as I am aware, or any delay to commerce, and further reductions will be undertaken next year.

The Supreme Court has held that the allotment law applies with equal force to men who are secured in ports of the United States for duty on British ships as well as on American ships. The act of 1898 preserves treaty rights in the matter of allotment notes. Several efforts to obtain a judicial determination of whether in fact the treaties of various nations, excluding Great Britain, cover the issue of allotments to seamen engaged on shore in American ships have been unavailing.

Payment for overtime work.—The statutes of the United States contain no requirement as to the payment of wages for overtime work. The hours of service while at sea and in port are clearly defined in section 2 of the act of March 4, 1915, as well as the character of emergency service that may be required after hours, but nothing is said about payment for other service performed after hours.

GREAT BRITAIN.

Mode and frequency of payment.—The British laws distinguish two classes of ships to which the provisions of the law regarding payment of wages apply, namely, foreign-going ships and home-trade ships.

In the case of foreign-going ships (except ships employed on voyages for which seamen by the terms of their agreement are wholly compensated by a share in the profits of the venture) the owner or master of the ship must pay each seaman on account, at the time when he lawfully leaves the ship at the end of his engagement, £2, or one-fourth of the balance of wages due to him, whichever is least, and the remainder of his wages shall be paid within two clear days (exclusive of any Sunday, fast day in Scotland, or bank holiday) after he so leaves the ship.¹

With the consent of the seaman, however, the final settlement of his wages may be left to a marine superintendent (officer similar to shipping commissioner in the United States), under regulations of the Board of Trade; and the receipt of the superintendent shall operate as if it were a regular release in a form approved by the Board of Trade. In case the seaman's wages or any part thereof are not duly paid or settled, unless the delay is due to the act or default of the seaman, or to any reasonable dispute as to liability, or to any other cause which is not the wrongful act or default of the owner or master, the seaman's wages shall continue to run and be payable until the time of the final settlement thereof.¹

In the case of home-trade ships, the master or owner must pay every seaman his wages within two days after the termination of the agreement with the crew, or at the time when the seaman is discharged, whichever first happens. If a master or owner fails without reasonable cause to make payment at that time, he is required to pay to the seaman a sum not exceeding the amount of two days' pay for each of the days during which payment is delayed beyond that time, but the sum payable shall not exceed 10 days' double pay, and any sum payable in this way may be recovered as wages.²

Where a seaman is discharged and the settlement of his wages completed before a superintendent, he must sign in the presence of the superintendent a release in a form approved by the Board of Trade of all claims in respect to the past voyage or engagement. The release must also be signed by the master or owner of the ship and attested by the superintendent, and when so signed and attested shall operate as a mutual discharge and settlement of all demands between the parties thereto in respect to the past voyage or engagement.³

It is provided, however, that a seaman may except from the release signed by him under section 136 of the act of 1894 any specified claim or demand against the master or owner of the ship, and a note of any claim or demand so excepted shall be entered upon the release. The release shall not operate as a discharge and settlement of any claim or demand so noted.⁴

Advances and allotments.—In regard to advance payments, the agreement between the master and the crew of British ships may contain a stipulation for the payment, to or on behalf of the seaman, conditioned on his going to sea in pursuance of the agreement, of a sum not exceeding the amount of one month's wages.⁵

Section 141 of the act of 1894 provides that the seaman may stipulate at the commencement of the voyage for the allotment of part of

¹ Merchant shipping act of 1894, sec. 134.

² Ibid., sec. 135.

⁴ Ibid., 1906, sec. 60.

⁵ Ibid., 1894, sec. 140.

his wages during his absence and that such stipulation must be inserted in the agreement between the crew and the master and should contain amounts and the times of payment.

This section also provided that after the seaman had signed the agreement, he might demand a stipulation as to the allotment of his wages by means of an allotment note. This provision was regarded, however, as practically a dead letter, and it was amended by section 61 of the merchant shipping act of 1906, with the view to enabling the seaman, without detriment, to demand in any case a stipulation for the allotment of his wages by means of an allotment note. Commenting upon the effect of section 61 of the act of 1906, S. D. Cole, Esq., in his commentary on that act says: ¹

The point of this section is that in effect it substitutes "shall" for "may." The principal act said that a seaman *may* stipulate for an allotment, but it was almost a dead letter, as it did not prevent an employer from refusing to engage seamen who wanted allotments. Section 61 says a seaman shall be asked *after* he has signed the agreement whether he wants an allotment, and, if he does, a stipulation to that effect *shall* be inserted, and *shall* be deemed to have been agreed to by the master. If a large amount accumulates, and is paid in a lump sum when a seaman is discharged, it is apt to be wasted, and section 61 will probably help to carry into effect the intention of the principal act that the family of a seaman should receive periodical payments during his absence.

In regard to times of payment under an allotment note, section 62 of the act of 1906 provides that payments shall begin at the expiration of one month from the date of the agreement with the crew and at the end of every subsequent month but shall be paid only in respect of wages earned before the date of payment. This section amended section 144 of the act of 1894, which permitted agreements for payments at a later date.

Because of doubts as to the correct interpretation of section 62 of the act of 1906, the merchant shipping (seamen's allotment) act of 1911 was passed, which provides as follows:

By agreement with the master an allotment note may be granted to a seaman providing for (a) payment at a period earlier than one month from the date of the agreement with the crew and at intervals more frequent than one month; (b) payment of a greater sum than one-half of the wages.

Payment for overtime work.—The prevailing rule in the British mercantile marine is that no reasonable performance of overtime work shall be refused. The actual amount of the overtime wages to be paid is a matter of contract and must be stipulated in the shipping articles.

GERMANY.

Mode and frequency of payment.—The principal German laws regarding the mode and frequency of payment of wages are contained in the Seemannsordnung of June 2, 1902, which contains the following provisions:

In the absence of any other agreement, wages shall not be demanded by the seaman until after the termination of the voyage or upon his discharge. If three months have elapsed since his engagement, he may, in a port in which the vessel is discharging all or the greater part of its cargo, demand payment of one-half of the wages due him. Likewise, the seaman is, after the expiration of a further period of three months from such date, entitled to payment of one-half of the wages earned since that time.²

The payment of the balance of wages due the seaman at the termination of his service must be made to him in person and, so far as the laws of foreign countries do not designate any other authority, before the seamen's office at the port of discharge or through its agency. This fact must be noted in the discharge articles.¹

With the consent of the seaman the payment may be made to a member of his family. Paying off can not take place in inns or taverns.¹

Before the commencement of the voyage, the master must open an account book, in which all advances and all payments on account of wages, as well as such earnest moneys as have been paid, are to be entered. In this account book, the seaman must give a receipt for each payment. The master is likewise obliged to give to each seaman who demands it a special wage book and to enter therein any payments made on account of the wages of the holder.²

An interesting provision of the German law is one which specifies that if the number of the crew decreases during the voyage and is not made up again, the amount of wages thus saved is, unless otherwise agreed, to be divided among the remaining seamen, in proportion to their respective wages. No claim to division exists, however, if the decrease of the crew is caused by desertion of a seaman who left no effects on board. If the number of the crew during the voyage is reduced by more than one-sixth, it is stipulated that the master, at the request of the remainder of the crew, must make up the deficiency so far as it is within his power.³

The German laws provide, in the absence of agreements to the contrary, for an automatic increase of wages of seamen after two years' service on vessels remaining abroad for more than two years. The regulations are as follows:⁴

(a) The ship's apprentice shall receive at the beginning of the third year the wages of an ordinary seaman as fixed by the ship's articles, or the average amount shown by them, and at the beginning of the fourth year the wages of an able seaman as fixed by the ship's articles.

(b) The ordinary seaman shall receive at the beginning of the third year the wages of an able seaman as fixed by the ship's articles and at the beginning of the fourth year an increase of one fifth.

(c) The remainder of the crew shall receive at the beginning of the third year an increase of one-fifth and at the beginning of the fourth year a further increase of one-fifth of the original amount of wages stated in the ship's articles.

Advances and allotments.—Under the German laws it is provided that in the absence of any agreement to the contrary the usage of the port in which the seaman is engaged determines to what extent advances or earnest money shall be made before the commencement of the voyage.⁵

Payment for overtime work.—The German laws specify that when the ship is in port or in roadsteads all work which has been performed in excess of 8 hours per day when in the Tropics and 10 hours elsewhere, and all Sunday and holiday work is to be paid for as overtime work. No distinction is to be made as to whether the man performs the extra work voluntarily or whether he has been compelled to do it, as, for example, on a working day when a pressing emergency has occurred, or on Sunday if the work could not possibly have been avoided, or is extra work done in obedience to the orders of his superior officers. The only exception to payment for overtime work is when it is performed in the care and service of the persons on board or for the safety of the ship when in imminent danger.⁶

The liability of the owner to pay for overtime work can not be limited by any contract; but, as a matter of course, it does not arise

in cases not covered by the limitations as to amount of Sunday work and the daily working time.

The amount paid for overtime on German vessels is a matter of mutual agreement. It must, however, be fixed at a certain rate per hour and be entered into the book containing the ship's articles¹ and also in the seaman's wage-account book.²

NORWAY.

Mode and frequency of payment.—The Norwegian laws provide that a seaman can demand that his wages be paid to him from time to time during the voyage, either in cash, if the ship is in a port, or by a draft on the owners, but the master shall always be entitled to retain, until the discharge of the seaman, one-half of the amount which the seaman has stipulated should be paid direct to himself.³

It is also provided that whenever in consequence of a reduction of the number of the crew during the voyage the work has to be performed by the remainder, the wages saved thereby, during the time the ship is at sea, are to be divided between the remaining seamen in proportion to the additional work performed by each. Such compensation can not be claimed, however, when the reduction of the crew is caused by desertion, if it is proved that the desertion has taken place under such circumstances that it might have been prevented by the remainder of the crew.⁴

The laws of Norway likewise specify that if a seaman is engaged for a fixed voyage and such voyage terminates, on account of changing the destination, at some place other than that at which the discharge of the seaman should have taken place in accordance with the terms of the agreement such seaman is entitled to have paid to him the costs of traveling and maintenance to that place at which he should have been discharged.⁵

If the wages have been agreed to at a fixed amount for the voyage and the voyage is so altered as to last longer than presumed at the time of hiring, the seamen are entitled to claim a proportional addition to their wages. Shortening of the voyage, on the other hand, does not affect their right to the payment in full of the stipulated wages. Furthermore, the seamen are entitled to additional wages not only for detention, which may be the result of the owner's or the master's voluntary actions, or for which these parties in one way or other are to blame, but also for such time as the ship may be compelled to lie idle on account of war, blockade, embargo, prohibition of exportation or importation, or detention by ice, or in a port of refuge entered for the purpose of repairing the ship, or for the sake of the cargo, and also for such time as the ship may be detained while loading or discharging over and above the stipulated lay days (days allowed for taking on or discharging cargo). Such additional wages shall not, however, be calculated for shorter periods than eight consecutive days, nor when the voyage has not been prolonged beyond the time presumed at the date of hiring.⁶

Advances and allotments.—No definite provisions are made in the Norwegian laws with respect to the allotment of wages of seamen,

but any special conditions with regard to the payment of wages may be covered in the agreement signed by the master and seaman.¹ No allotment note which has once been issued can be stopped before the termination of the services of the seaman without his consent unless an express stipulation to such effect has been made or the rest of the wages are not sufficient to cover the amount of compensation or fine the seaman may have incurred while in the service of the ship.²

Any advance wages paid must be duly entered and receipted for in the account book of the individual seaman.

Payment for overtime work.—Norwegian laws specify that if a master deems it absolutely necessary to employ the crew in loading or discharging on Sundays or days set apart as holy days in Norway, every seaman performing such work shall be entitled to an extra allowance of half day's pay for each period of two hours work commenced.³

For all overtime work, a seaman is allowed extra pay according to the conditions under which the overtime work is done. For loading and discharging in port, a seaman is entitled to 40 öre (10.7 cents) per hour overtime pay,⁴ and this amount appears to be the usual extra pay per hour for overtime. A seaman keeping night watch between 8 p. m. and 6 a. m., when in port, is entitled, at the master's option, to extra pay at the rate of 25 öre (6.7 cents) per hour or exemption from work for a corresponding number of hours.⁵

FRANCE.

Mode and frequency of payment.—According to the French laws, the payment of wages in whole or in part, must take place either in the presence of an administrator of the maritime inscription, who is charged with settling the accounts of the interested parties, or his agent. A record of the payments is made on the marine records by the maritime authorities.⁶

If the crew is paid by the month they are, in cases of the prolongation or shortening of a voyage, paid in proportion to the actual length of their service, regardless of the reason for the change in the length of the voyage.

If the crew is paid by the voyage and the ship is unloaded in a port which is nearer at hand than that which was designated by the terms of the charter, no reduction of wages is made.

If the voyage is prolonged for any cause except an act of God (force majeure), the wages are increased in proportion, and the same is true in case the voyage is delayed by acts of the captain or owner.⁷

On vessels operating in the over-seas trade (voyage au long cours) the wages due a seaman are payable whenever the vessel arrives at a French port or finishes its voyage, even though this port is not its home port. Unless arrangements are made to the contrary, the same is true of vessels operating in the international coasting trade (cabotage international), but this provision does not authorize the payment

¹ Maritime Law of Norway of July 29, 1893, sec. 71.

² Ibid., sec. 99.

³ Ibid., sec. 96.

⁴ Law of June 9, 1903, as amended by the law of Sept. 18, 1909, secs. 87-88.

of wages outside of France nor the extension for more than three months of the period intervening between two payments made in France.

On vessels operating in the national coasting trade (*cabotage national*), wages are paid monthly at the first port touched, except when there are agreements to the contrary. But this provision does not authorize the prolongation for more than three months of the period intervening since the last payment. In the case of every sailor who has separately disembarked in France before the expiration of the voyage, his wages are paid at the time of disembarkation.¹

If a vessel operating in the over-seas trade terminates its voyage in a port of Europe other than France, the French maritime authorities at this port are required to make a provisional reckoning of the wages due. This reckoning is viséd and forwarded by this local authority to the maritime authorities of the home port. The balance of the individual salaries after deductions have been made of the various advances or assignments or deposits, is returned to the local French authorities in the foreign port, in the form of vouchers or cash, contemplating payment to be made by the "*caisse des gens de mer*" (seaman's fund) to the sailor upon his return to France or to the person designated by him to collect the amounts which are due him.

The same arrangement is made when a vessel operating under the international coasting trade terminates its voyage in a foreign port. In the case of a sailor who has separately disembarked abroad before the termination of the voyage, wages due him are deposited with the "*caisse des gens de mer*," to be paid to him upon his return to France or to any person designated by him.²

In the case of engagements requiring an absence at sea for more than four months, at least two-thirds of the wages due for this particular period, after deduction has been made for any assignments, advances, or installments paid, are deposited every four months with the "*caisse des gens de mer*."

Advances and allotments.—No advance payment of wages can be made to a sailor except in the presence and under the supervision of the maritime authorities, and every advance payment made must be entered in the sailor's notebook.

Advance payments are not to be deducted from the amount due the sailor until after he has earned (a) three months' wages, in the case of vessels operating in the overseas trade, if the ship is a sailing vessel going around Cape Horn or Cape of Good Hope, (b) two months' wages in the case of sailing vessels that do not go beyond the capes; one month's wages for all other classes of trade, and 50 francs (\$9.65) in the case of fishing voyages other than "*grande pêche*."

If the advance money exceeds the sum thus fixed, the excess remains in the possession of the sailor under the title of engagement bounty or advance money forfeited. Nevertheless, advances may be permitted in excess of this maximum under the form of allotments.²

In no case under the French law may the sailor be paid in other than metallic money or paper money of legal tender, except that,

however, foreign money may be used at a determinate rate of exchange for the payment of wages abroad. In the absence of any agreement, payments may be made abroad in foreign money only after the exchange rate has been verified by the French authorities.¹

Every French sailor is required at the time of signing the contract, and if possible at the time for the beginning of each voyage, to state to the maritime authorities, both by declaration and by producing his sailor's notebook, or, if necessary, by other documents, the condition of his family and the home address of the persons for whom he is legally responsible. At the commencement of each voyage the sailor may stipulate that an allotment be made of his wages and profits, but only in favor of a person for whom he is legally responsible, and the sum total of the allotment may not in any case exceed two-thirds of the wages or profits due him. The total amount of the allotment, the names of the beneficiaries, and the times of payment are to be recorded in the muster roll of the ship.

After the voyage has started, it is possible for allotments to be made, subject to the same conditions, by sailors who did not take advantage of this privilege at the time of embarkation. Their request for such allotment is made to the captain, who must transmit the same without delay to the owner, and this fact must also be recorded in the muster roll by the maritime authorities.²

The owner is required to deposit in good season the sum total of the allotments either with the beneficiary of the allotment or with the "caisse des gens de mer."

Payment for overtime work.—The same principle which prevails in the mercantile marine of Great Britain, namely, that no reasonable performance of overtime shall be refused, exists also in the French mercantile marine. The French laws go further, however, and provide definitely that overtime work is to be paid for at the rate stipulated in the shipping articles or as fixed by custom.³

The actual amount to be paid for overtime work is generally fixed by contract, and, as stated above, must be set forth in the shipping articles. It is said, however, that these contracts are, as a rule, forced much above the minimum amount by the unions and syndicates which thrive in this class of labor in France.⁴

JAPAN.

Mode and frequency of payment.—There are, so far as can be discovered, no Japanese laws or regulations concerning the mode and frequency of payment of wages to Japanese crews.

Advances and allotments.—Apparently there are no Japanese laws or regulations on the subject of advances or allotments of wages of Japanese crews.

Payment for overtime work.—Apparently no specific provision is made in the maritime laws and regulations of Japan concerning the payment of wages for overtime work.

¹ Circulaire du 19 novembre, 1885.

² Arrêté ministériel du 22 mars, 1862.

9. PROVISIONS AND WATER FOR CREW.

UNITED STATES.

The laws of the United States provide a definite scale of provisions which are to be allowed and served out during the voyage to the crew of all vessels of the United States, except fishing and whaling vessels and yachts. Seamen have the option of accepting the fare which the owner may provide, but also possess the right at any time to demand the scale of provisions hereinafter given. This minimum scale of provisions is required to be inserted in every article of agreement, and shall not be changed except for substitutions as hereinafter provided for. A copy of the same must be posted in a conspicuous place in the galley and in the fore-castle of each vessel.¹

SCALE OF PROVISIONS TO BE ALLOWED AND SERVED OUT TO CREW DURING THE VOYAGE.

Provisions, &	Sun-day.	Mon-day.	Tues-day.	Wednes-day.	Thurs-day.	Fri-day.	Satur-day.
Water.....quarts.....	5	5	5	5	5	5	5
Biscuit.....pound.....	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Beef, salt.....do.....			$1\frac{1}{4}$		$1\frac{1}{4}$		$1\frac{1}{4}$
Pork, salt.....do.....		1		1		1	
Flour.....do.....	$\frac{1}{2}$		$\frac{1}{2}$		$\frac{1}{2}$		$\frac{1}{2}$
Canned meat.....do.....	1			1			
Fresh bread.....do.....	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$
Fish, dry, preserved, fresh.....do.....							
Potatoes or yams.....do.....	1	1	1	1	1	1	1
Canned tomatoes.....do.....	$\frac{1}{2}$					$\frac{1}{2}$	
Peas.....pint.....			$\frac{1}{3}$			$\frac{1}{3}$	
Beans.....do.....		$\frac{1}{3}$		$\frac{1}{3}$			$\frac{1}{3}$
Rice.....do.....							
Coffee (green berry).....ounce.....	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
Tea.....do.....	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
Sugar.....do.....	3	3	3	3	3	3	3
Molasses.....pint.....	$\frac{1}{2}$		$\frac{1}{2}$		$\frac{1}{2}$		$\frac{1}{2}$
Dried fruit.....ounces.....	3		3		3		3
Pickles.....pint.....		$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$	
Vinegar.....do.....			$\frac{1}{2}$				$\frac{1}{2}$
Corn meal.....ounces.....	4				4		
Onions.....do.....	4				4		
Lard.....do.....	1	1	1	1	1	1	1
Butter.....do.....	2	2	2	2	2	2	2

^a Mustard, pepper, and salt sufficient for seasoning.

Certain substitutes may lawfully be provided as follows: One pound of flour daily may be substituted for the daily ration of biscuit or fresh bread; 2 ounces of desiccated vegetables for 1 pound of potatoes or yams; 6 ounces of hominy, oatmeal or cracked wheat, or 2 ounces of tapioca, for 6 ounces of rice; 6 ounces of canned vegetables for one-half pound of canned tomatoes; one-eighth of an ounce of tea for three-fourths of an ounce of coffee; three-fourths of an ounce of coffee for one-eighth of an ounce of tea; 6 ounces of canned fruit for 3 ounces of dried fruit; one-half ounce of lime juice for daily ration of vinegar; 4 ounces of oatmeal or cracked wheat for one-half pint of corn meal; 2 ounces of pickled onions for 4 ounces of fresh onions.

When the vessel is in port and it is possible to obtain the same, $1\frac{1}{2}$ pounds of fresh meat must be substituted for the daily ration of salt and canned meat; one-half pound of green cabbage for one ration of canned tomatoes; one-half pound of fresh fruit for one ration of

dried fruit. Fresh fruit and vegetables must be served while in port, if obtainable.

In regard to complaints, section 4565 of the Revised Statutes provides as follows:

Any three or more of the crew of any merchant-vessel of the United States bound from a port in the United States to any foreign port, or being of the burden of 75 tons or upward, and bound from a port on the Atlantic to a port on the Pacific, or vice versa, may complain to any officer in command of any of the vessels of the United States Navy, or consular officer of the United States, or shipping commissioner, or chief officer of the customs, that the provisions or water for the use of the crew are, at any time, of bad quality, unfit for use, or deficient in quantity. Such officer shall thereupon examine the provisions or water, or cause them to be examined; and if, on examination, such provisions or water are found to be of bad quality and unfit for use, or to be deficient in quantity, the person making such examination shall certify the same in writing to the master of the ship. If such master does not thereupon provide other proper provisions or water, where the same can be had, in lieu of any so certified to be of a bad quality and unfit for use, or does not procure the requisite quantity of any so certified to be insufficient in quantity, or uses any provisions or water which have been so certified as aforesaid to be of bad quality and unfit for use, he shall, in every such case, be liable to a penalty of not more than \$100; and upon every such examination the officers making or directing the same shall enter a statement of the result of the examination in the log book, and shall send a report thereof to the district judge for the judicial district embracing the port to which such vessel is bound; and such report shall be received in evidence in any legal proceedings.

If, during the voyage, the allowance of any of the provisions which any seaman is entitled to is reduced except for any time during which such seaman willfully and without sufficient cause refuses or neglects to perform his duty, or is lawfully under confinement for misconduct either on board or on shore; or if it is shown that any of such provisions are, or have been during the voyage, bad in quality or unfit for use, the seaman must receive, by way of compensation for such reduction or bad quality, according to the time of its continuance, the following sums, to be paid to him in addition to and to be recoverable as wages: (1) If his allowance is reduced by any quantity not exceeding one-third of the quantity specified by law, a sum not exceeding 50 cents a day; (2) if his allowance is reduced by more than one-third of such quantity, a sum not exceeding \$1 a day; (3) in respect to bad quality, a sum not exceeding \$1 a day.¹

But if it is shown to the satisfaction of the court before which the case is tried that any provisions, the allowance of which has been reduced, could not be procured or supplied in sufficient quantities, or were unavoidably injured or lost, or if by reason of its innate qualities any article becomes unfit for use and that proper and equivalent substitutes were supplied in lieu thereof, the court must take such circumstances into consideration and must modify or refuse compensation, as the justice of the case may require.

GREAT BRITAIN.

Until the passing of the merchant shipping act of 1906 the details of a scale of provisions for seamen had never been fixed by act of Parliament. The act of 1894 did not go beyond generalities, and although the crew had had the right to lodge a complaint, there was no statutory schedule. This fact reduced greatly the number of formal complaints. At the present time, however, there is a detailed list of

things to be provided. The compulsory minimum scale provided by the act of 1906 is based on the scale recommended by the British Mercantile Marine Committee in 1903, although there are a number of points of difference. Every British merchant ship, except ships of less than 80 tons registered tonnage, exclusively employed in trading between different ports in the United Kingdom, is required to be provisioned according to the following scale:

Provisions.	Sun-day.	Mon-day.	Tues-day.	Wednes-day.	Thurs-day.	Friday.	Satur-day.	Week-ly.
Water.....quarts..	4	4	4	4	4	4	4	28
Soft bread.....pounds..	1	1	1	1	1	1	1	3
Biscuit.....do.....		1	1	1	1	1	1	4
Salt beef.....do.....	$\frac{1}{2}$		$1\frac{1}{2}$				$1\frac{1}{2}$	3
Salt pork.....do.....		1			1			2
Preserved meat.....do.....	$\frac{1}{2}$			$\frac{3}{4}$		$\frac{3}{4}$		$2\frac{1}{4}$
Fish.....do.....						$\frac{3}{4}$		$2\frac{1}{4}$
Potatoes.....do.....								6
Dried or compressed vegetables.....do.....								$1\frac{1}{2}$
Peas, split.....pint.....								$1\frac{1}{2}$
Peas, green.....do.....								$1\frac{1}{2}$
Calavales or Haricot beans.....do.....								$1\frac{1}{2}$
Flour.....pounds..	$\frac{1}{2}$		$\frac{1}{2}$	$\frac{1}{2}$			$\frac{1}{2}$	2
Rice.....do.....		$\frac{1}{4}$			$\frac{1}{4}$			$\frac{1}{2}$
Oatmeal.....ounces..			4				4	8
Tea.....do.....								$1\frac{1}{2}$
Coffee.....do.....								4
Sugar.....pounds..								$1\frac{1}{2}$
Milk, condensed.....do.....								$1\frac{1}{2}$
Butter.....do.....								$\frac{1}{2}$
Marmalade or jam.....do.....								1
Sirup or molasses.....do.....								$\frac{1}{2}$
Suet.....ounces..								4
Pickles.....pint.....								$\frac{1}{2}$
Dried fruits.....ounces..								5
Fine salt.....do.....								2
Mustard.....do.....								$\frac{1}{4}$
Pepper.....do.....								$\frac{1}{4}$
Curry powder.....do.....								$\frac{1}{4}$
Onions.....do.....		3						3

CONDITIONS AND EXCEPTIONS IN APPLYING SCALE.

1. In the issue of provisions for which a total weekly, and no daily amount is given the above scale shall be reasonably distributed throughout the week.

2. The issue of soft bread under the scale shall not be required (a) in a ship of less than 1,000 tons gross registered tonnage, or (b) if rough weather renders the making of bread impracticable. Where, however, soft bread is not issued, an equivalent amount of biscuit shall be issued instead.

3. An equal quantity of fish, up to an amount not exceeding three-quarters of a pound in any one week, may be substituted for preserved meat under the above scale.

The fish issued, whether under the scale or as a substitute, must be fresh fish, dried fish, or canned salmon or canned herrings.

4. Within the Tropics, $1\frac{1}{2}$ pound of preserved meat or 3 pounds of fresh meat may be substituted for 2 pounds of salt pork.

5. Fresh potatoes must be issued for at least the first eight weeks of the voyage in the case of every ship leaving a port within the home-trade limits at any time between the last day of September and the first day of May, and at any other time when they can be procured at a reasonable cost. When fresh potatoes are not so issued, an equal amount of yams or vegetables preserved in tins, or an equivalent amount of dried or compressed potatoes or dried or compressed vegetables, in the proportion of 1 pound to 6 pounds of fresh potatoes, must be issued in their place.

6. Fresh vegetables, or vegetables preserved in tins, may at any time be substituted for dried or compressed vegetables in the proportion of half a pound of fresh vegetables, or vegetables preserved in tins, to 1 ounce of dried or compressed vegetables.

7. A mixture of coffee and chicory, containing not less than 75 per cent of coffee, may at any time be substituted for coffee in the proportion of 5 parts of the mixture to 1 part of coffee.

8. The dried fruit issued under the above scale must be raisins, saltanas, currants, figs, or prunes.

9. The onions to be issued under the above scale must be fresh onions when in season; and when fresh onions are not in season, an equal amount of onions or vegetables preserved in tins, or an equivalent amount of dried or compressed onions or vegetables in the proportion of 1 ounce to half a pound of fresh onions must be issued.

10. In port (a) soft bread shall be issued in lieu of biscuit, and, (b) when procurable at a reasonable cost, a pound and a half of fresh meat and half a pound of fresh vegetables shall be issued daily, and when fresh meat and fresh vegetables are so issued salt and preserved meat and dried or compressed vegetables need not be issued.

11. The stokehold hands are to receive sufficient oatmeal and 1 quart of water extra daily while under steam.

Substitutes and equivalents—not to be used without reasonable cause:

Fresh meat.....	pounds..	1½	} To be considered equal.
Salt meat.....	do....	1	
Preserved meat.....	do....	¾	
Coffee.....	ounces..	½	} To be considered equal.
Cocoa.....	do....	½	
Tea.....	do....	¼	
Flour.....	pounds..	1	} To be considered equal.
Biscuit.....	do....	1	
Rice.....	do....	1	
Split peas.....	pints..	¾	} To be considered equal when issued with meat rations.
Flour.....	pounds..	¾	
Calavances or haricot beans.....	pints..	½	
Rice.....	pounds..	¾	} To be considered equal.
Marmalade.....	do....	1	
Jam.....	do....	1	
Butter.....	do....	½	} To be considered equal.
Mustard.....	do....		
Curry powder.....	do....		

As in the case of the United States, complaint may be made by three or more members of the crew of a British ship, if they consider that the provisions or water for the use of the crew are at any time of bad quality, unfit for use, or deficient in quantity, to an officer in command of a naval vessel, a British consular officer, a superintendent, or a chief officer of customs, and the officer may either examine the provisions or water complained of, or cause them to be examined. After such a complaint has been made, and an examination has been duly completed, if the master of the ship does not thereupon provide other proper provisions or water he is liable for each offense to a fine not to exceed £20.¹

The provisions of the British law regarding compensations to be made to the seaman in cases of bad quality or reduction of his food allowance coincide exactly with those of the United States except for the amount of compensation to be paid. If his allowance is reduced by not more than one-third of the quantity specified in the agreement, the compensation is to be a sum not to exceed 4 pence a day; if his allowance is reduced by more than a third of that quantity, not more than 8 pence a day; and if the quality of the provisions or water is bad, a sum not exceeding 1 shilling a day.²

GERMANY.

In general, the requirements as to minimum food scales on German vessels are left to the discretion of the various States of the Empire. Hamburg established a minimum scale in 1898, and Lubeck, Bremen,

Oldenburg, and Königsberg in 1899. In the absence of agreement, the minimum daily allowance of food and drink for each seaman is determined by the law of the home port, and in the absence of such law, then by the law of the port of registry. The issuance of more detailed regulations belongs, in general, to the governments of the several States and, if there are no home ports or ports of registry, to the imperial chancellor.¹

For seamen on vessels operating in the over-seas trade (*grosse Fahrt*) the following food scale is prescribed in the Medical Guide for Merchant Ships, issued by the Imperial Ministry of the Interior:²

It is the duty of the master to provide good provisions and the purest possible drinking water in sufficient quantities, as follows:

Meat.—A daily ration of 17.6 ounces of beef, or 13.2 ounces of pork, or 8.8 ounces of bacon, or 13.2 ounces of fish (not oftener than two days a week), or 13.2 ounces of canned meat. If the crew has more than 10 members, they receive as a body an extra ration of meat or fish.

Butter, lard, olive oil, or margarine of first quality.—A weekly ration of 17.6 ounces of butter, 17.6 ounces of lard, 1.1 pints of olive oil. In place of butter, 17.6 ounces of margarine of first quality. Vessels must carry a supply of butter or margarine for at least six months. As a substitute for butter, if there is a lack of lard and olive oil, an additional daily allowance of 8.8 ounces of meat or 4.4 ounces of bacon may be given per man.

Coffee, tea, water, and beer.—A weekly ration of from 5.3 to 7.9 ounces of raw or from 4.2 to 6.3 ounces of roasted coffee, 1.1 ounces of tea, and 1.6 gallons of water. If the crew exceed 10 in number, an extra ration of water must be provided.

Vessels leaving German ports must carry 52.8 quarts of beer per man. If no beer is given, each member of the crew must be given from 6.3 to 7.9 ounces of coffee instead of from 4.2 to 5.3 ounces.

Vegetables.—A weekly ration of 8.8 ounces of vegetables (potatoes, sauerkraut, or other vegetables). Also a sufficient supply of dried peas, beans, grits, and barley.

Bread.—A weekly ration of 9.4 pounds hard wheat or rye bread and flour.

Dried fruits.—A weekly ration of 5.3 ounces.

Sugar, etc.—Weekly ration of 8.8 ounces of sugar or sirup, and 0.5 pint of vinegar.

Lemon juice.—Three weeks after departure of the vessel 0.7 ounce of lemon juice must be served daily to each member of crew. It must be mixed with 0.7 ounce of sugar, a little rum, and about 0.8 pint of water.

These regulations provide that while the vessel is in port fresh food must be served at least twice each week and must consist not only of fresh meat and fish, but also, when possible, of fresh vegetables and fresh bread.³

In the case of an unusually long voyage or in the case of any casualties the master of the vessel is permitted to reduce rations or change the choice of food and drink. He must enter in the log book when, why, and in what way the reduction or change occurred and the seaman is entitled to an allowance equivalent to the privations suffered. The seaman's office, before which the discharge of the crew takes place, decides about such demand with the added reservation of recourse to law.⁴

The German laws also provide that if the ship's officer, or not less than three members of the crew make complaint before the seamen's office that the supplies of food and drink carried for the use of the crew is insufficient or spoiled, the seamen's office must cause the provisions to be examined as soon as possible under the direction of the specialist at hand and of the justice of the peace resident in

¹ Seemannsordnung of June 2, 1902, sec. 56, clause 1.

² Anleitung zur Gesundheitspflege auf Kauffahrtschiffen (5th edition), 1913, pp. 27, 310-311.

³ Ibid., pp. 310-311.

⁴ Seemannsordnung of June 2, 1902, sec. 57.

that locality. The result of this examination must be entered in the log book. If the complaint proves to be well founded the seamen's office must provide the necessary remedy.¹

NORWAY.

The Norwegian laws contain elaborate and detailed regulations respecting the amount of food and water to be served to seamen on Norwegian vessels. The laws require that all foreign-going vessels have on board a stock of provisions, such as biscuits, and flour for making bread, butter, meat peas or barley, sugar, coffee, and fresh water for cooking purposes, sufficient to last for periods as follows:²

The following table shows the stock of provisions to be carried by sailing ships:

Sailing ships.

Duration of voyage.	Stock of provisions. ^a	Duration of voyage.	Stock of provisions. ^a
1 week.....	4 weeks.	2½ months.....	5 months.
2 weeks.....	6 weeks.	3 months.....	6 months.
3 weeks.....	8 weeks.	4 months.....	7 months.
1 month.....	2½ months.	5 months.....	8 months.
1½ months.....	3 months.	6 months.....	9 months.
2 months.....	4 months.		

^a Minimum stock, 2 weeks.

Steamers.—A steamer is required to provision for a period twice the time in which it is estimated it will take the steamer to make the particular passage from port to port. In no case can it provision for less than one week.²

The food or allowance per head on Norwegian vessels must be as follows:

- Bread, as much as may be consumed; the calculation should be:

Of biscuits, daily.....	ounces..	17. 6
Of soft bread, daily.....	do....	26. 5
- Salt meat, including bone, per day when served out.....do.... 22. 0
- Fresh meat, including bone, per day when served out.....do.... 21. 2

Or preserved meat, per day when served out.....	do....	12. 3
Or preserved meat.....	do....	8. 8
And salt meat.....	do....	7. 1
Or dried meat when served out.....	do....	14. 1
- Pork, salt or fresh, as addition to salt meat, preserved meat or dried meat per day when served out.....ounces.. 3. 5
- Fish, dry salted, per day when served out.....do.... 12. 3

Or dried.....	do....	10. 6
Or fresh, or salted in barrel.....	do....	17. 6
Or preserved fish.....	do....	12. 3
- Natural butter or margarine, weekly.....do.... 17. 6

Or, in want thereof, olive oil, or a sufficiency of fruit jams or marmalade in conjunction with half of the above-named quantities of butter or olive oil.....	quart..	. 5
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- Sugar, weekly (butter or sugar used in preparing food is not included in these quantities).....ounces.. 12. 3
- Coffee, raw, weekly.....do.... 7. 9
- Tea, weekly (tea for relieving boiled water not included herein).....do.... 0. 9
- Wheat flour, weekly.....do.... 35. 3
- Potatoes or yams or sweet potatoes or other edible roots or vegetables suitable as substitutes or equivalents for potatoes, fresh, weekly.....ounces.. 105. 8

Dried or otherwise preserved potatoes, weekly, in want thereof.....	do....	10. 6
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¹ Sesmannsordnung of June 2, 1902, sec. 58.

² Ordinance respecting regulations for provisions for the Norwegian mercantile marine, Nov. 24, 1905.

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12. Vegetables, fresh or pickled, weekly	ounces..	35. 3
Or preserved, in want thereof, weekly.....	do....	10. 6
Or dried.....	do....	3. 5
13. Dried fruit for cooking purposes, weekly.....	do....	3. 5
Or jam (south of 33° N. lat. and in the Arctic seas, respectively, 5.3 and 10.6 ounces).....	ounces..	7. 1
14. Condensed milk, for coffee, per head, weekly (to be added by the steward).....	ounces..	5. 3
Herein not included what is used in preparing food. If milk can not be had at a reasonable price, the weekly sugar allowance may be increased by.....		
	ounces..	3. 5
15. Peas, beans, barley, rice, weekly, of each kind	quart..	0. 4
If oatmeal porridge is served out for breakfast daily, besides coffee and bread and butter, about 17.6 ounces oatmeal per head per week is required.		
16. Salt, mustard, pepper, vinegar necessary for use in preparing food. Besides this, a suitable quantity is served out to the crew, especially of vinegar if lime juice is not served out.		
17. Lime juice to be served out daily if the fresh potatoes, yams, etc., run short or spoil, or if scurvy or beriberilike diseases appear. In this case, there must be served out daily per head, two tablespoonfuls (1.1 ounces), with a suitable amount of sugar, in 0.26 quart of water at dinner. For this purpose, about 0.26 quart per head per week is required.		
18. Water, weekly, for cooking purposes and for drinking	gallons..	9. 2
Herein is not included what is used by firemen and engineers on duty. At their disposal is to be placed drinking water in which coarse oatmeal has been mixed, 1 tablespoonful to 1.1 quarts of water.		

FRANCE.

The French laws require that the food furnished to seamen must be wholesome, of good quality, of sufficient quantity, and of a kind appropriate for the voyage which is being undertaken. The composition of the rations provided must be equivalent at least to that furnished to seamen in the French Navy. A table of equivalents, established by ministerial decree, and a definite food scale must both be posted in a permanent fashion in the mess rooms of the crew. The personnel of the deck department, the engine room, and the general service designate, each one in turn, one of their members to verify at each distribution the quantity of food and water distributed, and, if need be, the quality.¹ On every French ship, where the provisions for the crew are furnished by the owner, there must be a skilled cook, at least 18 years of age. If the crew contains over 20 men, the cook may not be taken away from his duties to perform other services.²

The composition of the rations served to each person in the crew of a French merchant ship or fishing ship or pleasure yacht is determined according to the conditions of the following table³:

¹ Law of Apr. 17, 1907, sec. 31.

² Decree of Sept. 3, 1913, art. 7.

³ Arrêté Relatif à L'Alimentation des Equipages des Navires, de Commerce July 20, 1910.

A. I. The daily rations for each person on board must comprise the following articles:

Provisions.	Daily rations measured in—			
	Grams.	Ounces.	Liters.	Pints.
Bread.....	800	28.2		
Or biscuit.....	600	21.2		
Coffee:				
Unroasted.....	25	.9		
Roasted.....	20	.7		
Sugar.....	30	1.1		
Lard.....	40	1.4		
Olive oil, or salt butter.....	40	1.4		
Salt.....	16	.6		
Pepper and spices.....	.05	.002		
Mustard or pickles.....	6	.2		
Wine:				
Sailors.....			0.5	1.1
Apprentices or novices below age of 17 years.....			.3	.6
Or, instead of wine, cider or beer:				
Sailors.....			1.5	3.2
Apprentices or novices below age of 17 years.....			1.0	2.1
Vinegar.....			.008	.2

II. The daily ration must also comprise one article from each of the following groups of provisions:

Provisions.	Daily ration.		Ration for single meal.	
	Grams.	Ounces.	Grams.	Ounces.
Group A:				
Fresh meat.....	400	14.1	200	7.1
Fresh fish.....	400	14.1	200	7.1
Canned beef.....	250	8.8	125	4.4
Salt pork.....	300	10.6	150	5.3
Salt or dried codfish.....	250	8.8	125	4.4
Smoked ham.....	200	7.1	100	3.5
Smoked herring.....	160	5.6	80	2.8
Sardines in oil.....	160	5.6	80	2.8
Pickled tunny fish.....	160	5.6	80	2.8
Group B:				
Green vegetables not prepared.....	1,000	35.3	500	17.6
Raw potatoes.....	800	28.2	400	14.1
Desiccated vegetables.....	160	5.6	80	2.8
Sauerkraut.....	700	24.7	350	12.3
Dried vegetables (fayols, lentils, split peas).....	200	7.1	100	3.5
Rice.....	200	7.1	100	3.5
Italian paste.....	240	8.5	120	4.2
Dutch cheese.....	160	5.6	80	2.8
Salt butter.....	100	3.6	50	1.8
Dried fruits.....	250	8.8	125	4.4

NOTE.—The provisions mentioned in Articles I and II above are divided between two meals. In order to vary the diet as much as possible it is desirable to make up the day's rations of different provisions for each meal, chosen from each one of the above indicated categories.

B. Whenever the boilers are in use aboard steamships there must be given, in addition to the normal rations provided for above, to each officer, mate, or sailor who is engaged in service in the boiler room, either tending the fires or drawing the ashes the following rations:

1. For each watch of 4 or 6 hours duration at least 0.5 pint (25 centiliters) of wine and 3.5 ounces of bread (or 2.4 ounces of biscuit). Moreover, whenever the length of the watch is in excess of 6 hours for men holding the second night watch and for those finishing the first, a supplementary night luncheon which is composed of 0.25 pint (12.5 centiliters) of wine, 5.3 ounces of bread and 2.1 ounces of canned beef.

2. Each day, a drink which is hygienically prepared from drinking water, and for the preparation of which there is allowed at least 0.35 ounce of unroasted coffee or 0.28 ounce of roasted coffee and at least 0.42 ounce of sugar. Whenever the boilers on board the ship are in use, a glass of water must be given to the crew for the preparation of the drink.

of machinery other than the motive machinery, are in operation the above mentioned allowance of 0.5 pint (25 centiliters) of wine and 3.5 ounces of bread (or 2.4 ounces of biscuit) is to be distributed daily and not by watches; but the same hygienically prepared drink is to be allowed in both cases. The captain may permit the supplementary allowances above indicated to be given to the men in the watch working at the electric switchboard, whenever this apparatus is situated in a compartment where the temperature is very high. The rules of the present article do not apply to the engine room personnel serving aboard steam cutters.

C. So far as possible salt provisions shall not be distributed more than four times a week.

D. Aboard ships on which there is a doctor, the menu for each week must previously be submitted to him in order that he may suggest any changes which he deems necessary to the captain, who must make these changes in the menu in so far as the material resources of the ship permit.

E. Aboard ships which have an oven and upon which there is carried a cook, fresh bread must be baked and distributed at least three times a week. At least 26.1 ounces (740 grams) of flour must be allowed for each kilogram of bread, except in cases where because of exceptional circumstances, this quantity is recognized as being insufficient.

F. When extraordinary or specially difficult work has been done on board, or when overtime work amounts to more than 3 hours in each 24, there is to be allotted to each member of the crew who has performed the above-mentioned work a supplementary ration of 3.5 ounces (100 grams) of bread (or 2.4 ounces of biscuit), 5.1 ounces of meat or fish (fresh or preserved), and 0.5 pint (25 centiliters) of wine.

JAPAN.

The provisions of the Japanese laws respecting the amounts of food and water which must be served to the seamen on Japanese vessels stipulate that the contract regarding the food and water must be stated in the agreement and must receive the sanction of the maritime authorities at the time of the engagement.¹

10. QUARTERS FOR THE CREW.

UNITED STATES.

Sleeping quarters.—Under the act of March 4, 1915, all new merchant vessels of the United States (the construction of which has begun since Mar. 4, 1915) except yachts, pilot boats, or vessels of less than 100 tons register are required to provide for the crew a place which shall contain not less than 120 cubic feet of space, with a floor area of not less than 16 square feet, for each seaman or apprentice. It is also provided that each seaman must have a separate berth and not more than one berth may be placed above the other.²

Formerly, under section 2 of the act of March 3, 1897, the requirement was that the quarters for crews of seagoing vessels of the United States, except fishing vessels, yachts, pilot boats, and all vessels under 200 tons registry, should be of sufficient size to afford each seaman or apprentice a space of at least 72 cubic feet, with a floor area of at least 12 square feet.

The act of March 3, 1897, applied to all merchant vessels except seagoing sailing vessels built or rebuilt after June 30, 1898, which were to provide crew's quarters having at least 100 cubic feet of space, with a floor area of not less than 16 square feet, for each seaman or apprentice.

¹ Report of British Board of Trade Committee on the Mercantile Marine, 1903, Appendix A, No. 20, p. 56.

² Act of Mar. 4, 1915, sec. 6.

It will be noted that section 6 of the act of March 4, 1915, increased the space allowed for crew's quarters on new steamships from 72 cubic feet, with 12 square feet of floor space, and on new sailing vessels from 100 cubic feet, with 16 square feet of floor space, to 120 cubic feet, with 16 square feet of floor space.

While the earlier act applied only to seagoing vessels, the later act applies to all merchant vessels of the United States, which of course includes those navigating the Great Lakes and the smaller lakes, bays, and sounds. Another difference might be noted, namely, that while the earlier act exempted, in addition to fishing vessels, yachts, and pilots, all vessels of less than 200 tons register, the later act exempts only those of less than 100 tons register.

The requirements of the act of March 4, 1915, as to separate berths for each seaman and as to the placing of not more than one berth above the other, are new.

In all cases each place or lodging must be securely constructed, properly lighted, drained, heated, and ventilated, properly protected from weather and sea, and, as far as practicable, properly shut off and protected from effluvium of cargo or bilge water. Every such crew space must be kept free from goods or stores which are not the personal property of the crew occupying these spaces during the voyage.¹

While the act of March 3, 1897, contained no requirements as to crew's quarters on vessels on the Great Lakes and the smaller lakes, bays, and sounds, it did have a provision concerning boats operating on the Mississippi and its tributaries. This requirement was reenacted in slightly modified form in section 6 of the act of March 4, 1915, which provides as follows:

Every steamboat of the United States plying upon the Mississippi River or its tributaries is required to furnish an appropriate place for the crew, which must conform to the above-named requirements so far as they are applicable thereto, by providing sleeping room in the engine room of such steamboat, properly protected from the cold, wind, and rain by means of suitable awnings or screens on either side of the guards or sides, and forward, reaching from the boiler deck to the lower or main deck, under the direction and approval of the Supervising Inspector General of Steam Vessels, and must be properly heated.

Washing places.—The act of March 4, 1915, introduced an entirely new statutory requirement in providing, in section 6, that all merchant vessels built after the passage of the act and having more than 10 men on deck shall have at least one light, clean, and properly heated and ventilated washing place for the deck crew and an additional and separate washing place for the fireroom and engine-room men if their number exceeds 10.

The washing place for the men of the deck department must have at least one "washing outfit" for every two men of the watch. The place set apart for the men of the engine department must be large enough to accommodate at least one-sixth of these men at the same time, and must have a supply of hot and cold water and a sufficient number of wash basins, sinks, and shower baths.

Toilet accommodations.—There are no laws or regulations regarding toilet accommodations for the crews of vessels of the United States.

¹ Originally required in sec. 2 of the act of Mar. 3, 1897, and reenacted in sec. 6 of the act of Mar. 4, 1915.

GREAT BRITAIN.

Sleeping quarters.—The requirements as to crews' quarters on British vessels are well summarized in the following extracts from the instructions issued by the Board of Trade in 1913:

• Every place in any British ship occupied by seamen or apprentices and appropriated to their use must have a prescribed amount of superficial and cubic space for each seaman and apprentice; it must be available for the proper accommodation of the men; it must be securely constructed; properly lighted and ventilated; properly protected from weather and sea; and properly protected from effluvium.¹

Section 210 of the merchant shipping act, 1894, provides that there must be for each man a space of not less than 72 cubic feet and 12 superficial feet. Section 64 of the merchant shipping act, 1906, which came into operation on June 1, 1907, increases this amount in the case of new ships to 120 cubic feet and 25 superficial feet.

This latter section does not apply (1) to ships registered before December 21, 1906; (2) to ships which were in course of construction on January 1, 1907; (3) to ships of not more than 300 tons net; or (4) to any fishing boat within the meaning of Part IV of the 1894 act; and the section does not require any additional space to be given in the case of places occupied solely by lascars and appropriated to their use.

These five classes of cases will continue to be governed by the act of 1894.

Under the act of 1906 the surveyor may take into account the space occupied by any mess rooms, bathrooms, or washing places appropriated exclusively to the use of the seamen and apprentices, so, however, that the space in any place appropriated to the use of seamen and apprentices in which they sleep is not less than 72 cubic feet and 12 superficial feet for each seaman and apprentice.²

These requirements apply to all British ships, "except ships belonging to the three general lighthouse authorities, pleasure yachts, and fishing boats exclusively employed in fishing on the coasts of the United Kingdom."³

The British laws require every space appropriated to the use of the crew to be properly lighted. To insure this under ordinary conditions, it is generally considered necessary to have sufficient provision for natural light, when the ship is new and the paint clean, even if one-third of it be closed, to make it possible to read the print of an ordinary newspaper in any part of the space. This standard is now regarded as a minimum for British vessels and is strictly observed when surveying the spaces of all new vessels.⁴

The importance of proper ventilation is recognized by British laws, although no hard and fast rule is laid down as to the system of ventilation to be adopted. It is stipulated, however, that there shall be not less than two ventilators, one serving as an inlet for the admission of fresh air, and the other as an outlet for the escape of impure air, whether the accommodation consists of a forecastle, poop, round-house, side house, or cabin.⁵

Washing places.—The British laws do not expressly require that washing places shall be provided on British vessels. The Board of Trade instructions, referred to above, provide merely that spaces devoted to bathrooms and washing places shall be included in the computation of space devoted to crew's quarters.⁶

Toilet accommodations.—The Board of Trade instructions as to the survey of master's and crew spaces, issued in 1913, contained the

¹ Board of Trade Instructions as to Survey of Master's and Crew Spaces (1913), sec. 3.

² Ibid., sec. 9.

³ Ibid., sec. 7.

⁴ Ibid., sec. 16.

⁵ Ibid., sec. 17.

⁶ Ibid., secs. 9, 11, 25.

following regulations regarding toilet accommodations on British vessels:¹

The number of privies or seats required should be in the proportion of one for every 10 men certified for, exclusive of officers, subject to the following modifications:

In cases where the crew spaces are certified for more than 100 men exclusive of officers, there should be 10 privies or seats for the first 100 and for any additional number, exclusive of officers, the privies or seats should be increased at the rate of 4 per cent.

In small vessels where the total number certified for, inclusive of officers, falls short of 20 men, two privies or seats will be considered sufficient; and when less than 10 men are certified for, inclusive of officers, only one privy will be required.

In the case of trough closets such as are usually provided for lascar crews, with no seats fitted, a linear measurement of 18 inches, clear trough opening, may be accepted as equivalent to one privy or seat.

All seating should be substantial and should be made either easily removable or hinged to facilitate cleansing.

The soil pipe should, in no case, be less than 4 inches diameter in the clear and storm valves should always be fitted.

Arrangements must be made for properly flushing trough w. c.'s, which may be effected either by connections to a sanitary cistern, to fire or deck services, or by other satisfactory means.

For single-seat water-closets as usually provided for officers, china pans with flushing cisterns should be fitted.

The single-seat type of water-closet is strongly recommended for use in all cases.

The surveyor should see that the privies are so built, fitted, and situated that no unpleasant smell from them will enter the places occupied by the crew.

All water-closets should be ventilated direct to the open air.

Care should be taken that when entered from a passageway leading to crew spaces the water-closet door is solid and closely fitted and the passageway suitably ventilated. In steel vessels the bulkheads of the crew's water-closets should in all cases be of steel, but if the water-closet (or combined bathroom and water-closet) is for the use of the officers or the master, and is either entered from or adjoins a passageway leading to the sleeping and messing accommodation, only those of its bulkheads which divide it from adjoining living spaces are required to be of steel; and those next the passageway, if substantially constructed of well-seasoned material and virtually gas-tight, may be accepted when built of wood.

If a water-closet, or combined bathroom and water-closet, opens direct into a space appropriated for the master, officers, or crew, no deduction can be allowed for either space so situated, and surveyors should use their influence, even though no deduction is claimed in respect of the spaces, to discourage such an objectionable arrangement. The owner's attention should be drawn to the matter in the usual way by issuing a Form Surveys 70.

In small vessels with low bulwarks it may be difficult to arrange an inclosed privy, such as may be easily fitted in larger vessels; but a strong seat with a shoot or pan passing over or through the ship's side may be fitted, and this should be protected from the weather by a fixed or folding wooden or iron hood with suitable flaps or doors to inclose the space when occupied.

GERMANY.

Sleeping quarters.—Regulations concerning the accommodations for the crews of German vessels were issued on July 2, 1905,² in conformity with the provisions of paragraph 2 of section 56 of the Seemannsordnung. In all merchant ships of more than 400 cubic meters (140 registered tons) gross measurement, with the exception of vessels engaged in fishing on the high seas, the size of the sleeping room must be sufficient to provide at least 3.5 cubic meters (123.6 cubic feet) of air space for every seaman, and the following provisions also apply:

(1) Rooms on the top deck, or other rooms must have sufficient ventilation under all conditions and must have at least 3 cubic meters (105.9 cubic feet) of air space for

¹ Board of Trade Instructions as to Survey of Master's and Crew Spaces (1913), sec. 24.

² Bekanntmachung betreffend die Logis, Wasch und Baderäume sowie die Aborte für die Besatzung.

each seaman. In computing air space, a deduction from the gross cubic capacity of the room is to be made for permanent parts of the ship found there. In every sleeping room there must be at least 1.5 square meters (16.1 square feet) of floor space for each seaman. This space may be reduced to 1.25 square meters (13.5 square feet) in cases where a special mess room has been installed in the sleeping room. In computing the area of floor space, measurement is to be made only to the inner edge of the beams (spanden). Where the sleeping quarters have sloping walls, the cubic contents may be determined by multiplying the horizontal cross section of the room by one-half of the height.

(2) The mean height of the quarters must be at least 2 meters (6.6 feet), except in the case of vessels of not more than 2,000 cubic meters (700 registered tons) gross measurement, for which at least 1.8 meters (5.9 feet) height is required.

(3) The sleeping quarters must be protected as far as possible from the weather, foul smells, heat of adjoining rooms, and other burdensome conditions.

(4) Approaches to the hold must not lead through the sleeping quarters. Rooms for ships stores with the exception of the cable room may be reached through the sleeping quarters at night, only in cases of necessity. Every sleeping room must be exposed to the daylight to a sufficient degree, and in dark weather and at night must be sufficiently lighted by artificial means.

(5) The middle part of the sleeping room must be so far as possible free from shafts, tunnels, ventilators, and other appliances.

(6) The floor of the sleeping room must be of wood or provided with a covering that is thick, easily kept clean, and a poor conductor of heat. The walls and ceiling of the sleeping room must be painted with a bright oil paint. Exposed iron ceilings must be provided with coverings and protected against dripping water.

(7) Every seaman is to be provided with a berth for his exclusive use. Double berths without partitions are not permitted. The length of the berth must not be less than 1.83 meters (6 feet), and the average width not less than 0.6 of a meter (2 feet). The space between the floor and the lowest berths must be at least 25 centimeters (9.8 inches), but it can be as low as 15 centimeters (5.9 inches) if three berths are placed one above the other, are made of iron, and are easily moved. The space between the berths lying one above the other, as well as the space between the bed of the upper berth and the ceiling of the room must be at least 75 centimeters (2.5 feet). It is not permitted to have more than three berths one above the other. The bedding of each berth must be thoroughly aired and cleaned as often as possible and, whenever required, disinfected.

(8) In addition to the natural ventilation by windows and doors, there should be provided in each room an appliance by which a sufficient renewal and movement of air can be had when the windows are closed.

(9) The lower end of the air shafts that may be in the room must be so arranged that the cold stream of air shall not blow directly on the berths.

(10) In cold weather the sleeping quarters are to be adequately heated. Iron stoves are to be surrounded by a removable iron screen or sheathing, which is placed at least 5 centimeters (1.9 inches) from the stove and has some large openings at the bottom.

(11) The tables, benches, closets, and other arrangements must satisfy reasonable requirements. In every sleeping room there must be tables and seats which shall provide mess accommodations for at least one-half of the crew, provided a suitable mess room or other accommodation is not provided in a space apart from the sleeping quarters. There should be at least one cuspidor in each sleeping room and the same must be cleaned daily.

(12) The number of persons accommodated in each sleeping room must be indicated clearly over the door of the room.

(13) Sleeping quarters are to be kept in the best possible condition.

Washing places.—Ample provision of wash rooms and bathrooms must be made for the crews of German vessels. Every merchant ship must provide the crew with bathing accommodations and facilities for washing their clothes.¹

On all steamers carrying more than 20 in the crew there must be at least one bright, clean, wash room, and the same must be provided with sufficient washing places, so that there shall be at least one such place for every two men on watch, in case there are not special washing places for each member of the crew. The wash room

¹ Schiffsärztliche Anweisung betreffend die Logis, Wasch und Badräume sowie die Aborte für die Schiffe.

must be heated except in the case of cargo steamers not provided with steam heat. The wash places may be installed in the same room as the toilets so far as the arrangement and the care of the toilets do not offend the sense of decency.¹

The crew in the engine department, if they number more than 10, shall have a special wash room which shall, if possible, be so situated that it can be reached by the engine crew on their way from the boiler and bunker rooms. This room must be large enough to accommodate at one time at least one-sixth of the engine crew. It must be provided with water pipes and shower baths (one for every four of the total number of persons using the room at one time) and with a sufficient number of washbasins.¹

On all steamers which are provided with warm shower baths for the passengers, similar provisions must be made for the crew, with the necessary arrangements for preventing the scalding, as far as possible, of persons using the bath. It is provided that on all steamers engaged in "mittlere Fahrt" or "grosse Fahrt" provision shall be made for soft-water bathing at least twice a week. Boats engaged in fishing on the high seas are exempt from this provision on journeys in north European waters, however. The wash rooms and bathrooms are to be cleaned daily.²

Toilet accommodations.—The decree of July 2, 1905, regarding sleeping quarters, wash and bath rooms, and toilets for the crews of German merchant ships, contains the following regulations concerning toilet accommodations:²

On all merchant ships except sailing vessels of not more than 400 cubic meters (140 register tons) gross measurement, toilets in detached rooms and urinals shall be provided for the crew. The urinals may be placed in the toilet rooms.

Seagoing lighters must have one substantial and fixed toilet.

A special toilet room must be provided for the deck watch if their number exceeds 10.

The toilet rooms must be separated from the sleeping quarters by at least one or more rooms or by odor-proof partitions without doors and shall be so located that the toilet seats are not over the water.

The toilet rooms must be provided with satisfactory ventilating appliances and shall be sufficiently exposed to daylight. The walls and ceiling must be painted with a bright oil paint and the floor so constructed as to be air and water proof.

The toilets must be provided with seats at least 50 centimeters (about 20 inches) in width. There shall be at least one seat for every 25 members of the crew in crews of not more than 100; for crews of from 100 to 200, at least one extra seat for every additional 33 seamen; and for crews of more than 200, one extra seat for each additional 50 members of the crew. In case of non-European crews the equipment of seats can be done away with so far as the crew is not accustomed to their use.

Sailing ships of not more than 400 cubic meters (140 register tons) gross measurement must be provided with one toilet arrangement, which may be movable.

Toilets and urinals must be cleaned daily.

NORWAY.

Sleeping quarters.—The provisions of the Norwegian laws respecting accommodations for the crews of Norwegian vessels are similar to those of the United States and Great Britain. The requirement is that every Norwegian vessel of 200 gross tons register or more shall provide quarters for the crew which have a cubic capacity of not less than 3.4 cubic meters (120 English cubic feet) and a floor space of

¹ Bekanntmachung, betreffend die Logis, Wasch und Baderäume sowie die Aborte für die Schiffsmannschaft auf Kauffahrteischiffen, vom 2 Juli, 1905, secs. 4 and 5.

not less than 1.6 square meters (17.2 square feet) per person. Space occupied by bunks, tables, and benches but not by cupboards or other closed-in spaces may be counted in the minimum.

It is further provided that each member of the crew must have a bunk to himself which shall be not less than 1.90 meters (6.2 feet) in length, and 0.60 meter (2 feet) in width.¹

The Merchant Marine Department is authorized to order any alterations or improvements in the crew's quarters which it deems necessary, if the capacity is considered insufficient or the accommodations otherwise unsuitable. No specific reference is made in the Norwegian laws to the lighting, ventilating, or arrangement of bunks. It is required, however, that "above the door of each sleeping berth for the crew, the number of hands which it is intended to accommodate shall be distinctly marked."²

There are no requirements in the Norwegian laws for maintaining mess rooms separate from sleeping quarters, the space for such accommodations being included in the total space which must be allotted for the seamen, as the law states that "when a separate mess room has been fitted for the crew, in immediate connection with the sleeping quarters, a deduction of up to 25 per cent may be allowed in the above minimum cubic capacity and floor space of the sleeping quarters."

Washing places and toilet accommodations.—Apparently, the laws and regulations of Norway contain no requirements as to washing places and toilet accommodations for the crews of Norwegian vessels.

FRANCE.

Sleeping quarters.—The provisions of the French laws respecting accommodations for the crews of French vessels are in many respects similar to those of the United States, Great Britain, and Germany. The quarters assigned to the crews of French vessels must represent a minimum, exclusive of water-closets and urinals, of 3.5 cubic meters (123.6 cubic feet), with a superficial surface on the floor of 1.5 square meters (16.1 square feet) per person.³

The spaces occupied by beds, bunks, tables, and chairs are not deducted, but the quarters used specially for sleeping purposes must represent at least a volume of 2.15 cubic meters (75.9 cubic feet) and a horizontal surface of 1.15 square meters (12.4 square feet) per person.³

The maximum number of men who may be lodged in each sleeping compartment must be marked on the door or hatchway of the compartment.³

The height of the crew spaces measured from the surface of the deck beams in the floor to the surface of the beams in the ceiling may not be less than 1.83 meters (6 feet).⁴

The floors, ceilings, and walls of the spaces assigned to the crew must be water-tight. If the floor of the sleeping quarters of the crew is made of wood or has a covering of wood, its seams must be calked; if it is made of sheet iron, it must be covered with a coating

¹ Law concerning the public supervision of the seaworthiness of ships of June 9, 1903, as amended by the Law of Sept. 18, 1909, sec. 43.

² *Ibid.*, sec. 44.

³ Décret du 21 septembre 1908, sec. 5.

or with a substance that is a poor conductor of heat and is easy to keep in repair. When the floor of the sleeping quarters assigned to the crew is made of a deck not covered by sheet iron, the upper surface of this deck must be covered with a border of wood. The under surface of sheet-iron decks, whether covered or not, must not be sheathed unless the sheathing is applied directly to the iron.¹

Separate spaces having distinct entrances are reserved for members of the crew of African or Asiatic origin. They must contain sleeping accommodations according to the usage in the country of origin of such persons, and must represent a minimum volume of air of 2.15 cubic meters (75.9 cubic feet) per man.²

Every member of the crew must be provided with either a hammock or a bunk for his exclusive use. The hammocks must be swung at a distance of at least 1 meter (3.28 feet) from the partitions and from each other.²

The bunks and hammocks are furnished either by the owner of the vessel or the crew, according to the terms of the engagement, with at least a mattress and two blankets. All bedding must be renewed every year or whenever there has been a sickness on board. The individual bedding belonging to the crew is not allowed to be brought on board before having been thoroughly washed.³

The bunks must be at least 1.83 meters (6 feet) long and 0.6 meter (2 feet) wide. It is also provided that in no case may more than two bunks be superposed, and bunks without an independent access are forbidden. In the case of bunks placed one above the other, the bottom of the lower bunk must be at least 30 centimeters (about 12 inches) above the floor, and the bottom of the upper bunk must be halfway between the bottom of the lower bunk and the deck above. No bunk must be located underneath air ventilators or cable bitts attached directly to a sheet-iron deck.²

The quarters must be sufficiently heated, amply lighted, and well ventilated. The requirements in this respect coincide very closely to the British regulations.⁴

Washing places.—Whenever the personnel of the engine-room force comprises more than 10 men, independent of officers, a special wash room, provided with a soft-water faucet, must be furnished for their needs. This washing place, which shall be located as far as possible above the load line and in the vicinity of the boilers, must be of sufficient dimensions to admit of the entire force of the watch using it simultaneously.⁵

Similar provisions must be made on board steamships for the needs of the deck crew and the members of the general service whenever the number in either of these classifications exceeds 15 men. Whenever hot-water faucets are provided for the use of all the passengers,⁵ they must likewise be provided in the wash rooms used by the crew.

Once a week 10 liters (2.64 gallons) of soft water must be distributed to each man of the crew for use in washing linen. Each member of the engine-room force is entitled after each change of watch to 10 liters (2.64 gallons) of soft water.⁵

Toilet accommodations.—The decree of September 21, 1908, provides, in article 16, that every vessel shall have at least one water-closet or

one urinal for the crew. If the crew numbers 10 or more but less than 25, there shall be at least one water-closet and one urinal. If the crew numbers from 25 to 40, three water-closets shall be installed; if there are more than 40 persons in the crew, one additional water-closet for each 40 or fraction thereof must be provided.

The toilets must be provided with abundant water for flushing and shall have ventilating facilities. Toilet rooms must be placed in the upper parts of the ship and be constructed and arranged in such a manner as to avoid foul odors.

On ships having metal hulls the floors of the toilet rooms must have a waterproof covering or one that can be cleaned easily. Arrangements must be made so that the toilets can be cleaned by swabbing. The iron partitions of the urinals must not be covered with wood and they must be furnished with rails properly distributed.

JAPAN.

The provisions of the Japanese laws contain but few specific regulations concerning accommodations for the crews of Japanese vessels. It is provided that, according to the vessel's route, the crew's quarters must be fitted up similarly to the passengers' quarters, and if desired they may be placed before the collision bulkhead.¹

Consul General George H. Seidmore, of Yokohama, in a letter to the Department of State dated October 9, 1915, stated that the matter of sleeping accommodations for the crews of Japanese vessels is largely regulated by custom.

11. HOURS OF LABOR.

UNITED STATES.

Watches at sea.—Section 2 of the act of March 4, 1915, provides that the sailors on all merchant vessels of the United States of more than 100 tons gross, excepting those navigating rivers, harbors, bays, or sounds exclusively must, while at sea, be divided into at least two watches and the firemen, oilers, and water tenders into at least three watches, which shall be kept on duty successively for the performance of the ordinary work incident to the sailing and management of the vessel.

Prior to this law there was no statutory requirement as to the hours of service, but it had long been the custom on seagoing vessels to divide the deck crew into two watches and the engine crew into three watches. Moreover, the numerous large freight vessels on the Great Lakes under the control of the Lake Carriers' Association had been operated for several years on the two and three watch system for deck and engine-room crews, respectively. This system was not, however, adopted by the Great Lakes passenger lines operating on short runs like those between Cleveland and Detroit, Cleveland and Buffalo, Buffalo and Detroit, and such a system as is now required by law will, it is claimed, be exceedingly onerous for such lines.

The act of March 4, 1915, also provides in section 2 that seamen shall not be shipped to work alternately in the fireroom and on deck, nor shall those shipped for deck duty be required to work in the

¹ Ship Inspection Regulations, notification No. 83 of Department of Communications (December, 1900),

fireroom, or vice versa. This provision was evidently inserted to meet conditions said to arise on the Great Lakes in the case of large freight ships. When, however, the whole or any part of the crew are needed for the maneuvering of the vessel, the performance of work necessary for the safety of the vessel or her cargo; or the saving of life aboard other vessels in jeopardy, the provisions of this section do not limit either the authority of the master or other officer or the obedience of the seamen. Similarly, when the vessel is in port or at sea these provisions do not limit the master or other officer from requiring the whole or any part of the crew to participate in the performance of fire, lifeboat, and other drills.

In regard to hours of service of officers, section 3 of the act of March 3, 1913, provides that no officer of any vessel may take charge of the deck watch of a vessel upon leaving or immediately after leaving port unless he shall have had at least 6 hours off duty within the 12 hours immediately preceding the time of sailing. It is also provided that no licensed officer on any ocean or coastwise vessel shall be required to do duty more than 12 hours out of the 24 at sea except in case of emergency when life or property is endangered.

Hours of labor in port.—At all times when a vessel of the United States is in a safe harbor a day's work for the seamen consists of nine hours, inclusive of the anchor watch.¹ Licensed officers on any ocean or coastwise vessel are not required to do duty in excess of 9 hours in any 24 while the vessel is in port, including the date of arrival.²

Work on Sundays and holidays.—When a vessel is in a safe harbor no seaman is required to do any unnecessary work on Sundays or the following-named days: New Year's Day, the Fourth of July, Labor Day, Thanksgiving, and Christmas Day, but this provision does not prevent the dispatch of a vessel on regular schedule or when ready to proceed on her voyage.¹

GREAT BRITAIN.

Watches at sea.—There are no definite provisions in the British laws with respect to the division of the deck crew into two watches and the engine-room crew into three watches. The custom is so firmly established, however, that apparently it has not been deemed necessary to incorporate it into legislation.

Hours of labor in port.—No provision is made in the laws of Great Britain with respect to the hours of labor required of the crews of British vessels while in port.

Work on Sundays and holidays.—Up to the present time no legal restrictions have been imposed on British vessels with respect to labor of the crew on Sundays and holidays. This subject was discussed by the House of Lords in November, 1908, but no definite action was taken at that time.

GERMANY.

Watches at sea.—The Seemannsordnung of June 2, 1902, provides for the division of the crews of German vessels into watches. Section 36 stipulates that on vessels at sea operating on voyages of more than

¹ Act of Mar. 4, 1915, sec. 2.

² Act of Mar. 3, 1913, sec. 3.

10 hours' duration, the men in the deck and engine watches going off duty may be used for the ship's service only under pressing circumstances. On steamships each engine-room watch must attend to the required drawing of ashes before going off duty.

On steamships in the trans-Atlantic trade, the engine-room crew must be divided into three watches. Trans-Atlantic trade, as understood in this connection, comprises what is included in the marine accident insurance law (Seeunfallsversicherungsgesetz) under Atlantic and "lange Fahrt" voyages, namely, those in the Atlantic, Indian, and Pacific Oceans and beyond. Otherwise, the circumstances under which a crew shall work in more than two watches shall be fixed by the Federal Council. By a decree¹ of the Federal Council, under date of June 16, 1903, it is provided that "on passenger vessels in the trans-Atlantic trade which carry more than 200 passengers, and have an average speed of more than 12 knots per hour, the working time for the ship's officers on deck shall be divided into three watches, provided that not more than one officer is required for each watch.

Hours of labor in port.—Section 35 of the Seemannsordnung, of June 2, 1902, provides that when the vessel is in port or at anchor the seamen may, only under pressing circumstances (dringenden Fällen), be required to work more than 10 hours per day. In the Tropics the working time shall be limited to 8 hours per day, except in the case of members of the crew engaged exclusively in watch duty or in duties relating to the care and service of persons on board. In computing the working period, watch service is to be included.

The provisions of the above paragraph do not apply to the ship's officers who must, however, be given at least 8 hours' rest in every 24 in port or at anchorage.

Work performed in excess of that stipulated above, when the vessel is in port or at anchor is to be paid for as overtime, except when it is required for the care and service of passengers on board the vessel or for the safety of the vessel in case of impending danger.

Work on Sundays and holidays.—The German law provides that while a vessel is in port or at anchor, work, including watch duty, may be demanded on Sundays and holidays only so far as the same is required unavoidably, is necessary on account of the passengers, or is incapable of postponement. Under this head is included such work as is necessary for the security of the ship, for the working of the engines, the drying of sails, boats' service, and the catering for and attendance of the persons on board. Other work may be done only in the most pressing cases.²

In the German Empire and in the protectorates, the holidays of the port where the ship is lying must be kept as such, but in foreign countries and at sea the holidays observed are those of the home port of the vessel.³

The members of the crew must not, even with their own consent, be employed for loading or discharging cargo on Sundays and holidays while the vessel is within the limits of the Empire either in port or at anchor. This regulation does not apply, however, to the load-

¹ Bekanntmachung von 16 Juni, 1903, betreffend die Dreiteilung des Wachtdienstes auf Kauffahrteischiffen.

ing of steamships which regularly carry the imperial German mail nor to boats used for the loading and unloading of cargo, passengers, baggage, or perishable goods upon or from such vessels, nor to fishing boats employed in fishing on the high seas. Moreover, exceptions to these provisions may be made at any time in cases of necessity by an official to be appointed by the Zentralbehörde of the Federal State.¹

NORWAY.

Watches at sea.—It appears that the hours of duty on board Norwegian ships are fixed by custom rather than by governmental regulations, the law stating that "when the ship is at sea, the hours of duty shall be divided in the customary way during the 24 hours."²

With regard to the number of consecutive hours that a seaman may be required to work, the Norwegian law is explicit:³

The consecutive working hours in port and at sea must under no circumstances exceed 18 hours, unless it be peremptorily necessary.

To the person who has worked 18 hours, or, as an exception more than that, 8 hours rest is due, if the ship is in port, and watch-and-watch if the ship is at sea.

If the total number of working hours, at sea and in port together, during the day of 24 hours in which the ship leaves a port or arrives at one exceeds 14 hours, reckoned from the time on the day of arrival at which the work finishes, extra pay must be given.

In both maximum working periods, 18 and 14 hours, respectively, the watch attendance under way and the meal hours are included.

If any member of the crew keeps night watch between 8 p. m. and 6 a. m., he is entitled to either exemption from work for a corresponding number of hours in the course of the day or to extra pay at 25 öre (6.7 cents) per hour, at the option of the master.⁴

None of the above provisions, however, apply to Norwegian vessels engaged in sealing, fishing, or whaling, or those engaged in dressing and handling fish products.

Hours of labor in port.—The provisions of the Norwegian law with respect to hours of labor on Norwegian vessels while in port correspond very closely to the requirements of the German law. The working hours on board Norwegian vessels while in port as far as regards loading and discharging cargo, must conform to the daily working hours in practice at the port in question, both with reference to length of time and to meal hours.⁴

If these working hours amount to less than 10 hours, the Norwegian law permits other work to be carried on before or after such hours, but not before 6 a. m. or after 6 p. m., unless extra pay is given to the seaman. If, however, the working hours exceed 10 hours a day, or if any of the crew are employed before 6 a. m. or after 6 p. m., they are entitled to extra pay—fractions of an hour to be reckoned proportionately.⁵

When loading or discharging in port in the Tropics during the hot season, the working hours are limited to eight hours per day. If, in such a case, any of the crew are employed at work other than discharging or loading, they are entitled to extra pay as provided in the

¹ Seemannsordnung of June 2, 1902, sec. 37.

² Law concerning the public supervision of the seaworthiness of ships, etc., of June 9, 1903, as amended by the law of Sept. 18, 1909, sec. 86.

³ Ibid., sec. 89.

⁴ Ibid., sec. 91.

⁵ Ibid., sec. 87.

above paragraph, if the working hours exceed eight hours a day by more than one hour.¹

Work on Sundays and holidays.—The provisions of the Norwegian law with respect to hours of labor on board Norwegian vessels on Sundays are as follows:

With the exception of what work is required for the safety and working of the ship, the management of the engines, the necessary drying of sails, the boat service required, and preparation of the food, no work shall be imposed on the crew on such days, unless it is of urgent necessity. This, however, does not include any obligation undertaken to load or unload on Sundays and holidays.²

Under certain circumstances, however,³ the master may require the crew to load or unload on Sundays and holidays by paying an extra allowance.³

FRANCE.

Watches at sea.—The law of April 17, 1907, contains the following general regulations regarding the hours of labor aboard French vessels at sea:

While at sea and in foreign ports the deck and engine departments serve in watches. The deck department serves in at least two watches, and this department must be manned in such a way that each man is required to work not more than 12 hours a day.⁴

The engine department must be divided into three watches on all ships of more than 1,000 gross tons making voyages of 400 miles or more in the over-seas international coasting and national coasting trades. In special cases administrative officers may apply this rule to other trades.⁵

No member of the crew, either of the deck or the engine department, may refuse to work, whatever the hours of labor may be, when commanded to do so. But except in cases of distress or those involving the safety of the ship, of persons on board, or of the cargo, of which the captain is to be the sole judge, every extra hour of work beyond the limits fixed above shall receive extra pay according to the articles of agreement and maritime custom, and the details must be entered in the log by the master thereof.⁶

The general provisions of the law of April 17, 1907, in regard to division of crew into watches at sea have been supplemented by the more detailed regulations of the decree of September 20, 1908, the more important being the following:⁷

On vessels having on board, in addition to the captain, at least two officers, the deck service must be organized in more than two watches for the officers in the following cases:

1. On sailing vessels equipped for voyages in the over-seas trade beyond Cape Horn and the Cape of Good Hope.

2. On steamships: (a) Having a gross tonnage of at least 3,000 tons; (b) making a voyage under ordinary conditions of more than 10 days; (c) when the voyage requires the employment of one of the officers, either at sea or in a port, for more than 12 hours of overtime work in a period of seven consecutive days.

3. On merchant ships of 200 gross tons and upward, other than those specified in section 25 of the law of April 17, 1907 (ships with a gross tonnage of more than 1,000 tons engaged in voyages of at least 400 miles from a French port in the over-seas, international coasting, and national coasting trades), the engine department must be divided into three watches in every case where division into two watches would necessitate more than 10 hours work per day on more than two consecutive days.

On merchant ships of less than 200 but more than 25 gross tons engaged in trades other than the over-seas or the international

¹ Law concerning the public seaworthiness of ships, etc., of June 9, 1903, as amended by the law of Sept. 18, 1909, sec. 88.

² Maritime law of Norway of July 20, 1893, sec. 54.

³ *Ibid.*, sec. 96.

⁴ Law of April 17, 1907, sec. 24.

⁵ *Ibid.*, sec. 25.

⁶ *Ibid.*, sec. 26.

coasting trade, no member of the crew can, except in cases where the safety of the ship, passengers, or cargo is in jeopardy (cases of which the captain is the sole judge), be compelled to perform, without extra compensation, more than 6 days' service each week, or a total of 72 hours if he is a member of the deck crew or more than 54 hours if he is a member of the engine crew and that crew is divided into two watches.¹

The decree of September 20, 1908, makes the following exceptions to the above provisions:

Section 17 provides that neither the provisions of the decree of September 20, 1908, nor those of the act of April 17, 1907, above quoted, are applicable to ships engaged in pilotage, salvage, or similar operations. Towboats also are exempted from those provisions, provided, however, that the hours of labor do not exceed 72 hours for deck service and 54 hours for engine-room service during a period of 6 days in a week.

Section 17 makes a further exception in the case of merchant ships of 200 gross tons and upward which may have in the deck department or engine department only one watch when by reason of short voyages the ship's service during a period of 24 hours can be organized in such a manner as to satisfy the following conditions: (1) That the total working period shall not exceed 12 hours in the case of the deck crew and 9 hours in the case of engine-room crew; (2) that the service shall necessitate not more than 7 hours continuous work in the deck department nor more than 5 hours in the engine department; (3) that the crew shall have uninterrupted rest for a period of at least 6 hours.

Section 25 of the law of April 17, 1907, provides that there shall be in each watch of the engine crew at least one fireman for every three fires. This statutory requirement is supplemented by section 18 of the decree of September 20, 1908, which provides that the statutory requirement is not applicable in cases where a group or battery of boilers has four fires or four doors in one stokehold, and where the total surface area of the grates does not exceed: (1) 7.3 square meters (78.6 square feet) in the case of ordinary boilers with a return flame on natural draft; (2) 7 square meters (75.3 square feet) in the case of tubular boilers with natural draft; (3) 6 square meters (64.6 square feet) in the case of boilers with forced draft; and (4) 3 square meters (32.2 square feet) in the case of boilers with accelerated forced draft. This provision is, moreover, not applicable to vessels equipped with automatic stokers or have methods of firing that reduce the labor.

Hours of labor in port.—If a French ship is in port or in a sheltered roadstead the seaman shall work not more than 10 hours a day, anchor watch included, in the deck department, nor more than 8 hours a day in the engine-room department. The cumulative periods of work while in the roadstead or in port and at sea, including the day of arrival and the day of departure may, however, amount to 12 hours for the deck crew without entitling the seamen to extra pay, provided the days of arrival and departure are not oftener than two a week.²

¹ Decree of Sept. 20, 1908, sec. 14.

² Law of Apr. 17, 1907, sec. 27.

Work on Sundays and holidays.—Sunday must be devoted, so far as possible, to rest. Nevertheless, the captain may choose any one day in seven as a rest day for all or any part of the crew. In ports and sheltered roadsteads of France and the French colonies the crew are not required to work in any manner on one day in seven except on urgent work. At sea, except in cases of distress or where the safety of the ship, those on board, and the crew is involved, of which the captain is to be the judge, the crew shall on one day of the week be exempt from all work except work necessary for the safety and navigation of the ship, the management of machinery, necessary daily duties, and personal services. On such days not more than two hours in the morning shall be required for cleaning ship. Except under special circumstances already indicated, every hour of extra work on the weekly day of rest shall receive extra pay.¹

JAPAN.

Watches at sea.—There are no Japanese laws or regulations upon the subject of hours of labor for the crew while at sea. "Custom" prevails, and in the matter of hours of labor the English system of watches is followed on foreign-going vessels.

The Chief of the Bureau of Mercantile Marine, in conversation with Consul General Seidmore, of Yokohama, remarked that matters concerning the question of hours and wages were left to the individual employers to decide, rather than for the laws of the Empire to prescribe. "Custom," he stated, is so strong that it is impossible for any great injustice to be done to seamen by their employers in this respect.²

Hours of labor in port.—There are no Japanese laws or regulations upon the subject of hours of labor for the crew while in port. As in the case of hours of labor at sea, "custom" prevails.

Work on Sundays and holidays.—There are no Japanese laws or regulations upon the subject of hours of labor for the crew on national holidays or on one day in seven.

12. HOSPITAL ACCOMMODATIONS ON SHIPS.

UNITED STATES.

All merchant vessels of the United States which make voyages, in the ordinary course of their trade, of more than three days' duration between ports and carry more than 12 seamen must have a compartment for hospital purposes. This hospital compartment must be entirely separated from the other spaces, and must have at least one bunk for every 12 seamen in the crew, with the provision, however, that not more than six bunks shall be required in any case. This requirement was made for the first time in the act of March 4, 1915, section 6.

GREAT BRITAIN.

No provision regarding hospital accommodations on merchant ships is made in the laws of Great Britain, but section 26 of the Board of Trade Instructions as to the Survey of Masters and Crew Spaces, issued in 1913, contains the following regulation:

Whenever in any vessel separate and reserved accommodation of a suitable character for sick or disabled seamen is provided, complying as regards floor area, cubic capacity, construction, lighting, ventilation, etc., with these regulations and instructions, it should be certified as "crew's hospital" and be included with the deductions made on account of crew space from the tonnage of the vessel.

GERMANY.

The provisions of the German laws with respect to hospital accommodations for the crew specify that all vessels in the "grosse Fahrt" carrying crews of more than 10 men, and all vessels of more than 3,000 cubic meters (1,060 register tons) gross measurement engaged in the "mittlere Fahrt" must be provided with one quietly situated well-ventilated, and bright hospital room. In the case of crews comprising 30 men, the hospital room must contain at least one berth of the same size, arrangement, and equipment as required for the sleeping quarters of the crew. If the crew consists of more than 30 men, there must be at least two such berths.¹

It is provided, however, that competent local officials may make exemptions or less stringent requirements in the case of ships whose construction was begun prior to October 1, 1905. Ships that are not required to have a ship physician may use the hospital room for other purposes when it is not required for hospital purposes. It must, however, be thoroughly ventilated and cleaned before it is again occupied by a sick person.¹

All merchant ships engaged in the "grosse Fahrt" or "mittlere Fahrt," which carry or may carry more than 50 passengers or more than 100 persons in all during a sea voyage of at least six consecutive days, must provide a physician (one approved in Germany), whose services shall be available without charge to the members of the crew, third-class passengers, and those carried between decks.²

NORWAY.

The Norwegian laws with respect to hospital accommodations for the crew are specific as to the number of bunks required, as is indicated in the following extract from the law:³

In ships carrying a crew of 12 hands or upward, a separate berth for patients shall be provided, with sufficient light and air, containing: Not less than one bunk when the number of the crew is from 12 to 17, not less than two bunks when the number of the crew is from 18 to 30, not less than three bunks when the number of the crew is from 31 to 45, and not less than four bunks when the number of the crew is from 46 or upward.

These provisions do not apply to fishing vessels, nor to other vessels in any service which, under ordinary circumstances, would not keep them at sea for more than three days.

FRANCE.

The French law requires that every ship making voyages of more than 48 hours duration and carrying more than 100 persons on board, including passengers and crew, must have a hospital compartment.

¹ Bekanntmachung betreffend Krankenfürsorge auf Kuffahrtschiffen, vom 3 Juli, 1905 (Reichs-Gesetzblatt p. 568), sec. 12.

² Ibid., sec. 13.

³ Law of Sept. 18, 1909, sec. 45.

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This compartment must be located on the main deck or the upper between-decks, separated as far as possible from the quarters of the crew and passengers and in a section that is suitably lighted and ventilated.

The hospital must be divided into two compartments, one reserved for men and the other for women. A bed must be provided for each 40 persons on board, up to the number of 200 persons, after which a bed must be provided for each 60 persons on board.¹

The total cubic air space occupied by the hospital must represent a minimum of 4 cubic meters (141.2 cubic feet) for each person liable to be quartered there. The height of the ceiling must not be less than 1.83 meters (6 feet.)¹

JAPAN.

The provisions of the Japanese laws specify that on every emigrant vessel a housed-in space must be set apart on the upper passenger deck for use exclusively as a hospital. This space must contain not less than 18 square superficial feet for every 50 passengers and the space must be fitted with bunks, bedding, and other necessities.²

13. DESERTION.

The offense of desertion merits particular attention because it seems to be in this connection that the maritime penal laws of all countries assumed their earliest aspect. One can easily understand that violence, assault, outrages, insubordination, thefts, and frauds constitute misdemeanors and should be met with repressive measures. Desertion, on the other hand, is merely the failure to carry out a civil or commercial engagement. The sailor who deserts refuses his service. Nevertheless, the legislation of all countries for many years deemed it necessary to severely punish the deserting sailor, although at the present time there are marked differences in the usage of various countries.

UNITED STATES.

The laws of the United States provide that whenever any seaman who has been lawfully engaged or any apprentice to the sea service deserts his ship, the offense is punishable by the forfeiture of all or any part of the clothes or effects he leaves on board, and of all or any part of the wages or emoluments which he has then earned.³

GREAT BRITAIN.

The laws of Great Britain stipulate that if any seaman who has been lawfully engaged or any apprentice deserts from his ship, he is liable to forfeit all or any part of the property which he leaves on board and the wages which he has then earned. If the desertion takes place abroad, the seaman is liable to forfeit the wages he may earn in any other ship in which he may be employed until his next return to the United Kingdom, and he is required to refund any excess of wages paid by the master or owner of the ship to any substitute

¹ Decree of Sept. 21, 1908, sec. 29.

² Ship Inspection Regulations, Notification No. 88 of Department of Communications, art. 90.

³ Rev. Stat., 4596, amended by sec. 19 of act of Dec. 21, 1898, and sec. 7 of act of Mar. 4, 1915.

engaged in his place at a higher rate of wages than the rate stipulated to be paid to him. It is also stipulated that if the desertion takes place outside the United Kingdom, he is liable to imprisonment for any period not exceeding 12 weeks, with or without hard labor.¹

In each case of desertion the captain may, with or without the consent of the officers or the local police, bring the seaman back on board. Police officers and constables are obliged to render every assistance to the captain in this connection. If the seaman demands it, he may first be brought before a competent court for a hearing and if it appears to the court that the sailor has been brought back to the ship because of improper or insufficient reasons, the court may inflict on the captain a fine of £20 at the most. The court may always order the seaman who is accused of being a deserter to be brought on board the vessel, except, however, in cases where the seaman has given notice to the captain or the owner 48 hours before the time when he should have been back on the vessel.²

In order to check the fraudulent practice of some men who engaged simply to obtain something under the advance note and without any intention of going to sea the merchant shipping act of 1906 provided:

That in cases where a seaman who has been lawfully engaged and has received under his agreement an advance note, after negotiating his advance note, willfully or through misconduct fails to join his ship or deserts therefrom before the note becomes payable, he shall be liable to a fine not exceeding £5 or at the discretion of the court to imprisonment for not exceeding 21 days.

If it is shown to the satisfaction of the superintendent that a seaman who has been lawfully engaged has willfully or through misconduct failed to join his ship, the superintendent is required to report the matter to the Board of Trade and that board may direct that any of the seaman's certificates of discharge shall be withheld for such period as they may see fit, and while a seaman's certificate of discharge is so withheld, the registrar general of shipping and seamen and any other person having the custody of the necessary documents, may, notwithstanding anything in the merchant-shipping acts, refuse to furnish copies of any of his certificates of discharge or certified extracts of any particulars of service or character.

GERMANY.

The laws of German distinguish three classes of desertion: Desertion before the departure of the vessel, desertion during the voyage, and desertion of a sailor who runs away, having taken his wages with him. In the first case the captain does not have the right to arrest the sailor. This right only applies in the case of a sailor who deserts during the voyage.

The deserter loses his right to salary, unless he returns voluntarily and does not have to be brought back by force. The wages and, if these are not sufficient, the property of the deserter may be confiscated by the owner to reimburse himself for any expense which the desertion may have occasioned him. If the wages are not necessary for this purpose, they are turned over to the Seemanskasse.

Desertion before commencing service is punished only by a fine of 60 marks. Once the sailor has entered on his duties, however, desertion is punished by a maximum fine of 300 marks or by a maximum penalty of imprisonment for three months. It is provided, however, that imprisonment may be imposed not to exceed a year if the deserter has taken his wages with him.¹

NORWAY.

The Norwegian laws stipulate that in cases where a seaman deserts the ship, his outstanding wages and the clothes and effects left by him on board may be forfeited for the benefit of the owners. If he is caught in the act of deserting, or seized after having deserted, the master may have him imprisoned ashore or on board until the departure of the ship. It is also provided that if a seaman absents himself from the ship without permission, his wages for the time he has been absent may be forfeited.²

FRANCE.

Desertion is defined under the French law (1) as the act of voluntarily allowing the vessel to depart on which the deserter is engaged; and (2) absence without leave for more than three days in France or more than two days abroad. A deserting seaman under the French laws loses the right to the wages due him at the time of desertion. If he is married, a third of his wages is returned to his wife, a third to the ship owner, and a third to the "Caisse des invalides de la marine." If he is single, the owner and the "Caisse des invalides" share the salary in equal parts.

If the desertion takes place in France, the penalty is imprisonment for two to six weeks; if abroad, the penalty is from a month to a year. The commissioner of maritime registry or the consul must require the police to make a search for the deserter, who can be punished according to the rules of discipline or can be brought at once before a commercial naval court.

In the case of French vessels in French ports, the commissioner of maritime registry may place maritime police on board day and night in order to prevent desertion. Deserters when arrested are required to pay the cost of the search according to the tariff of the navy.³

The commercial naval court mentioned above is in many respects similar to the British naval court. It consists of five members presided over by the commanding officer of a State ship, a commissioner of the Inscription Maritime, or a consul. The members of the court, beside those mentioned above, may consist of the senior master, officer, or boatswain of merchant vessel present, a shipowner or person who has owned a ship, the captain of a port or his substitute, a retired or active ocean-going shipmaster or a French merchant, according to the place, at home, in the colonies, or abroad where the naval court is constituted.³

¹ Seemannsordnung of June 2, 1902, arts. 93-96.

² Maritime law of Norway, July 20, 1893, secs. 106-107.

³ Return to an order of the House of Lords showing legal obligations of owners of merchant vessels in various countries; Board of Trade, Mar., 1914, p. 47.

JAPAN.

The Japanese mariners' law gives the master full power to compel a seaman to return after he has left a vessel without obtaining permission, and if necessary the master may request the assistance of a Japanese naval vessel, the local officials, or the maritime authorities. If a seaman is absent from his vessel for 24 hours or more without the permission of his master he is liable to a fine of from 2 to 20 yen (\$0.996 to \$9.96), and if he deserts he is liable to imprisonment for a period of 11 days to 6 months.¹

¹ The Mariners' Law of 1899, arts. 54 and 64.

Chapter III.—ADMINISTRATION OF NAVIGATION LAWS.

UNITED STATES.

The administration of the navigation laws of the United States is centered largely in two bureaus of the Department of Commerce, namely, the Bureau of Navigation and the Steamboat-Inspection Service.

The Bureau of Navigation was created by act of Congress approved July 5, 1884, and was made a part of the Treasury Department, while the Steamboat-Inspection Service was created by the act of February 28, 1871, and attached to the Treasury Department.

Upon the formation of the Department of Commerce and Labor under the act of February 14, 1903, the two bureaus or services were transferred to that department. When the Department of Commerce and Labor was divided under the act of March 4, 1911, both bureaus were assigned to the Department of Commerce.

The functions now exercised by the Bureau of Navigation were formerly intrusted to the Register of the Treasury. The duties performed by the latter office, when it was superseded by the Bureau of Navigation, are indicated in the following extract from a circular on the organization of the Bureau of Navigation, issued July 18, 1884, by Charles J. Folger, Secretary of the Treasury:

The duties relating to navigation hitherto assigned to the Register of the Treasury having been devolved upon him, he will sign, as Commissioner of Navigation, the certificates of registry of vessels as authorized and required by section 4158 of the Revised Statutes, and he will cause to be transmitted the requisite supply of forms of such instruments to collectors of customs; but he will treat as valid and still in force all such outstanding instruments as bear the signature of the Register of the Treasury, and will allow the issues of such instruments with the Register's signature till new ones with his own official signature can be supplied to collectors.

The Commissioner of Navigation shall supervise the action of shipping commissioners as devolved upon the Secretary of the Treasury by the tenth section of the shipping act approved June 26, 1884, and, with the approval of the Secretary of the Treasury, shall regulate the mode of conducting business in their offices, and perform such other duties pertaining to the care of seamen as would devolve upon the Secretary of the Treasury by virtue of the provisions of the said act or Title LIII of the Revised Statutes.

He will also give instructions to the collectors of customs in regard to the documenting of vessels and their clearance, entry, and movements, and the collection of tonnage duties therefrom as far as they may be required by the provisions of said shipping act and Titles XXXIV and XLVIII of the Revised Statutes.

He shall issue also to collectors of customs such instructions in regard to the entry of vessels into ports subject to quarantine as may be required by the public health and permitted by Title LVIII of the Revised Statutes.

The functions of the Bureau of Navigation have been added to from time to time by acts of Congress and are performed by the Commissioner of Navigation under the general direction of the Secretary of Commerce.

The powers and duties of the Commissioner of Navigation include the following:

1. The general superintendence of the merchant marine and merchant seamen of the United States, so far as vessels and seamen are not, under existing laws, subject to any other officer of the Government.¹

2. The decision of all questions relating to the issue of registers, enrollments, and licenses of vessels, and to the filing and preserving of these documents.¹

3. Supervision of the laws relating to the admeasurement of vessels, the assigning of signal letters, official numbers, and all questions of interpretation growing out of the execution of the laws on these subjects.⁴

4. Questions of interpretation relating to the collection of tonnage tax.²

5. Preparation annually of list of vessels of the United States merchant marine with details as to official number, signal letters, names, rig, tonnage, home port, etc.³

6. The preparation of annual reports to the Secretary of Commerce regarding increase of vessels. In this connection he is required to report annually "such particulars as may, in his judgment, admit of improvement or may require amendment" in the navigation laws of the United States."⁴

7. Power to change names of vessels of the United States under such restrictions as are or may be prescribed by act of Congress.⁵

At the head of the Steamboat-Inspection Service is a Supervising Inspector General, who is appointed by the President. In addition, there are 10 supervising inspectors to each of whom is assigned general supervision of the work of inspection in a particular district.

The law requires that the Supervising Inspector General "shall be selected with reference to his fitness and ability to systematize and carry into effect all the provisions of law relating to the Steamboat-Inspection Service."⁶ The supervising inspectors who, like the Inspector General, are appointed by the President, must be selected for their "knowledge, skill, and practical experience in the uses of steam for navigation, and each of them shall be competent to judge of the characters and qualities of steam vessels, and of all parts of the machinery employed in steaming."⁷

The supervising inspectors and the Supervising Inspector General are required to meet as a board at least once in each year at Washington. The board assigns to each supervising inspector the limits of territory within which he shall perform his duties. The board is required also to establish all regulations necessary to carry out in the most effective manner the various provisions of law relating to the inspection of vessels.

An important proviso, limiting the regulatory power of the board as a whole, was made by the act of February 8, 1907, which contains the following provision:

That the Secretary of Commerce may at any time call in session, after reasonable public notice, a meeting of an executive committee, to be composed of the Super-

¹ Sec. 2 of act of July 5, 1884, as amended by secs. 4 and 10 of the act of Feb. 14, 1903.

² Sec. 3 of the act of July 5, 1884.

³ Sec. 4 of the act of July 5, 1884.

⁴ Sec. 4 of act of July 5, 1884, as amended by secs. 4 and 10 of act of Feb. 14, 1903.

vising Inspector General and any two supervising inspectors, which committee, with the approval of the said Secretary, shall have power to alter, amend, add to, or repeal any of the rules and regulations made, with the approval of the Secretary of Commerce, by the board of supervising inspectors.

The Supervising Inspector General superintends the administration of the steamboat-inspection laws, presides at the meetings of the board of supervising inspectors, receives all reports of inspectors, receives and examines all accounts of inspectors, and makes full reports at stated periods to the Secretary of Commerce.¹

The principal administrative function performed by the supervising inspectors is the supervision of the work of the several boards of local inspectors within their respective districts. The law requires each supervising inspector to see that the local inspectors in his district "execute their duties faithfully, promptly, and, as far as possible, uniformly in all places, and shall, as far as practicable, harmonize differences of opinion existing in different local boards."² This requirement of the Revised Statutes, together with the requirement that the supervising inspectors shall meet as a board at least once each year, has for its purpose the securing of uniformity in the application of the laws and regulations of the Steamboat-Inspection Service.

In each of the 10 districts under the immediate supervision of supervising inspectors are a number of local inspectors, who are known as inspectors of hulls and inspectors of boilers. These inspectors are required to have technical knowledge qualifying them for their respective duties. The inspectors of hulls must have a "practical knowledge of shipbuilding and navigation and the uses of steam in navigation," and be able to make a "reliable estimate of the strength, seaworthiness, and other qualities of the hulls of vessels and their equipment deemed essential to safety of life in their navigation."

Inspectors of boilers are required to have such "knowledge and experience of the duties of an engineer employed in navigating vessels by steam, and also of the construction and use of boilers and machinery and appurtenances therewith connected, as to be able to form a reliable opinion of the strength, form, workmanship, and suitability of boilers and machinery to be employed, without hazard to life from imperfections in the material, workmanship, or arrangement of any part of such apparatus for steaming."³

The law provides that the inspector of hulls and the inspector of boilers in any local district shall, upon designation of the Secretary of Commerce, constitute a board of local inspectors.

The general character of the work performed by the Steamboat-Inspection Service has been described in detail in the section on laws relating to the inspection of vessels. (See pp. 54-56.)

A number of functions relating to shipping are performed by shipping commissioners, who apparently are not under the supervision or control of the Commissioner of Navigation, but are directly responsible to the Secretary of Commerce, by whom they are appointed. The law provides that a shipping commissioner shall be appointed "for each port of entry, which is also a port of ocean navi-

gation, and which in his [Secretary of Commerce] judgment may require the same."¹ In ports in which there is no shipping commissioner "the whole or any part of the business of a shipping commissioner shall be conducted by the collector or deputy collector of customs of such port."²

The duties of shipping commissioners are defined in section 4508 of the Revised Statutes as follows:

First. To afford facilities for engaging seamen by keeping a register of their names and characters.

Second. To superintend their engagement and discharge in manner prescribed by law.

Third. To provide means for securing the presence on board at the proper times of men who are so engaged.

Fourth. To facilitate the making of apprenticeships to the sea service.

Fifth. To perform such other duties relating to merchant seamen or merchant ships as are now or may hereafter be required by law.

GREAT BRITAIN.

The administration and enforcement of the navigation laws of Great Britain is vested almost exclusively in the marine department of the Board of Trade. This department is one of a number of departments composing the Board of Trade, the others being as follows: Finance department, harbor department, railway department, commercial department, department for the settlement of industrial disputes, patent office, bankruptcy department, labor exchange and unemployment insurance department, and companies department.

The Board of Trade is one of the principal administrative divisions of the British Government and is under the control of a president, who is generally a member of the cabinet. Its staff consists also of a parliamentary secretary, a permanent secretary, a second permanent secretary, two professional members, a solicitor, and assistant secretaries or other officials in charge of the several departments or divisions.

The marine department is under the control of the assistant secretary and administers all affairs relating to the following subjects:³ Naval courts, boiler explosions, crew spaces, discipline, relief of distressed seamen (rules and principles), examination of masters, mates, and engineers, international code of signals, international questions concerning shipping, life-saving apparatus, ships' lights, lime and lemon juice and antiscorbutics, load line, medical scale for merchant ships, mercantile marine offices and local marine boards, inquiries into misconduct, naval reserve, survey of passenger ships, rewards for saving life, measurement of tonnage, training ships, unseaworthy ships, inquiries into wrecks and casualties, wreck register, liability of shipowners, and registration of ships.

In addition there are three special divisions of the marine department which perform special functions and appear to be separately administered.⁴ These are the general register and record office of

¹ Rev. Stat., sec. 4501, as amended by sec. 27 of the act of June 26, 1884; by secs. 4 and 10 of the act of Feb. 14, 1903; and by the act of Mar. 4, 1911.

² Rev. Stat., sec. 4503.

shipping and seamen, the consultative department, and the office for survey and admeasurement of steamships, examination of engineers, and superintendence of emigration.

The general register and record office of shipping and seamen is in charge of the registrar general of shipping and seamen and an assistant and administers affairs relating to the following subjects:¹ Central register of ships belonging to the United Kingdom and colonies; mercantile navy list; international code of signals book; British code list; sea apprentices' indentures; central indexed register of seamen; custody and record of ships' agreements; official log books, etc.; central register of sea fishing boats; registration of births, deaths, and marriages at sea; continuous certificates of discharge; issue and record of certificates of masters, mates, engineers, skippers, second hands, and cooks; royal naval reserve; and general register and index of force.

The principal officials of the consultative establishment are the following:¹ Engineer surveyor in chief and inspector of chain cables and anchor testing, principal shipwright surveyor, principal surveyor for tonnage, and principal examiner of masters and mates.

The functions of the office for survey and admeasurement of steamships, examination of engineers, and superintendence of emigration are clearly indicated in the designation of the office. The principal officials in this division, as listed in the Shipping World Year Book for 1915 are the following: Principal officer for London district, chief examiner of engineers, and chief inspector of ships' provisions.²

A number of the functions of the finance and harbor departments of the Board of Trade relate directly to shipping. For example, among the subjects assigned to the finance department are the following:² Accounts of lighthouse boards; accounts of consuls and colonial shipping masters, including accounts of reliefs of distressed seamen; accounts of superintendents and receivers of wreck; claims on owners of vessels; merchant seamen's fund (pensioners); seamen's money orders; Greenwich Hospital fund; seamen's savings banks; seamen's temporary deposit bank (Liverpool); and wages and effects of deceased seamen.²

Among the functions performed by the harbor department are the following that relate to shipping: Harbors, lighthouses and fixed fog signals, loans to harbor authorities, local charges on shipping, pilotage, protection of navigable channels, etc., provisional orders, piers and harbors, and tidal waters, wreck, and salvage.²

In regard to the other administrative agencies controlling shipping, Kirkaldy, in his recent work on British Shipping: Its History, Organization, and Importance (pp. 263-264), makes the following statement:

In addition to the statute law relating to merchant shipping which is enforced by the marine department of the Board of Trade and its officers, there is a large body of statutory rules and regulations, orders in council, and departmental orders made under the merchant shipping acts for the regulation and control of merchant shipping. These regulations are supplemented by instructions issued by the marine department for the guidance of its officers in carrying out their duties under the merchant shipping acts and other acts.

Finally, although the Trinity House, which dates back to the reign of King John, and had many privileges conferred upon it by Henry VIII, still has charge of the

lighting and buoying of the coast and channels of England and Wales, it has been controlled financially by the Board of Trade since 1853. From the year 1854 the Trinity House, under the merchant shipping acts of that year and subsequently, has been responsible for removing wrecks which may be dangerous to navigation, and is charged with the appointment and licensing of pilots at several ports. Thus the connection of the Board of Trade with shipping is very complete, and its control and responsibility have increased considerably, more especially of recent years.

GERMANY.

At the head of the administration of maritime affairs in Germany are the marine committee of the Federal Council, the Imperial Chancellor, and the Imperial Ministry of the Interior.

In a number of matters the several States of the Empire have exclusive jurisdiction. This is especially true of shipping on the inland rivers and canals (*Binnenschiffahrt*). But in the more important affairs relating to ocean shipping the Central or Imperial Government is supreme.

The authority of the Imperial Government in maritime affairs is based upon the following provisions of the constitution of the Empire:

Article 4, clauses 7 and 9, provide that among the matters under the supervision and control of the Empire shall be "The organization of a general system for the protection of German trade in foreign countries; of German navigation, and of the German flag on the high seas; likewise, the organization of a general consular representation to be maintained by the Empire,"¹ and "Rafting and navigation upon those waterways which are common to several States, and the condition of such waters; also the river and other water dues."²

Article 54 of the constitution provides as follows:

The merchant vessels of all States of the Union shall form the commercial marine of the Empire.

The Empire shall determine the process for ascertaining the tonnage of seagoing vessels, shall regulate the issuing of tonnage certificates and of ship certificates in general, and shall fix the conditions on which a permit for commanding a seagoing vessel shall be issued.

The merchant vessels of all the States of the Union shall be admitted on equal footing to the harbors, and to all natural and artificial watercourses of the several States of the Union, and all shall be entitled to similar treatment. The duties which shall be collected in the harbors of seagoing vessels, or levied upon their freights as fees, for the use of marine institutions, shall not exceed the amount required for the ordinary construction and maintenance of these institutions.³

On all natural watercourses duties may only be levied for the use of special establishments, which serve for facilitating commercial intercourse. These duties, as well as the duties for navigating such artificial channels as are property of the State, shall not exceed the amount required for the ordinary construction and maintenance of the institutions and establishments. These rules apply to rafting, so far as it is carried on along navigable watercourses.

The levying of other or higher duties upon foreign vessels or their freights than those which are paid by the vessels of the Federal States, or their freights, does not belong to the various States, but to the Empire.

Under the general supervision of the committee on maritime affairs of the Federal Council, the Imperial Chancellor, and of the Imperial Ministry of the Interior, there is a large number of administrative agencies with well-defined spheres of activity, which are, for the most part, under the immediate direction of the Ministry of the Interior. An exhaustive list of the agencies is given in the "Hand-

„*Handbuch für die Deutsche Handelsmarine*“ for 1914 and is briefly summarized as follows:

A. TECHNICAL COMMISSION FOR OCEAN SHIPPING.

This board has its headquarters in Berlin and consists of a chairman and 10 other members, in addition to a representative of the Imperial Marine Office and an adviser (Beirat). The Director of the Imperial Department of the Interior acts as chairman of the commission, while a Regierungsrat of the Department of the Interior acts as adviser.

B. IMPERIAL IMMIGRATION COMMISSIONERS.

There are two commissioners, one having jurisdiction in the Unter-Wesergebiet and the other in the Unter-Elbegebiet and the Unter-Odergebiet.

C. IMPERIAL EXAMINATION INSPECTORS.

1. Two inspectors of examinations for masters and mates; one for Prussia and another for Mecklenburg-Schwerin, Oldenburg, Lubeck, Bremen, and Hamburg.

2. One inspector of examinations for chief engineer (Schiffsingenieur) and engineers on ocean vessels.

D. COMMISSIONS FOR THE EXAMINATION OF MASTERS, MATES, SCHIFFSINGENIEUR, AND ENGINEERS OF OCEAN VESSELS.

1. Commissions for the examinations of mates and masters of vessels „auf grosser Fahrt“; 3 for Prussia, 1 for Mecklenburg-Schwerin, and 1 each in Oldenburg, Lubeck, Bremen, and Hamburg.

2. Commissions for the examinations of masters of vessels „auf kleiner Fahrt“; 14 in Prussia, 2 in Mecklenburg-Schwerin, and 1 each in Oldenburg, Lubeck, Bremen, and Hamburg.

3. Commissions for the examination of masters of vessels „auf Küstenfahrt“; 22 in Prussia, 2 in Mecklenburg-Schwerin, and 1 each in Oldenburg, Lubeck, Bremen, and Hamburg.

4. Commissions for the examination of engineers on ocean vessels. There are 10 such commissions.

5. Commissions for the preliminary and final examination of Schiffsingenieur.

These „examination commissions“ consist of only one person, who is, in most instances, the head of a navigation school.

E. COMMISSIONS FOR EYESIGHT AND COLOR-VISION EXAMINATION OF SEAMEN.

1. *First examination.*—Twenty-two such „commissions“ in Prussia, 3 in Mecklenburg-Schwerin, 2 in Oldenburg, 1 in Lubeck, 2 in Bremen, and 1 in Hamburg. These commissions also consist of only one person, who, as a rule, is an instructor in a navigation school. In addition, there are a number of physicians representing the See-Berufsgenossenschaft who also are empowered to make the first examination.

2. *Second and later examinations.*—Fourteen such commissions in Prussia, 1 each in Mecklenburg-Schwerin, Oldenburg, Lubeck, Bremen, and Hamburg. In Bremen, Hamburg, and Stettin officials of the See-Berufsgenossenschaft are also empowered to make these

F. OFFICIALS FOR EXECUTING CERTIFICATES OF COMPETENCY FOR MASTERS, PILOTS, SCHIFFSINGENIEURS, AND ENGINEERS OF OCEAN-GOING VESSELS.

There are 6 such officials in Prussia, 3 in Mecklenburg-Schwerin, 1 each in Oldenburg, Lubeck, Bremen, and Hamburg. In Prussia the officials designated for this purpose are the Regierungspräsident of the district; in Bremen, a committee on shipping affairs of the Senate of Bremen; in Hamburg, the deputation for commerce, shipping, and industry.

G. SEE-BERUFGENOSSENSCHAFT.

This commission has its headquarters at Hamburg and is under the general supervision of the Imperial Insurance Office. It is divided into six sections, which have jurisdiction in certain definite territory.

The See-Berufsgenossenschaft is primarily a cooperative accident insurance organization of shipowners which is required under the general insurance laws of Germany. Its benefits extend to two principal classes, namely, (1) persons employed on German vessels as officers, members of the crew, engineers, stewards, or in any other occupation connected with the manning of vessels; (2) persons employed about floating docks or in any other similar work, pilots, life-rescue men, and those employed in the patrolling of waterways.

The See-Berufsgenossenschaft was organized in conformity with the provisions of the imperial insurance laws, which were accepted by the accident insurance association on November 17, 1887. Supplements were made in 1895 and 1900 and the whole code revised in 1901. The revision of 1901 was required on account of the issuance of the new marine accident insurance law of 1900 and remained in force from January 1, 1902, until January 1, 1913, when the imperial insurance ordinance made necessary another revision of the statute.

At the head of the administration of this organization is a board of directors with a chairman selected from its own members.

To facilitate the work of administration the See-Berufsgenossenschaft is divided into six sections with headquarters in the following cities: Section I, Papenburg; Section II, Bremen; Section III, Hamburg; Section IV, Kiel; Section V, Stettin; Section VI, Danzig.

Each section has its board of directors. The board is composed of four members in Section I, five members in Sections II, III, and IV, and three members in sections V and VI. The boards of directors in the several sections are composed of prominent representatives of the German merchant marine.

The enforcement of the rules and regulations of the See-Berufsgenossenschaft is entrusted to special representatives, called Vertrauensmännern, who are selected from among shipowners, captains, teachers in the navigation schools, and other persons intimately connected with shipping. From the decisions of the representatives of the See-Berufsgenossenschaft an appeal to the higher tribunal is permitted in cases of loss.

Germany has no bureau or department which corresponds to the marine department of the Board of Trade in England, and, according to one German authority,¹ the suggestion of the institution of

¹ Grotewold: Die Deutsche Schifffahrt in Wirtschaft und Recht (1914), pp. 164-165.

such an organization has always met with strong opposition in shipping circles. Most of the accident-prevention rules entrusted in England to the Board of Trade have in Germany been delegated to the See-Berufsgenossenschaft. It is stated that this power was given to the See-Berufsgenossenschaft despite the fact that it has very limited authority to enforce compliance with the regulations it issues. That it has accomplished its purpose is a striking tribute to the spirit of cooperation and conciliation among German ship-owners.¹

In preparing technical regulations relating to the construction of ships and their equipment the See-Berufsgenossenschaft has worked in conjunction with the Germanic Lloyd classification society. Regulations concerning the operation of ships are prepared by the See-Berufsgenossenschaft alone.

II. SEAMEN'S OFFICES AND THE LOCAL OFFICIALS IN CHARGE OF SAME.

In Prussia there are 82 seamen's offices, which are, in nearly half the cases, designated as shipping boards (Musterungsbehörde). These boards are under the immediate charge either of the mayor, harbor master, or other Government official in the town, and under the general supervision of the Regierungspräsident of the district in which the seamen's office is located. There are 2 such seamen's offices in Mecklenburg-Schwerin, 5 in Oldenburg, 1 in Lubeck (the office of the police serves, also, as seamen's office in Lubeck), 3 in Bremen, 2 in Hamburg, and 13 in the various colonies and protectorates of the German Empire.

I. OFFICIALS FOR THE MEASUREMENT OF MERCHANT SHIPS.

1. *Imperial Measurement Board*.—This board has its headquarters in Berlin and consists of a director and three other members.

2. *Local ship measurement officials*.—There are 7 local measurement offices in Prussia (1 in each principal custom office), 2 in Hamburg, and 1 each in Mecklenburg-Schwerin, Lubeck, Oldenburg, Bremen, and Tsingtau. The officials designated to execute and issue certificates of measurement are the Imperial Measurement Board at Berlin for Prussia, Lubeck, and the protectorates, and local authorities in the other States.

K. SHIP REGISTRY OFFICIALS.

In Prussia there are 19 offices for the registry of ships in as many different cities. In each case the registry office is the local court (Amtsgericht). In Mecklenburg-Schwerin there are 3 such offices, 1 being the local court while the other 2 are special registry offices. In Oldenburg there are 4 such offices, the local court in each case. In Lubeck and Bremen there is 1 such office which is also that of the local court. In Hamburg there is 1 registry official, and in each of several protectorates there is 1 office, that of the district court.

L. GERMAN SEEWALTE AT HAMBURG.

This council was created by the law of January 9, 1875, and is under the jurisdiction of the Imperial Department of the Marine. Section 1 of this law states that the purpose of the council is to supply

for the safety and facilitation of shipping, information concerning the natural conditions of the ocean so far as this is of value for shipping and concerning navigation conditions on the German coast. The law provides that this council shall have its headquarters in Hamburg and shall be under the jurisdiction of the Imperial Admiralty. The law provides also that along the coast there shall be erected local stations for communication of weather signals and warnings to shipping. There are considerable numbers of officials in this service, including agents, observers, signalers, etc.

M. COAST DISTRICT OFFICES.

There are five such offices all of which are under the jurisdiction of the Imperial Department of the Marine.

N. OFFICES FOR THE INVESTIGATION OF ACCIDENTS AT SEA.

1. Imperial Marine Office.
2. Marine offices, 12 in number.

O. STRANDBEHÖRDEN.

The administration of matters relating to shipwrecks and kindred disasters is entrusted to Strandamter under the provisions of the Strandungsordnung of May 17, 1874.

This service is divided into districts in each of which there is a life saving office. The organization of these offices, the limits of their districts, the appointment of the officials in charge, and the regulations which must be followed are left to the local governments, but general supervision over the administration of these affairs is vested in the Imperial Government. The principal duty of these offices is the rescue of persons and craft in peril at sea.

NORWAY.

The administration of the navigation laws of Norway is largely centered in the Foreign Office. The law of June 9, 1903, concerning the public supervision of the seaworthiness of ships, provides that "the general supervision of ships, and of everything essential to their seaworthiness, shall be under the charge of such ministry of the Government as may be determined by the King," and that a special department, to be known as the Mercantile Marine Department, should be established in the designated ministry for the purpose of transacting all matters connected with the supervision of ships.¹

It was further provided that there should be a director at the head of this department who should be a person "especially conversant with nautical and shipping affairs."

By royal ordinance of July 8, 1903, the Mercantile Marine Department was assigned to the Ministry for Foreign Affairs, Commerce, Navigation, and Industry.

This branch of the maritime administration of Norway corresponds closely to the Steamboat-Inspection Service in the United States and

¹ Law of June 9, 1903, concerning the public supervision of the seaworthiness of ships, art. 3.

exercises its powers of supervision with the aid of (1) ship inspectors, (2) port inspectors, (3) technical surveyors, (4) persons nominated for the occasion, and (5) consuls.¹

The ship inspectors are charged particularly with the investigation of shipping casualties. They must be at least 30 years of age and must have served a sufficient length of time as officers in the merchant marine to have acquired experience and practical skill in nautical and shipping affairs.²

Surveyors must be at least 25 years of age and thoroughly conversant with shipbuilding or engine building, since their duties are of a highly technical character.³

An interesting feature of the law is contained in section 9, which provides that "the King may, with the sanction of the Storting, determine that, in carrying out the supervision, the office concerned may employ the surveying institution, 'Det norske Veritas,' to such extent, for such period and on such conditions as may be determined by special agreement between the office and the institution."⁴

Another interesting provision is the one which permits the employment, on particular occasions, of one or more persons to assist the supervising authorities in matters requiring special knowledge or those which the authorities themselves have no means of attending to.⁵

Other administrative officers are collectors of customs, who register ships and issue certificates of nationality,⁶ and enrollment authorities before whom the crews of vessels must be mustered and discharged. These enrolling officers are appointed by the war office and are under the general direction of registrars general.

FRANCE.⁷

The administration of laws and regulations relating to the merchant marine of France is distributed among several ministries but is, to a considerable degree, concentrated in the Ministry of Marine.

Among the various divisions and bureaus in the Ministry of the Marine, many of which relate to the French Navy, is the Merchant Marine Division ("Direction de la Marine Marchande").

This division has jurisdiction over all matters relating to navigation, whether for commercial or pleasure purposes, to fisheries, pilotage, wrecks, maritime commerce courts, international maritime law, the maritime domain, mutual societies of seamen, etc.

At the head of this division is the Director of the Merchant Marine, who has one assistant and supervises the work of the following bureaus: Bureau of Commercial Navigation, Bureau of Fisheries and the Maritime Domain, and the Bureau of Marine Assistance and Mutual Help and of Bounties and Promotion of the Merchant Marine.

The Bureau of Commercial Navigation is under the control of a chief and an assistant chief and has under its charge the following subjects:

¹ Law of June 9, 1903, concerning the public supervision of the seaworthiness of ships, art. 4.

² Ibid., art. 5.

³ Ibid., art. 6.

⁴ Ibid., art. 9.

⁵ Law of May 4, 1901, concerning the registration of ships, arts. 3, 4, and 5.

1. Fixing of the boundaries of the various maritime districts.
2. Supervision of the syndics of seamen and the maritime guards.
3. Preparation of rules and regulations governing: (a) Captains and harbor pilots; (b) conditions under which a captain's commission may be obtained in the merchant marine; (c) physicians and medicine chests to be taken on board merchant vessels.
4. Preparation of rules and regulations concerning pilotage.
5. Policing of commercial navigation, pilotage, pleasure navigation, and regattas.
6. Investigations relating to wrecks, collisions, and accidents to commercial vessels.
7. Maritime commercial courts.
8. Supervision of sentences, amnesty, pardon and commutation of penalties, conditional discharge, the withdrawal or suspension of commemorative decorations or medals.
9. Hiring of seamen and the repatriation of shipwrecked aliens.
10. Control of legal acts performed on board commercial ships.
11. Investigations and reports on disappearances, and judicial declarations of death.
12. Investigation on behalf of the families of embarked persons.
13. Registration of ships.
14. Carrying of flags.
15. Navigation of neutrals.
16. International maritime law.

The Bureau of Fisheries and the Maritime Domain is under the control of an assistant chief and administers all affairs relating to the following subjects:

1. Policing of fisheries along the coasts, ponds, rivers, and canals where the water is salty, of permanent and temporary fisheries, of oyster beds, mussel beds, and shellfish beds.
2. Registers relating to these establishments.
3. Measures relating to the conservation and restocking of fisheries.
4. Experiments concerning the maritime cultivation of oysters and fish.
5. Supervision of fishing along the seacoast and in the estuaries of rivers.
6. Supervision of the maritime fish wardens, expert fishermen, and the sworn guards.
7. The jurisdictions of expert fishermen in the fifth maritime district.
8. Construction, repair, and equipment of police boats for the fishing trades.
9. Fixing of the limits of the maritime inscription (registry of seamen) and of the points where the saltiness of water ceases in the streams, rivers, and canals.
10. Delimitation of the coast and of the alluvium and diluvium (increase or loss of land by the action of water).
11. Structures of any kind upon the maritime domain.
12. Fisheries and maritime domain of Algeria.
13. International fisheries of the British Channel and the North Sea, the high-sea fisheries of Newfoundland and Iceland.

The Bureau of Marine Assistance and Mutual Help and of Bounties and Promotion of the Merchant Marine is under the control of one chief and one assistant chief of bureau, and administers all affairs relating to the following subjects:

1. Allowance of subsidies to life-saving societies and of rewards for rescue work at sea.
2. Allowance of subsidies to schools of ship's apprentices, and subventions to seamen's societies for mutual assistance.
3. Allowance of indemnities for loss of fishing materials suffered by seamen under exceptional conditions.
4. Questions relating to the application and interpretation of the law of April 21, 1898, creating a mutual fund for the protection of French seamen against the risks and accidents of their calling.
5. Statistics of accidents to seamen.
6. Promotion of coastal fishing.
7. Investigation, in conjunction with the Ministry of Commerce, of questions relating to the granting of bounties to high-sea fishing and to builders of commercial vessels.
8. Communications with the Superior Council of the Merchant Marine.
9. The entry, study, and centralization of matters submitted to the various commissions of that council.

The Director of the Merchant Marine submits to the chief of the general staff for examination—before presenting them to the Minister for his signature—all matters concerning the preparation for a naval war, particularly those relating to the registry of seamen, to officers and crews of merchant vessels, to safety of navigation, and to the saving of shipwrecked persons.

The registry of seamen and everything pertaining thereto and the supervision and protection of the registered seamen are likewise under the jurisdiction of the Ministry of Marine, and it is before the commissioners of marine that the seamen's contracts of hiring are made and their wages paid.

Certain matters more or less connected with maritime affairs are under the control of other Ministers. For example, the Ministry of Public Works is in charge of all questions relating to the execution of work connected with the construction, maintenance, and improvement of harbors, while the Ministry of Commerce is charged with the preparation of plans relating to such work and to the establishment of local tolls (tonnage dues). Among other functions assigned to the Ministry of Commerce is the settlement of bounties. The various commissions charged with inquiries or studies relating to the merchant marine are also under this ministry, which is charged also with the duty of submitting drafts of laws relating to the merchant marine.

The administration of customs, which is under the Ministry of Finance, is charged with the collection of all dues imposed upon shipping, whether levied for the benefit of the State, cities, or chambers of commerce. Consequently, the Minister of Finance countersigns a majority of the laws and decrees relating to the merchant marine.

The work of the Government and of the various private interests connected with the merchant marine of France is coordinated by an extraparlimentary organization known as the Superior Council of the Merchant Marine (*Conseil Supérieur de la Marine Marchande*). This council was created by decree of the Minister of Commerce on June 5, 1914, and superseded the Superior Council of Marine Navigation, created by decree of December 8, 1907 and the Superior Council of Sea Fisheries, created by the decree of December 19, 1907, as well as the extraparlimentary commission on the merchant marine created by decree of November 5, 1903.

The decree of June 5, 1914, provides that the council shall be presided over by the Under Secretary for the Merchant Marine or by one of the vice presidents, and that its membership shall consist of 8 Senators, 18 Deputies, 3 members of the *Conseil d'Etat*, and 60 other persons nominated in the decree for a period of four years, in addition to a number of ex officio members. It is provided that the lay members shall be selected from representatives of the following shipping interests:

1. Shipping corporations engaged in the general and fishing trades.
2. Naval construction and ship classification societies.
3. Associations of shipping agents, ship brokers, and marine insurance agents.
4. Officers of the merchant marine (deck, engine room, and general service).
5. Crews of the merchant marine (deck, engine room, and general service).
6. Associations of pilots and life-saving societies.
7. Associations for pleasure navigation.
8. Doctors and hygienic experts.

Article 2 of the decree of June 5, 1914, names the following ex-officio members of the council who shall serve without any limit as to period of service.

1. Chief or assistant chief of the cabinet of the Ministry of Marine.
2. Chief of the cabinet of the Under Secretary for the Merchant Marine.
3. Division chiefs under the Under Secretary for the Merchant Marine.
4. General administrator or inspector general of the maritime inspection service.
5. Controller general of the merchant marine.
6. Surgeon general or president of the superior council of marine health.
7. Examiner or inspector general of the corps of professors of hydrography.
8. Inspector general of sea fisheries.
9. Officer of the marine designated by the chief of the general staff of the marine among the officers under his supervision, preferably among those stationed in Newfoundland and Iceland.
10. Director of administrative and technical affairs in the Ministry of Foreign Affairs.
11. Director general of customs in the Ministry of Finance.
12. Director of routes and navigation in the Ministry of Public Works.
13. The director of commercial and industrial affairs in the Ministry of Commerce, and in that of Industry, Posts, and Telegraph.
14. Director for postal exploitation in the Ministry of Commerce.
15. A representative of the Ministry of the Colonies.

The several members may be represented by proxy when not able to be present in person.

The decree provides that the Superior Council of the Merchant Marine shall be divided into five sections and that each section shall be presided over by one of the vice presidents of the council. The following is a list of the several sections with the subjects assigned to each:

Section I, seamen.—To this section are referred all questions relating to the civil, penal, social, and technical regulations relating to the contract of engagement of sailors, shipping articles, regulations of work, employment agencies, sailors' homes, hospitals for sailors, nautical instruction, schools, and licenses for officers, etc.

Section II, navigation.—This section considers the following subjects: Regulation of nautical management, inspection of ships, safety at sea, hygienic conditions on board vessels, tonnage, pilotage, etc.

Section III, commercial construction.—To this section are assigned economic questions, questions relating to navigation lines, aid to the merchant marine, subventions to postal services and marine brokerage.

Section IV, sea fisheries.—To this section is assigned a variety of matters relating to this general subject.

Section V, pleasure navigation.

Every member of the superior council may belong to two or more sections except that ex officio members may belong to all. An assistant chief of bureau or a clerk of the central office of the Under Secretary for the Merchant Marine is assigned to each section for service as recording secretary, while an administrator of the maritime inspection performs the duties of the secretary of the entire council.

Each section, in matters over which it has exclusive jurisdiction, or two or more sections having joint jurisdiction, shall consider questions submitted by the Under Secretary for the Merchant Marine and shall submit to the superior council meeting as a committee of the whole a report on each of the questions and proposals.

Every member of the superior council may be admitted to the session of each section either upon his own request or upon an invitation by the president of the section.

In regard to frequency of meetings, the decree provides that the superior council shall meet as a committee as the whole at least

once each year. It is provided, also, that members of the superior council may be represented by proxy at all times in the case of section meetings, but only in exceptional cases at the meetings of the entire council.

JAPAN.

The administration of the navigation laws of Japan is concentrated in the Mercantile Marine Bureau of the Department of Communications. The work of the bureau includes the registry and inspection of vessels, the registration and shipping of seamen, the examination and licensing of officers and pilots, the investigation of shipping casualties, marine inquiries, and lighthouses and buoys. In addition, this bureau has direct control of the lines receiving subsidies and subventions and, under the subsidy laws of Japan, has considerable authority in such matters as the frequency of service, routes, rates, form of financial reports, etc., of the subsidized lines. It is clear, therefore, that there is vested in this bureau a number of functions which in other countries are distributed among several bureaus.

At the head of the Marine Bureau is a director, who has under his jurisdiction a number of local maritime officials. There are 8 local maritime offices in the principal ports and 14 sublocal maritime offices in the lesser ports. In addition, officials of the smaller cities, towns, and villages are empowered under the laws of Japan to perform many of the duties assigned in the larger ports to local and sublocal maritime offices.

APPENDIXES.

Appendix A.—GROSS-TONNAGE RULES OF UNITED STATES.

The measurement rules of the United States provide in general that the gross tonnage of a vessel shall include "the entire internal cubical capacity" ascertained by the Moorsom system in a manner prescribed by statute. Specifically stated, the spaces included in the measurement, and thus in the gross tonnage, are as follows:

1. The entire space under the tonnage deck and between the tonnage and upper decks.

2. The space occupied by hatchways in excess of one-half of 1 per cent of the vessel's gross tonnage exclusive of the tonnage of hatchways.

3. Any "break, poop, or any other permanently closed-in space on the upper deck available for cargo or stores or for the berthing or accommodation of passengers or crew." What constitutes a closed-in space is defined in the manner explained above. Moreover, the law of 1865 provides that the passenger accommodations in the tiers of superstructures over the first tier above the upper deck shall be exempted from measurement.

The gross tonnage rules of the United States exempt the following spaces from measurement:

1. Double-bottom water-ballast spaces not available for cargo, stores, or fuel and the spaces between the frames and the floor beams.

2. Spaces under the shelter deck and in the poop, forecastle, and bridge, when not permanently closed in.

3. Passenger accommodations in tiers of superstructures over the first tier above the upper deck.

4. Hatchways up to one-half of 1 per cent of the vessel's gross tonnage.

5. Galleys, bakeries, toilets, and bathhouses above decks.

6. Spaces above decks occupied by the ship's machinery or for the working of the vessel.

7. Light and air and funnel space over the engine and boiler room to the extent that such space is above the upper deck or the "shelter deck" when that is taken as the uppermost full-length deck, except when special request is made by the shipowner to have the space measured.

8. Domes and skylights, companionways (except portion used as smoking room) and ladders and stairways located in exempted spaces.

9. Open spaces occupied by deck loads.

Appendix B.—GROSS-TONNAGE RULES OF GREAT BRITAIN.

The measurement rules now in force in Great Britain include the following spaces within gross tonnage:

1. The space between the upper deck and the floor of the hold, with the exception of certain minor exempted spaces included within hatchways, companionways, domes, and skylights, and spaces between ribs and floor beams in the case of certain vessels.

2. The spaces within any "break, poop, or any permanent closed-in space on the upper deck available for cargo or stores or for the berthing or accommodation of passengers or crew." The meaning given to the words "permanent closed-in" by the British courts, and consequently by the Board of Trade, has been explained above. Whenever the poop, forecastle, or any superstructure is inclosed according to the requirements of the British rules, the space is measured and included within the gross tonnage. The space under a shelter deck is not included in the measurement, if the openings in the shelter deck and in the bulkheads subdividing the space between the shelter and upper decks fulfill the requirements of the regulations prescribed by the Board of Trade in accordance with the decision of the House of Lords in the *Bear* and other cases. If cargo is carried in spaces which have the openings stipulated by the rules and which are thus exempted from measurement, the actual space occupied by the cargo is measured. The space thus occupied by "deck cargo" is not added to the vessel's gross or net tonnage, but is added to the tonnage upon which light dues or other tonnage taxes are collected.

3. The space occupied by hatchways is measured and the part of this space in excess of one-half of 1 per cent of the vessel's gross tonnage exclusive of hatchways is added to the gross tonnage of a vessel.

The following spaces are exempted from measurement, and are thus not included in the gross tonnage under the British rules:

1. Superstructures not permanently inclosed, that is, superstructures having the openings prescribed by the rules.

2. Spaces under the shelter deck, provided the shelter deck and the bulkheads subdividing the space between the shelter deck from the upper deck have the openings prescribed by the Board of Trade rules.

3. Any closed-in space or spaces solely appropriated to and fitted with machinery and the wheelhouse for sheltering the man or men at the wheel, if not larger than required for such purposes.

4. Any erection on the upper deck of vessels fitted for the shelter of deck passengers on short voyages. The exemption of this space from measurement, however, is admissible only by special directions from the Board of Trade. When claim is made by the vessel owner for exemption of these spaces, the surveyors must apply to the Board of Trade for instructions.

5. The cookhouse and bakeries, when fitted with ovens, and used entirely for these purposes, and the condenser space, provided the cookhouse and bakeries and condenser space, respectively, are not larger than are required to shelter the cook when employed at his

6. Toilets of reasonable size and number for officers and crew. In the case of passenger vessels, a toilet exempted from measurement is allowed for each 50 persons, but not more than 12 toilets are exempted.

7. The light and air and funnel spaces above the machinery compartments, unless the owner of the vessel requests the inclusion of these spaces within the measurement.

8. Of the space included within hatchways, one-half of 1 per cent of the gross tonnage of the vessel exclusive of hatchways is omitted from the gross tonnage.

9. The spaces within the double bottom used for water ballast. If such spaces are used or are available for the cargo, stores, or fuel they are measured and included in the gross tonnage.

10. The spaces between the frames or ribs of a vessel and between the floor beams. The breadth of the vessel is its width between the inner edges of its frames or between the inner faces of the inner side plating. The depth of a vessel is measured upward from the upper side of the floor timber of beam "at the inside of the limber's strake," that is, next to the keelson at the center line of the vessel.

11. Companionways, except such portions as are used for smoking rooms. Ladders and stairways in exempted spaces.

12. Domes and skylights.

Appendix C.—COMPARISON OF THE GROSS TONNAGE RULES OF GREAT BRITAIN, THE SUEZ CANAL CO., GERMANY, AND THE UNITED STATES.

The provisions of the several rules regarding spaces included in measurement are as follows:

1. In each set of rules gross tonnage is assumed to include all parts of a vessel that are permanently inclosed. The capacity of such spaces is determined by Moorsom's measurement system applied with but slight variation under the several rules.

2. In each case the spaces under the tonnage deck and between the tonnage and upper decks are included in gross tonnage.

3. Hatchways in excess of one-half of 1 per cent of the gross tonnage, exclusive of hatchways, are included in the tonnage.

4. In theory closed-in spaces above the upper deck are included in the measurement and tonnage and open spaces are exempted. Measurement rules and practice, however, vary as regards these spaces.

The provisions in the four sets of gross tonnage rules under consideration in regard to spaces exempted from measurement may be compared as follows:

1. Double-bottom spaces used for water ballast are exempted from measurement, unless (in the case of the national but not the Suez Rules) they are available for cargo, stores, or fuel. The methods of measurement are such as to exempt spaces between the ship's frames and its floor beams.

2. The same below-deck spaces are included in all four codes of measurement rules.

3. The application of the Moorsom system of measurement varies slightly with the different rules and the under-deck tonnage of the

MEASUREMENT OF GROSS TONNAGE UNDER THE MEASUREMENT RULES OF GREAT BRITAIN, THE SUEZ CANAL CO., GERMANY, AND THE UNITED STATES.

Portion of vessel.	United Kingdom.	Suez Canal.	Germany.	United States.
Forecastle.....	Measured if "closed in" and available for cargo, passengers, crew, or stores; exempted if "open" or not available for cargo, passengers, crew, or stores.	Measured if "closed in" under national and Suez rules; partly exempted if "open" under national rules, but "closed in" under Suez rules. Suez definition of "closed-in" spaces stricter than in United Kingdom and Germany.	Same as United Kingdom.....	Same as United Kingdom. ^a
Poop or break.....	do.....	do.....	do.....	Do. ^a
Bridge space.....	do.....	do.....	do.....	Do. ^a
Side houses.....	do.....	do.....	do.....	Do. ^a
Deck houses.....	do.....	do.....	do.....	Do. ^a
Spaces for anchor gear, steering gear, and capstan.....	Exempted if above decks; measured if below decks.	Measured.....	do.....	Exempted.
Wheelhouse.....	Exempted.....	do.....	Exempted.....	Measured.
Chart, lookout, and signal houses.....	Measured.....	do.....	Measured.....	Do.
Boatswain's stores.....	do.....	do.....	do.....	Same as United Kingdom.
Donkey engine and boiler rooms.....	Measured if below decks. Measured if above decks and connected with engine room; exempted if not so connected.	do.....	Same as United Kingdom.....	Do.
Hatchways.....	Exempted up to one-half per cent of gross tonnage; excess is measured.	Same as United Kingdom.....	do.....	Measured.
Sail room of sailing vessel.....	Measured.....	do.....	Measured.....	Same as United Kingdom.
Galleys, cookhouses, condenser spaces, and bakeries.....	Exempted if above decks; measured if below decks.	do.....	Same as United Kingdom.....	Exempted.
Skylights and dome.....	Exempted.....	Owner given option under Danube rule, but if measured he forfeits certain exemptions; if German rule is applied, they are measured.	Exempted.....	Owner given option for entire space above upper deck.
Light and air spaces above engine room.....	Owner given option for portion of space above upper deck.	Same as United Kingdom.....	Same as United Kingdom.....	Same as United Kingdom.
Companion houses.....	Measured if used as smoking room or for other special purpose; otherwise exempted.	do.....	do.....	Do.
Passageways.....	Measured when serving measured spaces.	do.....	do.....	Do.
Toilets, lavatories, and bath-rooms.....	Above decks 1 toilet for every 50 passengers, not exceeding a total of 12; and those used by the crew and officers are exempted. Those below decks are measured.	Measured.....	do.....	Measured.
Crew and officers' quarters.....	Measured.....	do.....	Measured.....	Measured.

Superstructures above first deck that is not a deck to the hull.	Treated the same as the first tier of superstructures.	Measured if "closed in" under the national and Suez rules; portions in way of side openings are exempted if "open" under the national rules, but "closed in" under Suez rules. Exempted if "open".....	Same as United Kingdom.....	Cabins and staterooms are exempted.
Shelters for deck passengers on short voyages. "Shelter deck" spaces.....	Exempted with consent of Board of Trade. Exempted if "open" according to court decision and Board of Trade instructions. Shelter decks are ordinarily exempted.	Measured if "closed in" under national and Suez rules; portions in way of side openings are exempted if "open" under the national rules, but "closed in" under Suez rules. The presence of cargo requires measurement forever thereafter. Exempted..... Measured..... Exempted..... Measured.....do.....	Exempted with consent of Bureau of Registry. Same as United Kingdom..... Exempted..... Measured..... Same as United Kingdom..... Measured.....do.....	Exempted with consent of Commissioner of Navigation. Same as United Kingdom. Exempted. Not measured. Same as United Kingdom. Measured. Do.
Deck loads.....	Added to net tonnage for tonnage taxation. Measured.....	Exempted.....	Exempted.....	Exempted.
Water-ballast tank (not double bottoms). Double bottoms.....	Exempted if used exclusively for water ballast. Measured.....do.....	Exempted..... Measured.....do.....	Same as United Kingdom..... Measured.....do.....	Same as United Kingdom. Measured. Do.
Between-deck space. Spaces under tonnage deck.....				

^a Prior to the issuance July 13, 1915, by the Commissioner of Navigation, of revised rules for the measurement of vessels, the definition of "closed in" was stricter in the United States than in the United Kingdom.

^b Prior to the issuance July 13, 1915, by the Commissioner of Navigation, of revised rules for the measurement of vessels, the practice was to measure "shelter deck" spaces unless "open" according to rules of Commissioner of Navigation.

Appendix D.—DEDUCTIONS OTHER THAN FOR PROPELLING POWER UNDER THE MEASUREMENT RULES OF GREAT BRITAIN, THE SUEZ CANAL CO., GERMANY, AND THE UNITED STATES.

Portion of vessel.	United Kingdom.	Suez Canal. ^a	Germany.	United States.
Spaces for anchor gear, steering gear, and capstan.	Not deducted if above decks, as they are exempted from measurement. Deducted if below decks.	Deducted if above deck; not deducted if below decks.	Same as United Kingdom.	Same as United Kingdom.
Wheelhouse.	do.	do.	do.	Do.
Chart, lookout, and signal houses.	Deducted.	do.	Deducted.	Deducted.
Sail room on sailing vessels.	Deducted up to 2½ per cent of gross tonnage.	Not deducted.	Same as United Kingdom.	Same as United Kingdom.
Boatswains' stores.	Deducted.	do.	Deducted.	Deducted.
Donkey engine and boiler room.	If connected with engine room, it is deducted as part of the machinery space; if above decks and not so connected, it is not measured; in all other cases if connected with main pumps of ship it is deducted. Not deducted if above decks, as they are exempted from measurement. Deducted if below decks.	If connected with engine room, it is deducted as part of the machinery space; if connected with pumps, steering gear, anchor gear, or other auxiliaries it is deducted, but it is not deducted if used for hoisting cargo. Deducted when used exclusively for crew and officers.	Same as United Kingdom.	Same as United Kingdom.
Galleys, cookhouse, and bakeries.	Portions above decks deducted as part of machinery space if owner desires. Spaces below decks are deducted as part of machinery space.	Spaces above decks are deducted in entirety under Danube rule as part of machinery space if owner desires, and are always deducted if German rule is applied. Spaces below deck are deducted as part of machinery space.	Deducted in entirety as part of machinery space.	Spaces above decks are deducted in entirety as part of engine room if owner desires. Spaces below decks are deducted as part of engine room.
Light and air spaces above engine room.	Deducted when serving deducted spaces exclusively.	Not deducted unless fitted with lockers, hammocks, etc., for use of crew or officers, and serving crew or officers' quarters. Those used exclusively by crew and officers are deducted.	Deducted when serving crew or officers' quarters exclusively.	Deducted when serving deducted spaces exclusively.
Passageways.	Above decks 1 toilet for every 50 passengers, not exceeding a total of 12, and those used exclusively by crew and officers are exempted from measurement. Deducted if below decks and for exclusive use of crew and officers.	Same as in United Kingdom.	Same as in United Kingdom.	Same as in United Kingdom.
Toilet or lavatories and bath-rooms.	Deducted (minimum of 120 cubic feet and 15 superficial feet).	Deducted, with exception of those of master, purser, clerk, stewards, and cooks in passenger steamers, etc. Not deducted.	Deducted (minimum, 3.5 cubic meters and 1.5 superficial meters).	Deducted (minimum, 72 to 100 cubic feet and 12 to 16 superficial feet).
Crew and officers' quarters.	Deducted.	Deducted, if actually occupied by doctor.	Deducted.	Deducted.
Master's cabin.	do.		do.	Do.
Doctor's cabin.				

Deck loads.....	Added to net tonnage in special memorandum for tonnage taxation. Deducted, if used exclusively for water ballast. Not deducted, if used exclusively for water ballast, as they are then exempted from measurement. Deducted as part of machinery space if used for fuel oil.	Not measured..... Not deducted..... Not deducted, as they are exempted from measurement.	Not measured..... Same as United Kingdom..... do..... ,	Not measured. Same as United Kingdom.
Water-ballast tanks (not double bottoms).				
Double bottoms.....				

^a The following and all other general deductions may not in the aggregate exceed 5 per cent of the gross tonnage for Suez navigation. The 5 per cent does not include the light and air spaces above the engine room. In the United Kingdom, Germany, and the United States the national rules provide no maximum limit other than that the spaces deducted shall be reasonable in size for their intended purpose.

^b On vessels built since Nov. 4, 1915, a minimum of 120 cubic feet and 16 superficial feet.

Appendix E.—CLASSIFICATION SOCIETIES.

INTRODUCTORY.

At the present time there are at least nine classification societies namely: The American Bureau of Shipping, in the United States; Lloyd's Register of British and Foreign Shipping and the British Corporation for the Survey and Registry of Shipping, in England; Bureau Veritas, in France; Germanischer Lloyd, in Germany; Veritas Austro-Ungarico, in Austria-Hungary; Norske Veritas, in Norway; Registro Nazionale Italiano, in Italy; and Veritas Hellene, in Greece. Japan also has recently taken steps looking toward the formation of a Japanese classification society.

The classification of ships has an almost official character. In Great Britain the Board of Trade gives to approved classification societies (Lloyd's Register, the British Corporation, and the British Committee of the Bureau Veritas) the privilege of fixing the load lines required by the act of 1876. In France the law of April 17, 1907, provides that vessels which have obtained a first-class rating (*la première cote*) from a classification society recognized by the minister of marine may be exempted from the inspection which is usually required before a vessel is placed in service, and likewise from the verification of the maximum load line if they have obtained a freeboard certificate from one of these societies. The decree of September 5, 1908, recognized Lloyd's Register and Bureau Veritas, while the decree of September 21, 1908, approved the freeboard rules prepared by the latter bureau.

Two classification societies have special prominence and exercise an international influence, namely, Lloyd's Register and Bureau Veritas. These two societies are widely known because they publish lists of maritime losses. This is not, however, their chief activity, the principal function of these societies being the classification and rating of ships.

The method of classification varies according to the society. The present system of classification used by Lloyd's Register, which has evolved gradually from the system instituted in the year 1834 and is typical of the prevailing methods, is fully described in the following extracts from Kirkaldy's recent work on British Shipping: Its History, Organization, and Importance, page 226 et seq.:

Then the letter A denoted a ship of the first class, which had not passed the prescribed age, and had been kept in a high state of efficiency; that is, a ship capable of undertaking a voyage to any part of the world. The diphthong Æ denoted a ship in the second rank of the first class. Such a ship had got beyond the prescribed age and had been sufficiently overhauled to be restored to the highest class, but remained in a condition capable of carrying with safety dry or perishable cargoes. The letter E stood for the second class. Ships in this class, though not fit for the conveyance of dry or perishable goods, could trade in any part of the world, and carry cargoes not liable to sea damage. A third class was denoted by the letter I, and was conferred on ships which were not considered fit to undertake long voyages, nor to carry dry or perishable goods.

The numerals 1 and 2 were added to the letter, and signified the state of the ship's equipment, i. e., anchors, cables, stores, etc. It is unnecessary here to tabulate all the modifications that classification has undergone since 1834. But in the year 1870 it is important to note that the rules for the construction of iron ships were completely redrafted, and the 100 A1 class was instituted. "It is to be distinctly understood that the numerals prefixed to the letter A do not signify terms of years, but are intended for the purpose of comparison only: the A character assigned being for an indefinite

period, subject to annual and periodical survey as hereafter described." ¹ In the year 1888 rules and regulations for the construction of steel vessels were drawn up, and these had from time to time to be modified. The present Rules and Regulations of Lloyd's Register were drawn up in the year 1909, and embody regulations to meet every possible contingency.

The process of obtaining a rating has been clearly described by H. J. Cornish, chief ship surveyor of Lloyd's Register, in the following extract from a paper read before the Institution of Naval Architects.²

In the first instance the plans of vessels and of the boilers of steamers for which a society's classification is sought are sent for approval. Clearly, if a vessel is intended for general trade, no class can be assigned unless she conforms to the standard of strength set up by the rules as requisite for vessels intended to go anywhere and do anything—though how that strength is attained may be immaterial. If, however, a vessel is intended for a special trade, she can receive a class for that trade, if her scantlings and arrangements are considered suitable, quite irrespective of the rules governing the classification of general traders.

It is also well known that the construction of the vessels, including the machinery and boilers of steamers, then proceeds from start to finish under the society's inspection, no steel being used which has not been produced at approved works, and tested at the manufactories by the surveyors to Lloyd's Register. For the examination of large forgings to be employed in the structure of the vessels, the society employs specially trained and experienced men, who carefully inspect them while in process of manufacture, in order to detect defects (if they exist) which could not be observed in their finished state after delivery. Similarly, all heavy steel castings are carefully tested before they are accepted for use in a classed vessel. The surveyors see that the equipment of anchors and chain cables is in accordance with the rules, and that they have been tested in accordance with statutory requirements at public proving houses, all of which are under the superintendence of the committee of Lloyd's Register. Beyond the statutory requirements, all cast-steel anchors are required to undergo special tests at the manufactory in the presence of the society's surveyors. Finally, detailed reports are sent to headquarters, where they are examined by the technical staff before being submitted to the committee with a view to classes being assigned.

In the beginning, the classification societies were information bureaux for insurance companies. They sought to classify the largest number of ships possible and to deliver to the insurance companies, in return for a commission the fund of information which they had been able to collect. To-day their clientele has changed. The societies sell their classification registers at so reasonable a price that every insurance company possesses one, and they do not depend on the revenue obtained from this source. The real clients of all classification societies are the shipowners who desire the rating in order to establish the quality of their ships and the shipbuilders who have contracted to build a ship of a certain definite rating. Classification is desirable as a means of securing a satisfactory insurance rate from the marine insurance companies.

The relations of classification societies with the various parties interested have, it is clear, become increasingly complex. They have to do first with the owner or builder who requires a rating; secondly, with the insurance company subscriber who seeks information; and thirdly, with the party who confines himself to consulting the society's register.

GREAT BRITAIN.

Lloyd's Register is the oldest of the classification societies. At the close of the seventeenth century a coffeehouse on Tower Street

¹ Lloyd's Rules.

² "The classification of merchant shipping," Transactions of the Institution of Naval Architects, 1909, p. 227.

in London, kept by one Edward Lloyd, became a common meeting place for underwriters and shipowners. The habit of meeting to discuss business or politics at a coffeehouse appears to have been introduced into western Europe from Constantinople about the middle of the sixteenth century, first in Venice and later in Paris and London. In France the coffeehouse has remained a club center down to the present. In England, after their first introduction, they became meeting places for various purposes, but with the lapse of time all this has changed.¹

The origin of this register has been well described by Kirkaldy in his recent work on "British shipping," in the following words:¹

The first mention of Lloyd's Coffee House occurs in the *London Gazette* in the year 1668. * * * Mr. Edward Lloyd gave his attention to attracting the shipping community, and his establishment became the great meeting place for underwriters and shipowners. From this circumstance the Coffee House became a convenient place to post information concerning both the movements of shipping, and the particulars of the build and equipment of individual ships. And from what at first was voluntarily supplied by an able and obliging caterer has evolved Lloyd's, an association of underwriters, and Lloyd's Registry of British and Foreign Shipping.

This term "Lloyd's" is very often the cause of some confusion, and it should be kept in mind that there are several distinct organizations embraced under this name. First in importance is Lloyd's Insurance Exchange. Contrary to the general impression, Lloyd's is primarily an association of underwriters, each of whom conducts his business according to his own views, just like any broker who is a member of any other exchange. For those views or for the business transacted by the individual underwriters, Lloyd's as a corporation is in no way responsible, except that candidates for election as members are required to satisfy the committee as to their means and in all cases to deposit in the names of trustees a sum of not less than £6,000 as additional security for liabilities incurred on account of marine and transport risks. For many years this practice has prevailed, and the total securities thus placed at the disposal of the committee of Lloyd's amount to over £4,000,000.

Lloyd's as a corporation and its executive committee have little to do with marine insurance. Their business is to conduct the affairs of Lloyd's in its corporate capacity, to supply and distribute shipping intelligence, and to guard as trustees the corporate funds and corporate property. In other words, Lloyd's is a great market for individual insurance.²

In September, 1696, Lloyd's News began to be issued three times weekly, but was suspended because of a political reference which offended the Government. Kirkaldy states that "its place was taken in 1726 by Lloyd's List, a journal which, with the exception of the official *London Gazette*, can claim to be the oldest existing newspaper in the world. The information available at Lloyd's as to the arrival and sailing of ships may have been a survival of an earlier practice. At any rate, in the year 1532 (23 Henry VIII, c. 7) arrangements were made for the publication in Lombard Street of notice of the sailings of ships.' It is interesting that these notices were published in Lombard Street, where a century and a half later Lloyd's was to have its headquarters."

The manner in which Lloyd's has developed is also described in the following extract from Kirkaldy:

From the system of shipping intelligence established by Lloyd, there has grown, under the direction of the great marine insurance corporation which bears his name, an organization for collecting and publishing information about the mercantile marine, which is one of the most perfect and world-wide institutions connected with commerce. * * *

The volumes now published annually by the Registry had a somewhat humble origin. That shipping people, especially underwriters, should have ready access to authentic information as to the character, build, and equipment of a ship, is a necessity of shipping business. The insurance or even the purchase of a ship may have to be arranged while she is away from port. It would appear at first sight a somewhat risky proceeding either to insure or purchase a vessel representing great capital value, without having the opportunity to make a thorough inspection, but with a register giving full particulars of the ship and her upkeep, as does Lloyd's, an underwriter or a purchaser is placed in possession of full information, and the necessity of inspecting is reduced to a minimum. Marine insurance would be a very burdensome business if, before taking a risk on a ship or on goods about to be shipped, an underwriter had to make inquiries as to the build, equipment, and upkeep of the vessel in question. In other words, with a growing foreign commerce, and a developing system of insurance for both vessel and cargo against the risks of the sea, it became increasingly necessary to contrive some means for ascertaining whether any given ship was seaworthy; and with this, prominence was given to the fact that there are ships of various qualities. Thus with records of this description began the work of classification, which though of a very primitive description at the outset, has developed into one of the most important organizations, safeguarding the interests alike of the shipbuilder, the ship-owner, the shipper of goods, and the underwriter. It was consequently realised that if lists were drawn up by a reliable authority, showing where and when and how a ship was built, and how she had been surveyed and repaired during her career, a great saving in time and anxiety would result to the shipping community. Apparently it was Edward Lloyd who first saw the advantage to his clients of having this kind of information available in convenient form. Whether he originated the scheme, or whether it was adapted by his clients from some method practised elsewhere, the fact is well established that at his Coffee House in Lower Thames Street, *Ships' Lists* were kept giving this special information.

Lloyd's Register, as it exists to-day, is a good illustration of the advantages of co-operative effort. It is interesting to practically every class of the shipping community to be able to ascertain the character of a given ship. By the establishment of a responsible committee, representing all these interests, it has been found possible not only to produce a register of shipping which, while giving all the needed details, can be easily kept up to date, but as necessary parts of the same organization there is a system of regulations and survey by means of which the manufacture of the structural and other materials, the work of constructing ships and their upkeep and repair during their careers, have become the duty of Lloyd's Register—the parent of, and in most cases working in association with, similar institutions throughout the world.¹

The dominant authority in Lloyd's Register consists of ship-owners and builders. Underwriters originally controlled the classification society, but this control was lost in 1835, and at the present time Lloyd's Register has no definite connection with Lloyd's Underwriters.

FRANCE.

The Bureau Veritas was organized in Antwerp in 1828 under the name of Bureau de Renseignements pour les Assurances Maritimes. Its establishment was due largely to a severe crisis which the French insurance-companies had undergone and its chief functions at the outset were the issuance of marine intelligence and the publication of a register under the name of the Lloyd français. The following year the organization took the name Bureau Veritas and was transformed

¹ Kirkaldy, *British Shipping: Its History, Organization, and Importance*, pp. 215-216.

into a classification society. In 1832 the headquarters of the society were transferred to Paris.

At first the society had to combat the influence of a register of the name of "Intégritas," which, however, was persuaded to retire as the result of a compromise. Later it had to defend itself against shipowners and shipbuilders who accused it of being an international society and won over various chambers of commerce to join in their protestations. In 1861 the Chamber of Commerce of Bordeaux succeeded in establishing a maritime register which did not disappear until 1888.

All this opposition has ceased. The Bureau Veritas is the great center in France for information on maritime navigation and is one of the two classification societies approved by the Ministry of Marine, the other being Lloyd's Register. While Lloyd's Register rates the largest number of ships, its clientele is chiefly English, hardly one-fifth of the vessels rated being foreign. A considerable proportion of the ships rated by the Bureau Veritas, on the other hand, are of foreign ownership.

UNITED STATES.

The only American institution that prescribes rules for the construction of ships is the American Bureau of Shipping. This organization was chartered in April, 1862, at New York, under the title "American Shipmasters' Association." The incorporators were, for the most part, men well known in the annals of American maritime underwriting, commerce, and shipping, and the purpose of the association, as stated in the act of incorporation, "was to collect and disseminate information upon subjects of marine or commercial interest, and to encourage and advance worthy and well-qualified commanders and other officers of vessels in the merchant service, and to ascertain and certify the qualifications of such persons as shall apply to be recommended as such commanders or officers, and to promote the security of life and property on the seas."

The title of the association was changed by authority of the court in September, 1898, to the American Bureau of Shipping. The association is a self-perpetuating body, the entire membership of which may not exceed 50.

The American Bureau of Shipping has a high standing among the leading American marine insurance companies, most of which decline outright to insure vessels that are too lightly built to meet the approval of this classification society, and thus be classed as a "safe risk."

The Federal Government formulates no specific rules for the building of vessels. The materials used and the manner of construction are passed upon by the local boards of United States steamboat inspectors when the latter are called upon to issue certificates of inspection. At the same time the rules and regulations of the United States Board of Supervising Inspectors (edition of Aug. 11, 1915), which guide United States inspectors in their examination of vessels, specifically approve of the rules of the American bureau, as follows (p. 229):

boilers, and engines, except ~~where~~ are otherwise provided for by these rules and regulations, may be accepted by the inspectors.

The rules of the American Bureau of Shipping were approved also by the United States Navy Department, after a naval board appointed for the purpose had examined and approved the rules throughout. In addition, these rules have been approved by the Board of Underwriters of New York, the Board of Marine Underwriters of Boston, and the Board of Marine Underwriters of San Francisco, and all vessels for the United States Coast Survey, Lighthouse Service, and Coast Guard are built according to these rules.

• GERMANY.

The Germanischer Lloyd, the classification society of Germany, was established in 1867 and modified in 1889. It publishes an annual register which gives detailed information concerning all vessels that are at present or that formerly were classified by the Germanischer Lloyd, as well as all other German vessels measuring 50 gross register tons and over, not including yachts.

The freeboard of all German vessels is required to be determined by the Germanischer Lloyd in accordance with article 6 of the Regulations of the See-Berufsgenossenschaft for steamers and article 5 of those for sailing vessels. The British Board of Trade recognizes the freeboard certificates issued by the Germanischer Lloyd not only for German vessels but also for those of other nationalities which are classed by them, so long as the nation in question has not yet promulgated rules of its own that are regarded by the British Government as equivalent.

By far the largest percentage of the ships classified by the Germanischer Lloyd are ships built and owned in Germany.

• NORWAY.

The classification society for Norway is the Norske Veritas, established in 1864 at Christiania by representatives of Norwegian ship and cargo insurance companies who recognized the need for a local organization which should procure an impartial classification for ships upon which insurance rates could then be based. At the present time the society is still virtually controlled by the underwriting interests of Norway, and has a high rating among the classification societies of the world.

Besides the surveys made by Norske Veritas, the Norwegian Government, by royal ordinance of March 29, 1906, accepts likewise the surveys made by Lloyd's Register, Bureau Veritas, the British Corporation, and Germanischer Lloyd.

• JAPAN.

Japan has no recognized national classification society, but it is understood that plans for the formation of one are being discussed at the present time. Japanese vessels are for the most part surveyed by Lloyd's Register and Bureau Veritas.

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