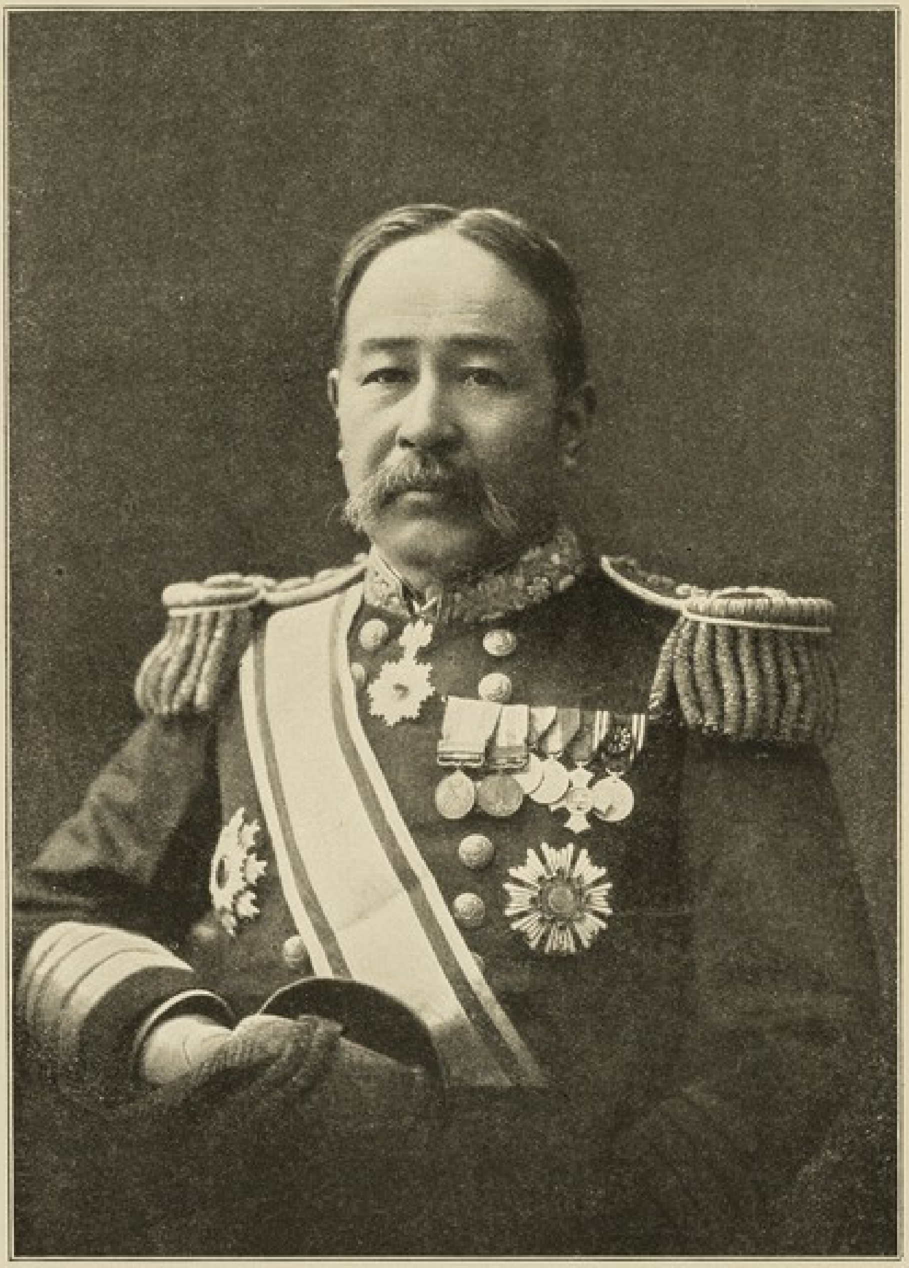
**Report on the Japanese naval medical and sanitary features of the Russo-Japanese war to the Surgeon-General, U.S. Navy, by Surgeon William C. Braisted**



HIS EXCELLENCY BARON Y. SANEYOSHI.

Medical director general, Imperial Japanese Navy.

# REPORT

ON THE

# JAPANESE NAVAL MEDICAL AND SANITARY FEATURES OF THE RUSSO-JAPANESE WAR TO THE SURGEON-GENERAL, U. S. NAVY

BY

SURGEON WILLIAM C. BRAISTED
U. S. NAVY

Tokyo, July 15, 1905

WASHINGTON
GOVERNMENT PRINTING OFFICE
1906

Navy Department,
*Washington, January 10, 1905.*

Sir: You are hereby detached from duty on board the U. S. S. *Ohio*, and will report immediately, by letter, to the Office of Naval Intelligence, Navy Department, for duty.

Take passage in the steamer *Manchuria*, of the Pacific Mail Steamship Line, sailing from San Francisco, Cal., on or about Saturday, January 21, 1905, for Yokohama, Japan; and upon your arrival at Yokohama you will proceed to Tokyo and report in person to the United States minister to Japan, and by letter to the commander in chief of the United States Asiatic Fleet, for special duty, comprising observations in connection with the naval medical and sanitary features of the Russo-Japanese war.

The officer in charge of the navy pay office, San Francisco, has been instructed to secure your transportation in the steamer sailing the 21st instant or Yokohama.

This employment on shore duty beyond the seas is required by the public interests.

Respectfully,

Paul Morton, *Secretary.*

Surgeon W. C. Braisted, U. S. Navy.

# CONTENTS.

# JAPANESE NAVAL MEDICAL AND SANITARY FEATURES OF RUSSO-JAPANESE WAR.

---

TOKYO, JAPAN, *15 June, 1905.*

SIR: In obedience to an order from the Secretary of the Navy, dated January 10, 1905, a copy of which is appended, I have to state that I was detached from the U. S. S. *Ohio*, at San Francisco, on January 12, 1905, and on January 28, 1905, proceeded by steamer *Manchuria* to Japan, reporting to the American minister at Tokyo on February 16, and by letter to the commander in chief of the Asiatic Station, for duty comprising observations and report on naval medical and sanitary matters affecting Japanese operations in the present Russian-Japanese war.

Upon my arrival at Tokyo certain requests were presented in my behalf by the American minister to the Japanese Government to enable me to carry out my instructions. These requests were all kindly granted except two very important ones, namely, (1) a request to spend a short time at the front with the army or navy under actual fighting conditions, to note the care of the sick and wounded, the organization of first aid, the arrangement and management of field hospitals, medical equipment, methods of preventing disease, hygiene, etc.; and (2) a request to visit at least one large man-of-war in commission to study the provisions for the care of the sick, first aid, transportation of wounded, care of wounded or disabled in actual battle, and the general organization of the medical corps afloat. While these refusals were a severe disappointment, they really were a consistent carrying out of a policy that the Japanese have wisely adhered to from the beginning of the war. The great kindness and courtesy shown in every other direction fully demonstrated their desire to do everything possible to aid in the work projected.

However, much of the information desired has been obtained indirectly in other ways. I wish particularly to express my appreciation of the great kindness of Baron Saneyoshi, and of the naval medical corps generally. Everything that could be done to make clear a very difficult subject was done, and even my welfare and comfort looked out for most carefully.

In attempting to judge the position of the Japanese medical corps to-day it is necessary to remember that the navy is comparatively young, and so greater credit is due on account of the rapid advances made to such an eminent position as it now holds. While the position of the Japanese on an island group has made them always a seafaring people, still nothing worthy of the name of a navy can be mentioned until about the time of the last shogun. Before this time the more powerful rulers had war ships of the galley type. About

1865 a determined effort to found a navy of higher type began, and a number of British naval officers and men were obtained as a nucleus for instruction, and some of the younger Japanese were sent abroad to study seamanship at various places. After the political disturbances of the country had quieted down, in 1873, the real building of a navy began, the naval college was inaugurated, and training ships and squadrons sprang into being. The increasing navy soon felt a need for skilled medical service, and from this necessity grew the present medical corps. The old-time Japanese physicians took up their profession at will by reading Chinese medical literature or studying with older Japanese medical men. As there were no medical schools in Japan, it was found necessary to begin an army, and later a navy, medical school for the instruction and training of physicians and surgeons. So about thirty-four years ago was founded the Navy Medical School at Tokyo.

This medical school, unlike our own, gives a complete medical education, and many prominent medical men in the service have received their education here. While it is true that many of the members of the corps have received their education in Germany, some in England, France, and America, yet many have had their complete course at their own Navy Medical School.[a]

Thus, within a period of forty years has grown and matured the present medical organization with which we are attempting to deal, with its well-equipped hospitals, its many brilliant surgeons, its medical school, its hospital ships, and all the many modern details required for the care of the health and well-being of a navy of 40,000 men. This introduction is made, as before stated, in order that a due appreciation of the difficulties overcome may add to the well-deserved merit of this most estimable corps of medical workers. All whom I have met are industrious, intelligent, and zealous workers in their special field.

While waiting in Tokyo for official permission to visit the hospital ships and naval hospitals, I was, through the kindness of the medical director-general of the navy, permitted to visit the many prominent institutions of learning and science.

In considering Japanese institutions, whether military or civil, it is necessary to remember that the Japanese are struggling from a lower to a higher civilization, and it becomes, therefore, a more difficult problem to make just comparisons with the older European civilizations. Also, one must avoid with care the too prevalent tendency to idealize everything Japanese. We are trying to see things and describe them exactly as they are and without adding anything on account of the rather remarkable advances made by this people during the last fifty years. The Japanese themselves look at their present state with a very conservative attitude, and are often astonished at the elaborate praise and almost erotic enthusiasm of the foreigner passing through the country. I have heard an American medical gentleman, on being shown one of the poorest, dirtiest, and illy equipped of Japanese hospitals, go into raptures over the institution, using an abundance of superlatives that astonished and puzzled the Japanese surgeon showing him about These remarks are made

---

[a] Note by Director-General Saneyoshi: "Gives" should be "used to give a complete course until twelve years ago; since then they enter as navy surgeons by competitive examination after they have qualified as a medical practioner."

because we find it impossible in this report to find only absolute perfection. There are many defects of organization, construction, and equipment of which the Japanese are perfectly aware, say nothing about to foreigners, and which they are earnestly striving to correct.

Japan has been able to roam the world over, to study the institutions of all people, and assimilate and copy what has seemed best to her from each nation. They have started with a clear field, and by adopting carefully the best, have quickly put themselves on a high plane. Very little has been invented or organized de novo. Her military organizations are largely drawn from the German, to some extent from the English and French, and very slightly from the American. The people are intensely patriotic; they have just emerged from a feudal condition, where strict obedience was inculcated, with the most profound reverence for law and official power, a condition where severe punishment was meted out quickly to the offender. The result is to-day that in the army and navy a discipline exists which has no parallel. The members of these organizations are absolutely to be depended on, and their patriotism keeps them constantly at the highest point of efficient activity. If men are told not to drink, they obey; if they are told by their officers how to take care of their bodies, their clothes, their selection of food, they follow implicitly their instructions; hence we see an immense organized body moving as by magic; hence comes freedom from disease caused by careless living. The Japanese as a nation are characterized by a certain cleanliness, both of body and surroundings, so that here again is a cause of freedom from filth-breeding diseases. At the head of the affairs of the nation are men of superior intelligence and education; they make wise laws and their directions are followed with implicit faith.

Again, we must remember that for nearly ten years the Japanese have been preparing for the present struggle, organizing, studying, planning, drilling, and gathering stores in large quantities against a war that was sure to come.

The Japanese have been aided largely by good fortune; thus their fertile islands as a base and home have been untouched and their lines of communication to the battle fields have been easy and uninterrupted. All during the war things move on in Japan almost as smoothly as though there was no war going on—a war that is taxing the very life of the Government.

They have the method of enlistment by conscription, but this is supplemented by a most rigid physical examination, and no weak or impaired personnel is allowed. Thus they start with forces in perfect health, with a personnel, not tall, but strong, sturdy, intelligent, and active; men who are accustomed to but few luxuries, who have always lived mostly in the open air, whose bodies have not been undermined by alcoholic excesses; men quiet in demeanor, but determined, active, and capable. These are the circumstances that have added so materially to the wonderful campaigns of the Japanese.

What, then, can we in the Navy learn from the Japanese in the present war? First, and most important, discipline and unwavering obedience to instructions. The Japanese officer as a rule commands the respect of his men; they look up to him and follow absolutely his directions. The Japanese officer is dignified but approachable, and his demeanor toward his inferiors is kind, interested, and tolerant.

The American recruit is, as a rule, bright, intelligent, and loyal, but extremely difficult to control, especially in matters affecting his own person. He delights in doing all sorts of dare-devil tricks that only too often end disastrously; he will drink water from almost any source, a ditch or well by the wayside; he delights to forage and commits all sorts of intestinal excesses and errors. In these things he is a law to himself, and only long training and much experience tend to change the aspect of his character.

Japanese organization is good, but in theory not superior to our own, but practically they excel us on account of their absolute adherence to orders.

There is but little else that we can learn at this time from the Japanese. Their hospitals are good for Japan, but fitted for the care of the Japanese only. Their institutions would not be at all satisfactory to our people, nor indeed could they be compared in anyway with the beautiful and efficient hospitals that are so marked a feature of almost every city of our States.

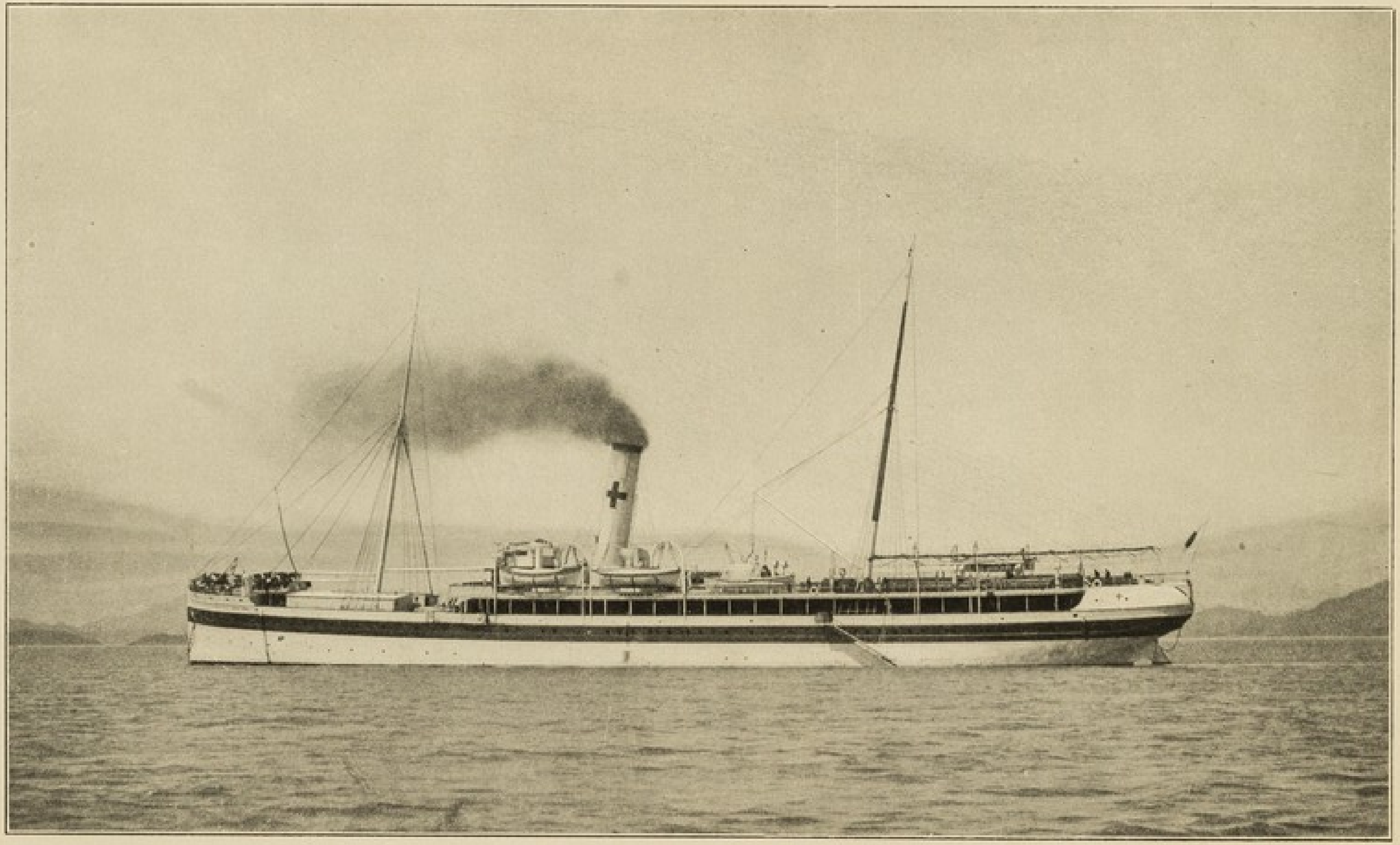
They are especially fond of surgery, but it is largely (in the army and navy) emergency surgery. They are gaining much experience and have much practice during this war, but there is little of what we look upon as higher surgery. Abdominal surgery does not flourish; there is but little of it being undertaken.

The medical corps of the Japanese navy probably excel us in pathology and bacteriology. They always have at each institution extensive, well-equipped, and actively working laboratories. They take much interest in the work, and it is easy to predict marked success shortly in experimental work of this character. The Japanese navy surgeon takes his profession very seriously, and is a hard and intelligent worker.

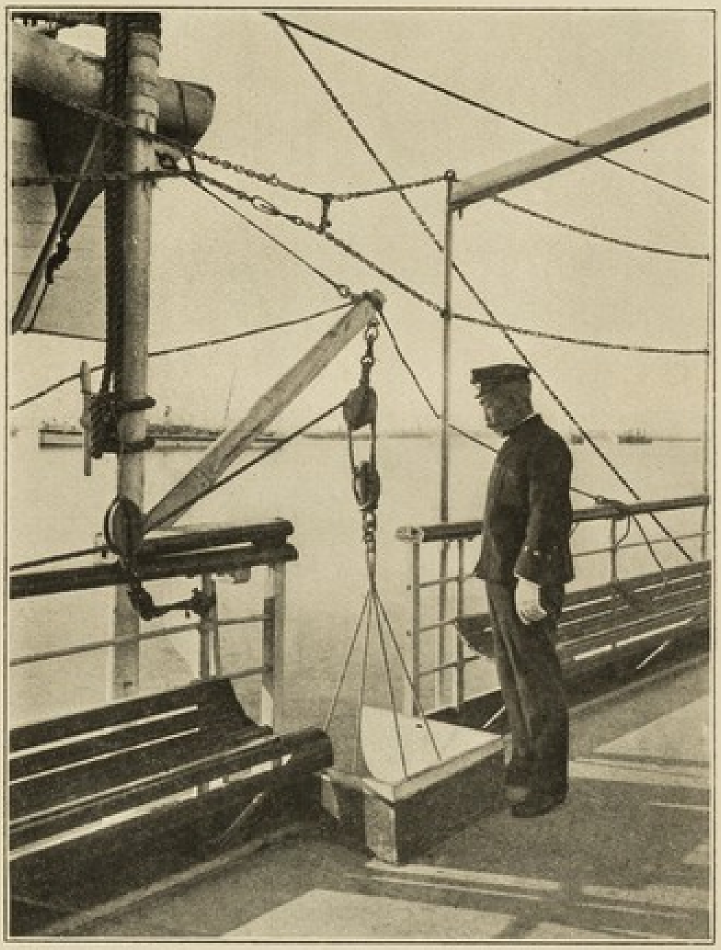
## HOSPITAL SHIPS.

The navy has two hospital ships, known respectively as the *Saikio Maru* and the *Kobe Maru*. They were both originally merchant vessels belonging to the Nippon Yusen Kaisha. They are sister ships and practically fitted out alike. During the Japanese-Chinese war the *Saikio Maru* was made into a converted cruiser and took part in the battle of the Yalu. The *Kobe Maru* was used during that war as a hospital ship. After the Japanese-Chinese war these ships were returned to the merchant service and fitted out again as hospital ships during the present Russian-Japanese war.

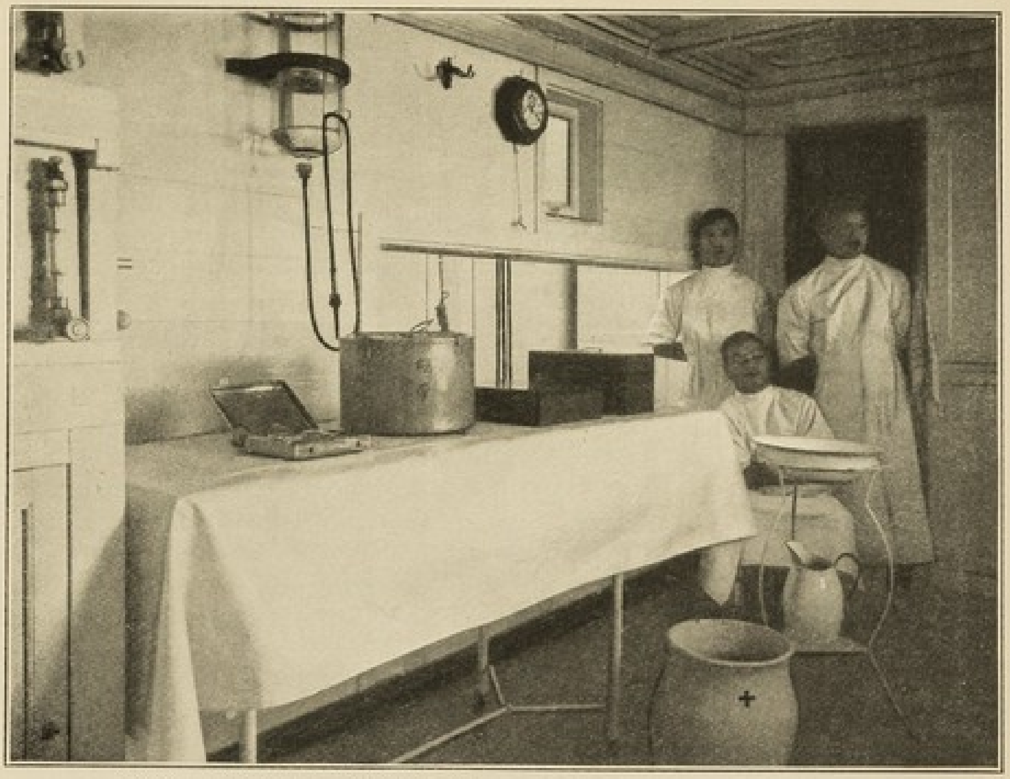
The *Saikio Maru* is a single screw steel ship of 2,978 tons, has a draft of about 20 feet and beam of 30 feet; length, 365 feet. She has four decks—a hurricane deck, an upper deck, a middle deck, and a lower deck. The hurricane deck presents nothing of unusual interest except the provision of a small steam launch and eight small 7-meter boats. In the series of pictures of the *Saikio Maru*, No. 3, will be found a hatch cut in the side of the hurricane deck to admit of swinging in a davit or whip. This hatch and davit are used in hoisting in patients on stretchers from small boats; and by being enabled to swing the davit and whip inboard when the upper deck is reached, the stretcher can be delivered on deck with great ease. There are two of these davits, one on each side of the ship aft, so that two patients can be taken in at once. An elevator is at hand to carry the patients below to the ward or room assigned. This scheme is worthy



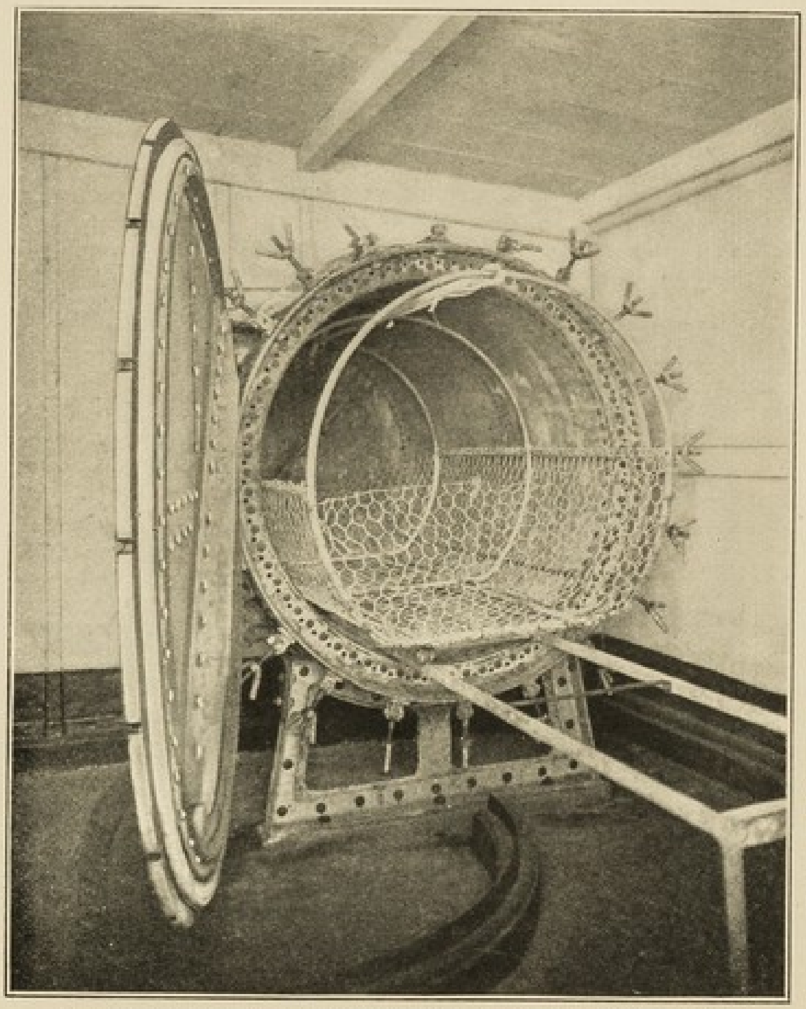
JAPANESE NAVAL HOSPITAL SHIP SAIKYO-MARU.



SAIKYO-MARU, SERIES NO 3. HATCH DEVICE ON HURRICANE DECK FOR HOISTING PATIENT ABOARD SHIP.



NAVAL HOSPITAL SHIP SAIKYO-MARU. DRESSING AND PREPARING ROOM.



NAVAL HOSPITAL SHIP SAIKYO-MARU. DISINFECTING APPARATUS.

of notice. The upper deck has on the port side from aft forward the dead room, reconstructed from the former closets of the merchant ship. This room is well shown in the series of photographs of *Saikio Maru* and *Kobe Maru*, No. 12, and while it is attractive, as shown in the picture, yet there are no provisions for keeping the temperature down. The room is appropriate in that it is remote, with least possible opportunity of causing annoyance or infection to the remainder of the ship.

The preparing room for patients for operation comes next. It is large and spacious, fitted with a white iron table, the walls of wood painted with white zinc paint, lighted by good ports and with an abundance of electric lights. There are hot and cold water sterilizers; a coil of steam pipes introduced into the hot-water sterilizer keeps the water at proper temperature. A sink and washstand are provided, and provisions are made for the stowing of dressings, operating garments, instruments, and solutions required in operations. Irrigating bottles suspended from the ceiling are at hand and the elevator shaft, on the inner side of the room, gives ease in transferring patients from the wards below for operation. This room opens forward into the operating room, quite a fair-sized room, about 13 by 7½ feet. The light is very good, being obtained both from the skylight above and the ports on the side. The walls are of wood, painted with white zinc paint, and the floor covered with linoleum. There is a good white enamel operating table, white enamel and glass instrument stands, and an instrument sterilizer. There is a surgeon's washstand, and hot and cold sterile water, with large irrigator suspended from the wall. There is an abundance of electric lights, both standing and portable. There seemed to be a good supply of modern instruments of all kinds in very good condition. The elevator is small, just large enough to admit of a patient on a stretcher, and is worked by one man by means of a hand ratchet. Forward of the operating room on the starboard side are several stateroom for medical officers; they are the same as the usual stateroom on steamers, comfortably furnished, with good electric light and plenty of light and air.

Next comes the mess room, which runs athwart ship. It is quite comfortable, with two mess tables and cushioned transoms. The medical officer in command presides at one table, and the other table is for the junior medical officers and paymaster. The deck house, forward of this, contains the paymaster's room and office and rooms for the engineer officer. A small lounging room for sick officers is also located here. The forward part of this deck house is taken up with the quarters of the captain. On the starboard side forward, between the deck house and the bow, is the disinfecting outfit in a wooden structure built on the deck. It contains a large sterilizer, as shown in the photographs of this series marked "11." The sterilizer is used not alone for the hospital ship, but also for sterilizing articles for torpedo boats and ships when needed. The sterilizer, as will be seen from the photograph, is quite large—about 7 by 5 by 4 feet. On the opposite or port side of the deck is the laundry, inclosed in a wooden structure. It contains a steam mangle, washer, and circular wringer. It is of sufficient size to do the washing for the ship—say 200 people. Aft on the port side are the senior medical officer's room, a stateroom of about the same size and fittings as the staterooms for the other medical officers, and aft of this the dispensary, well fitted up and fairly well stocked with drugs, with plenty of light for compounding and putting up drugs. There is also a room for the repair of surgical instruments, and emery wheels and outfit for sharpening instruments. Surgical instruments from the hospital ship or from the other ships may be sharpened or repaired here. As mentioned before, the supply of surgical instruments is quite extensive, of modern make, and in very good condition. The bacteriological laboratory occupies the room next aft and is particularly well stocked with all needed for this work, with an excellent Zeiss microscope, section cutters, etc. Many of the pathogenic germs were growing, and Surgeon Endo, who had charge, is doing much experimental work in this line. A small room contains the photographic outfit and is used as a dark room. In the stern of the ship, corresponding to the dead room, but on the port side, is a room used for keeping medical records, but on the *Kobe Maru* fitted as a sterilizing room for surgical dressings.

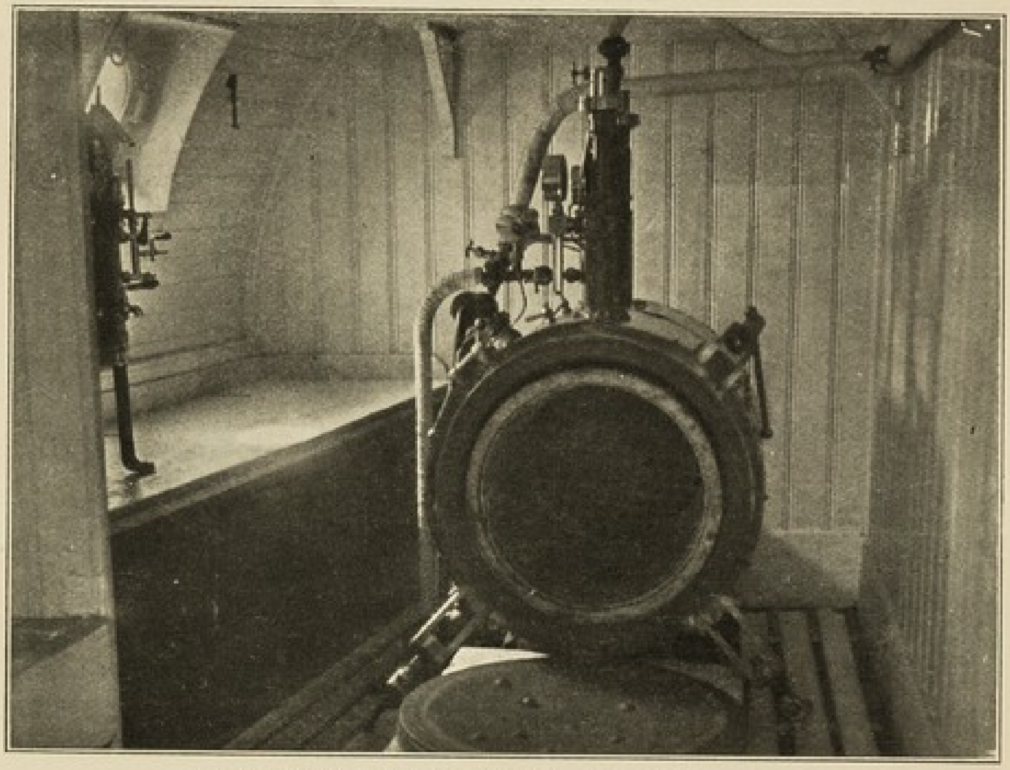
On the main deck are the two main wards—the surgical ward aft of the engine-room space and the medical ward forward. The surgical ward has the elevator to the operating room at hand for the transfer of patients from ward to operating room. The ward is very clean. The bunks are superimposed or double banked. They are made of wood and swing on pivots, which suspend them from heavy single wooden stanchions fore and aft. The bunk is built like a wooden box, with rather high sides. When fitted out with the Japanese mattress, quilted cotton-wool pads, blankets and sheets, they seem quite comfortable. Photographs Nos. 4 and 5 of both *Saikio Maru* and *Kobe Maru* show this construction very well. There are about 78 bunks in this ward. There are mess tables in the center of the ward. The ventilation is natural, there being no blowers or ventilating pipes for artificial ventilation. Sputa cups are used for the patients. The finish of the floors and surfaces is somewhat crude, but the ward seemed neat, clean, and sweet smelling.

The medical ward forward is built much in the same manner. The spaces between the rows of bunks are sometimes rather narrow, and it would seem somewhat crowded if all the bunks were full. There are about 72 bunks in the medical ward.

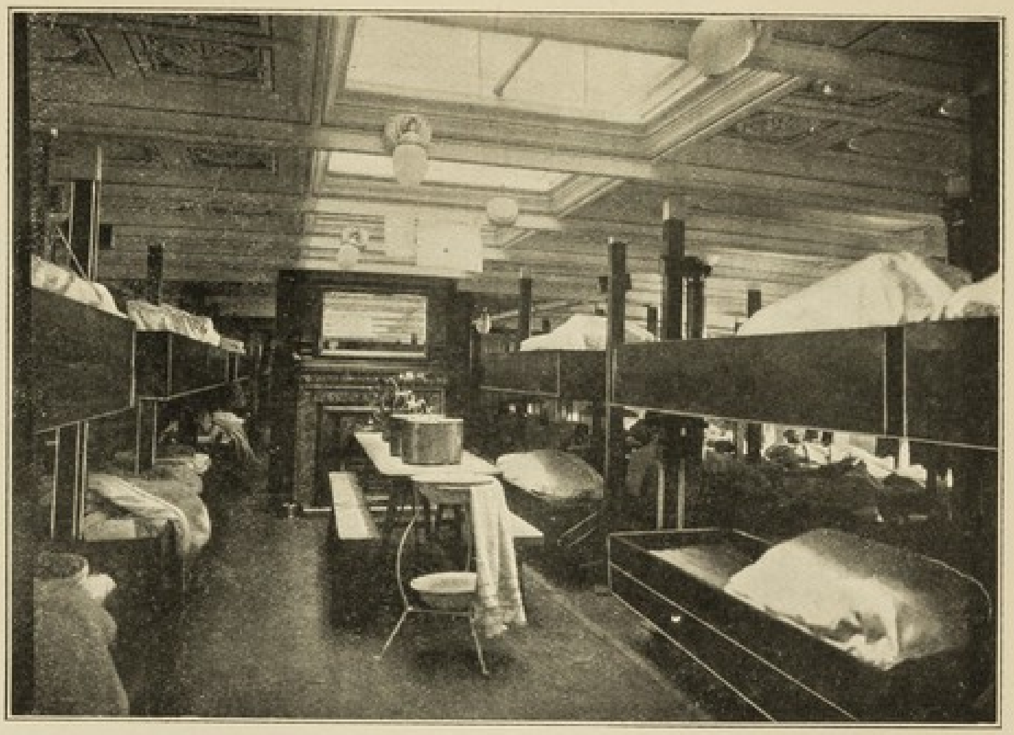
On the starboard side are dressing rooms, with a good X-ray room and the usual Siemens-Halske machine, with therapeutic attachments. The baths and closets are either of the Japanese type or of a modified type, and did not seem to me to be specially worthy of the ship. There is an isolation cell for the insane. It is well padded, with canvas cover, and painted white. In the door is a small sliding shutter to hand in food, and in one corner is a closet, so arranged that the basin for receiving the discharges can be removed from the outside without disturbing the patient.

At the situation of the cargo ports forward there is left on each side a space for receiving patients, so that a small gangway can be used to take them aboard, or a flatboat coming alongside can easily and expeditiously deliver patients at this point. Of course, in a seaway which prevented the opening of these ports this method could not be used. A spare space here can be fitted up with 25 or 30 additional bunks, if needed, and is known as a spare ward; it could be used for convalescents or for special isolation cases.

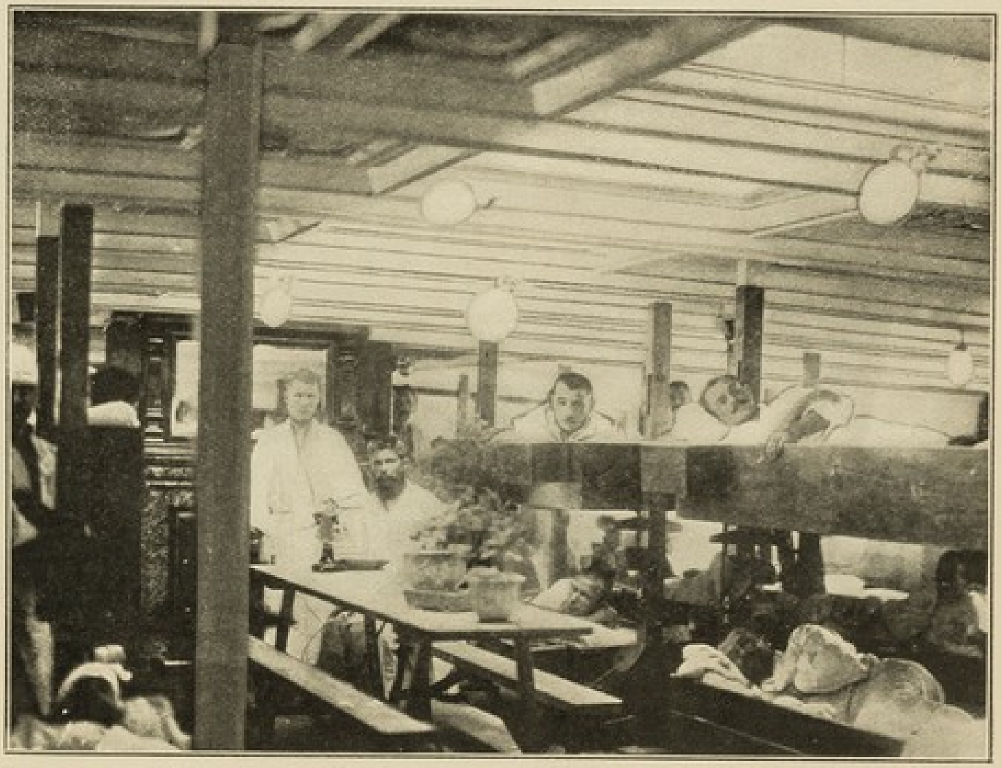
NAVAL HOSPITAL SHIF SAIKYO-MARU. LABORATORY.



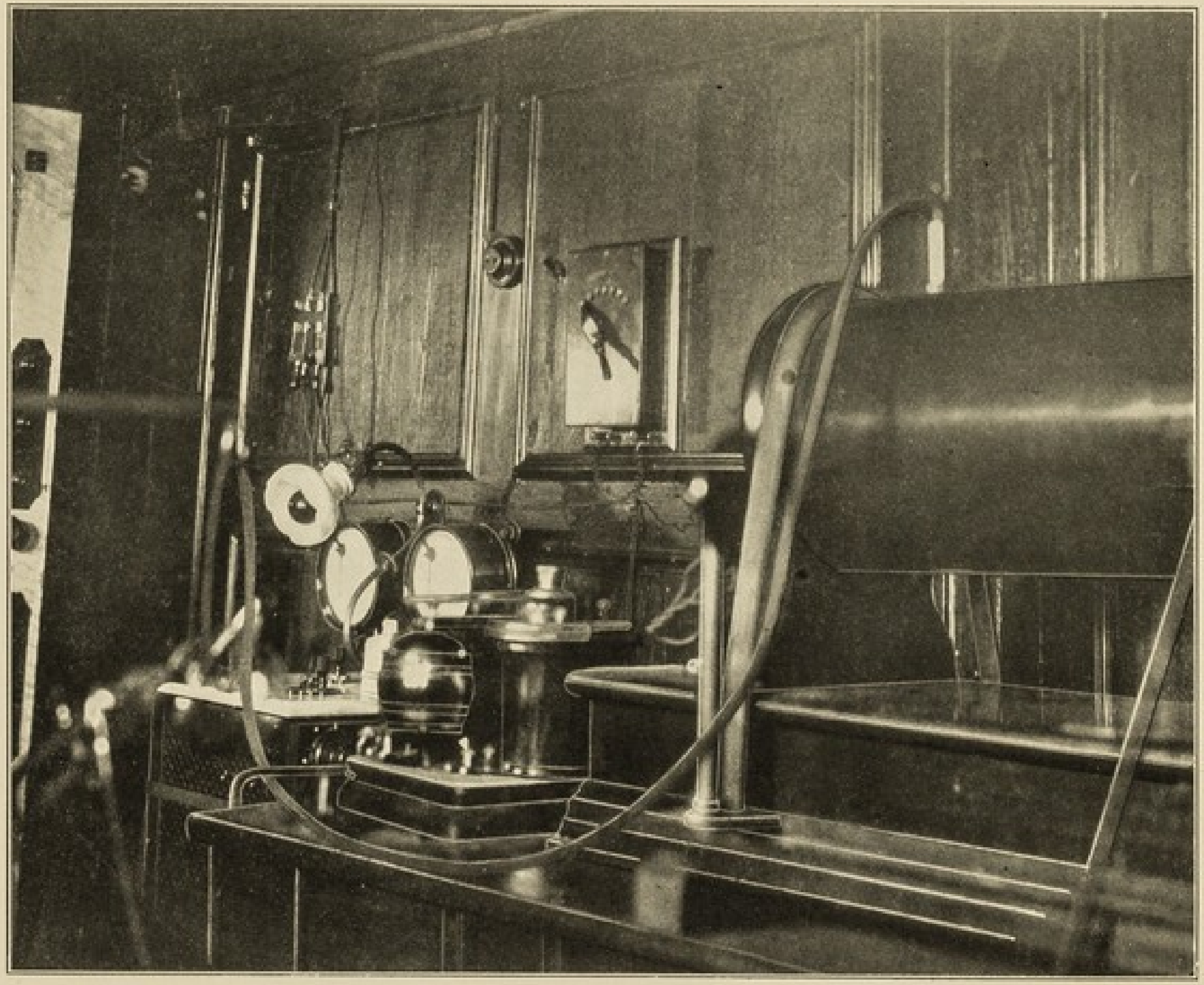
NAVAL HOSPITAL SHIP KOBE-MARU. DRESSING STERILIZER.



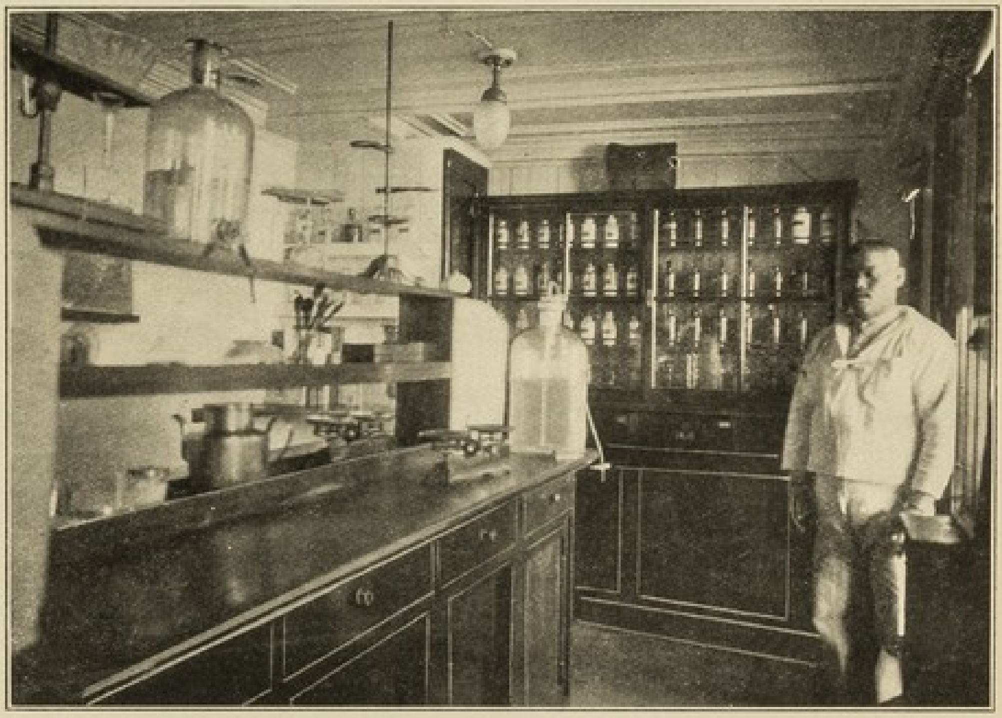
NAVAL HOSPITAL SHIP SAIKYO-MARU. SURGICAL WARD.



NAVAL HOSPITAL SHIP SAIKYO-MARU. MEDICAL WARD.



X-RAY ROOM, JAPANESE NAVAL HOSPITAL SHIP SAIKYO-MARU, SERIES NO. 13.



NAVAL HOSPITAL SHIP SAIKYO-MARU. DISPENSARY.

JAPANESE NAVAL HOSPITAL SHIP. REPAIR AND SHARPENING OF INSTRUMENTS.

SAIKYO-MARU, SERIES NO. 2. PHOTOGRAPHIC ROOM.

The galleys are divided for the use of officers, patients, and the crew. They seemed to be in fairly good condition, with ranges and hot water, soup, and tea boilers.

Outside the wards are folding shelves, which can be used as serving tables for the patients' food.

On the lower deck is the ice machine, a carbon dioxide machine of 1,100 pounds per diem capacity; also cold-storage and refrigerating rooms. They are not used at present, ice being obtained from shore as needed. There is also a large compartment just forward of the engine room bulkhead for the nurses. They may either swing in hammocks or lie in bunks, a certain number of double-banked bunks being provided for them.

There is also on this deck a large storeroom, with supplies of dressings, medicines, and drugs, some for use on the hospital ship and some for issue to ships of the fleet in case of need. There are also storerooms for the supply of clean clothing for patients.

On the main deck certain rooms have been retained for the use of officers. They are simply ordinary staterooms, as used in the merchant service. They usually are occupied by one officer only, but could be used by two, if needed. One room is set aside for a high ranking officer, as an admiral, but does not differ materially from the others.

Male nurses only are employed on these ships.

Small wards for infectious diseases are fitted up on the lower deck forward, the crew swinging in the vicinity. It would seem better, as already mentioned, to put the infectious cases on the hurricane deck aft, where they would be entirely separate, especially as these ships are able to stand the additional weight.

On the whole these ships are efficient. They did not impress me as favorably as I had hoped. They seemed less spacious than expected, and the finish of surfaces, sanitary arrangements, etc., were not as well looked after as it would seem possible. Still the *Saikai Maru* was coaling and undergoing repairs at the time of my visit, and this must be taken into account. Our own hospital ship, *Relief*, at present awaiting commission at Mare Island, is, to my mind, far superior in fittings and accommodation to any of the hospital ships I have seen. The only thing in which these ships surpass the *Relief* is in being better sea boats. I do not think there is anything of special importance that we could adopt from these ships.

## ORGANIZATION.

On the medical side the detail is as follows:

Fleet Surgeon Ota, rank of captain, in command of the ship.
Fleet Surgeon Aaoki, rank of commander, senior surgeon.
Staff Surgeon Endo, rank of lieutenant commander.
Assistant Surgeon Imayoshi, rank of lieutenant.
Assistant Surgeon Sanno, rank of junior lieutenant.
Two pharmacists, rank of lieutenant.[3]
One naval paymaster, rank of lieutenant.

The nurses are males, and vary in number according to the needs of the service; at present 45.

The surgeon in command receives all orders from the admiralty and transmits them to the captain of the ship. This command is absolute, the captain[a] of the ship taking his directions from the senior medical officer.

The captain is not a naval officer, but belongs to the merchant marine. He has entire control of the seaman branch on duty, regulating all matters pertaining to them and to discipline.

The discipline of the medical branch is in the hands of the surgeon in command.

The seaman branch is composed of 1 captain, 1 chief mate, second mate, third mate, chief engineer, first assistant engineer, second assistant engineer, third assistant engineer, all merchant marine; 1 paymaster, and 1 clerk, not belonging to the navy.

The crew consists of 72 men. Of these 30 are firemen, and the remainder of quartermasters, boatswains, deck hands, cooks, etc.

It is to be noted that there are two paymasters. The naval paymaster attends to all matters pertaining to the medical force and sick; he acts also as commissariat. The civilian paymaster attends to all matters in his department pertaining to the crew.

For the sick and medical force there are 2 chief cooks and 4 assistant cooks. For the captain and crew there are 4 cooks employed.

Mess men are not provided for the sick, the work being performed by the nurses.

The routine for the day is as follows: 6 a. m., rise; 6.15 a. m., hammocks and bunks made up; 6.30 a. m., cleaning of all wards, washing patients, and getting ready for surgeon's inspection; 6.45 a. m., prepare for breakfast; 7 a. m., breakfast; 8 a. m., patients visited by surgeon, general inspection; 8.30 a. m., surgical dressings made, patients in medical ward examined afterwards; 11.45 a. m., prepare for dinner; 12 m., dinner; 12.30 p. m., wards cleaned for the afternoon; 4 p. m., prepare for supper; 4.15 p. m., supper; sunset, hammocks slung; 8.45 p. m., prepare for general inspection; 9 p. m., inspection.

The first Wednesday in each month nurses are inspected as to their clothes, skin, hair, shoes, underclothes, bedding, and hammocks. Third Tuesday of each month, nurses' bag inspection.

Each Tuesday and Friday the nurses wash their clothes; do not use laundry. Each Saturday there is a general cleaning of the whole ship.

---

[a] Note on hospital ships by the Director-General, Saneyoshi: "There is a small canteen on both *Kobe* and *Saikio Maru*. We used officers of the line in addition to the civilian captains and crew on hospital ships, but we removed the combatants for three reasons: (1) Because there might be some dispute as to the Hague agreement; (2) because naval officers and men might be short and needed; (3) we could not use a cipher code on the hospital ships, but use the universal signaling code, so that there is no special necessity for naval men."

The general food for patients is divided into four classes, as follows:

| | Daily amount. | Morning. | Noon. | Evening. |
|---|---|---|---|---|
| No. 1. | | | | |
| Fresh bread | 65 | .......... | 65 | .......... |
| (Dried bread) | (50) | .......... | (50) | .......... |
| Beef with bone | 60 | .......... | 60 | .......... |
| Fresh fish with bone | 40 | .......... | .......... | 40 |
| Fresh vegetables | 100 | 20 | 40 | 40 |
| Rice, cleaned | 100 | 50 | .......... | 50 |
| Cracked wheat | 35 | 17.5 | .......... | 17.5 |
| Sugar | 6 | .......... | 6 | .......... |
| Tea | .5 | .......... | .5 | .......... |
| Parched wheat | 1 | .5 | .......... | .5 |
| No. 2. | | | | |
| Fresh bread | 50 | .......... | 50 | .......... |
| (Dried bread) | (40) | .......... | (40) | .......... |
| Beef with bone | 60 | .......... | 60 | .......... |
| Fresh fish with bone | 40 | .......... | .......... | 40 |
| Fresh vegetables | 90 | 20 | 35 | 35 |
| Rice, cleaned | 80 | 40 | .......... | 40 |
| Cracked wheat | 28 | 14 | .......... | 14 |
| Sugar | 6 | .......... | 6 | .......... |
| Tinned milk | 12 | 6 | 6 | .......... |
| Eggs | 28 | 28 | .......... | .......... |
| Tea | .5 | .......... | .5 | .......... |
| Parched wheat | 1 | .5 | .......... | .5 |
| No. 3. | | | | |
| Fresh bread | 60 | 30 | .......... | 30 |
| (Dried bread) | (40) | 20 | .......... | 20 |
| Meat for soup | 100 | 50 | .......... | 50 |
| Fresh vegetables, potatoes, etc | 60 | .......... | 30 | 30 |
| Rice for gruel | 20 | .......... | 20 | .......... |
| Fresh milk | 100 | .......... | 50 | 50 |
| (Tinned milk) | (20) | .......... | (10) | (10) |
| Sugar | 6 | 3 | .......... | 3 |
| Eggs | 84 | 28 | 28 | 28 |
| No. 4. | | | | |
| Meat for soup | 150 | 50 | 50 | 50 |
| Rice for gruel | 60 | 20 | 20 | 20 |
| Fresh milk | 150 | 50 | 50 | 50 |
| (Tinned milk) | (30) | (10) | (10) | (10) |
| Eggs | 42 | 14 | 14 | 14 |

NOTE.—Tinned milk shall be given by dissolving 10 "momme" of it in 1 "go" of water (2.623 "go" equal 1 pint). Patients are given 0.25 "momme" of black tea and 5 "momme" of condensed milk at 3 p. m. each day.

In the above table is used the Japanese "momme" as the unit of weight. 1.036 "momme" equivalent to 1 drachm.

Besides this, on the hospital ships specially nutritious food is allowed the patients as follows: Condensed milk, beef extract, eggs, butter, cornstarch, oatmeal, macaroni, prepared wheat, canned mushrooms, strawberry jam, tea, port wine, and somatose.

From May to December, 1904, the following numbers and kinds of cases were transferred:

| | |
|---|---|
| Wounded in battle | 584 |
| Of the above number— | |
| Navy | 225 |
| Army and Russian wounded | 359 |
| Injured but not wounded in battle | 108 |
| Medical cases— | |
| From the navy | 561 |
| From other sources | 103 |
| Infectious, mostly dysentery (navy) | 147 |
| Venereal | 94 |

Hospital ships do not carry a dentist, because the surgeons of the Japanese navy are instructed in the Navy Medical School in some branches of dentistry and are able to make temporary fillings. Each squadron, however, has one dentist employed to do the work of the fleet.

The *Kobe Maru*, the other naval hospital ship, is so much like the *Saikio Maru* that it is not thought necessary to give a description of her. The blueprint is, however, submitted with a list of the various rooms, wards, and plants in accordance with the letters on the plan indicating the same.

The Japanese have many hospital ships in the army, some eighteen, I believe. Some of these were visited, but special mention is made of one of the Red Cross hospital ships, of which there are two. These ships were built as hospital ships and should be of special interest. They are known as the *Hakuai Maru* and the *Kosai Maru*. A special effort was made to see the *Hakuai Maru*, but I was somewhat disappointed to find that; although built as a hospital ship, she had been so constructed as to be readily converted into a merchant steamer. This naturally prevented carrying out plans that would look to the construction of a ship for hospital purposes only. This ship is just about the same size as the *Saikio Maru* of the navy. Her tonnage is 2,636. She has a capacity of 200 patients—300 might be taken in an emergency. There is but one main ward, with a capacity of 114 patients. There are other special small wards for serious cases, with a capacity of 4 patients in each. Aft on the main deck are rooms for officers. They are, however, simply ordinary staterooms with double bunks and a transom, so that they could accommodate 3 officers. The saloon, which is large and spacious, is not used, but could be used by putting patients on the floor in Japanese beds.

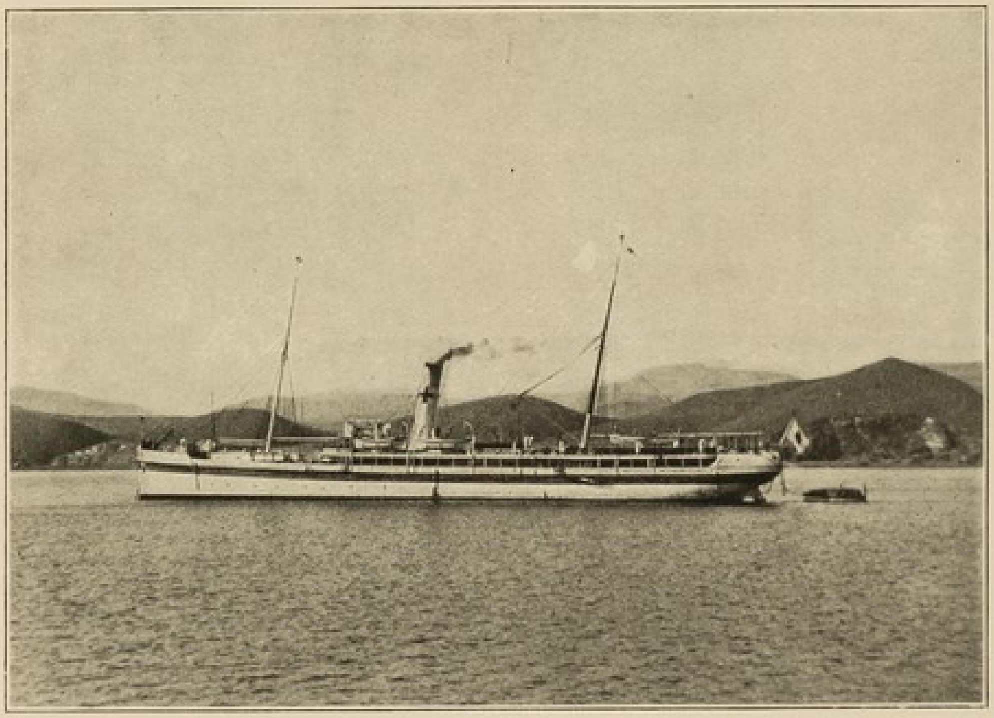
I was surprised in going about the ship to see the things not used—thus, there is a laundry on the lower deck forward that is not used, as the runs are short and washing can be done ashore. There is a circular wringer, a mangle, and a washer. There is an ice machine and a refrigerating room, but not in use as they can carry ice and provisions for the few days of passage. There is a dead room on the after lower deck, but it is not used, as they can more conveniently carry the dead in other places. There is a distilling apparatus, but it is not used, as they can get good water ashore.

In other words, we must remember that these ships have nothing like our own hospital ships had to do during the Spanish-American war, and I seriously doubt if the work could be done in so satisfactory a manner if the distances were not so short. Thus these hospital ships are largely in the nature of specially fitted transports.

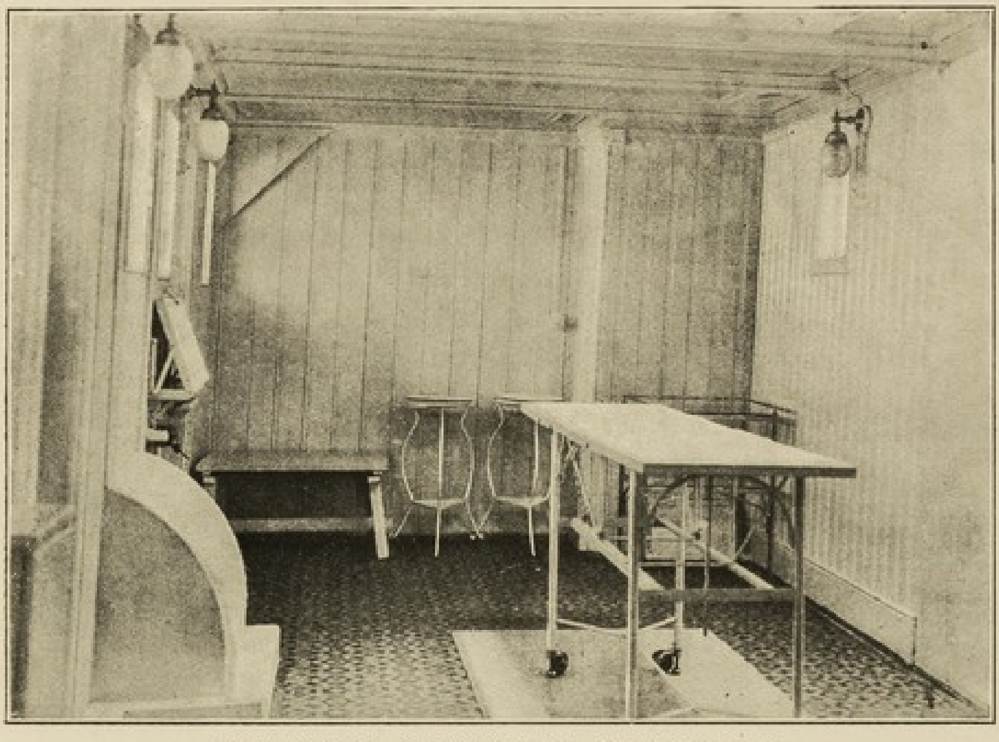
On going into the harbor of Ujina one morning after the battle of Mukden, I saw seven hospital ships at anchor. It seemed strange at this naval base to see no evidence of battle ship or cruiser, but only the presence of such a fleet of hospital ships.

A contagious disease ward, accommodating 35 patients, is situated forward on the main deck, shut off from the rest of the ship by a water-tight compartment.

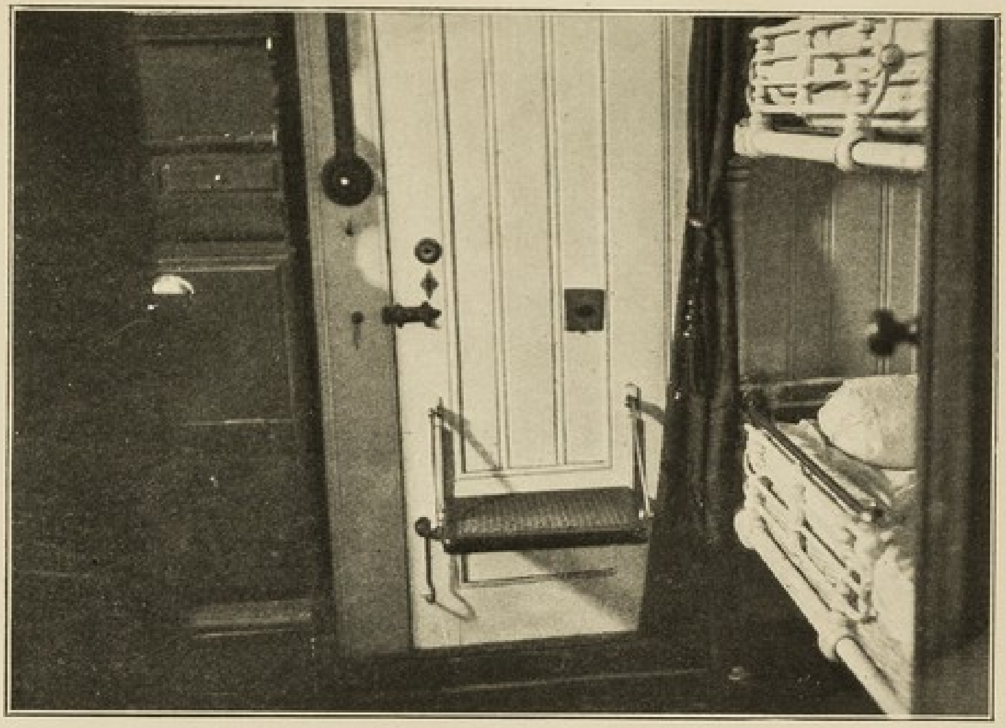
There is a good operating room, a surgeons' preparing room, and an X-ray room of about the size and situation on the main deck that is found on the *Relief*.



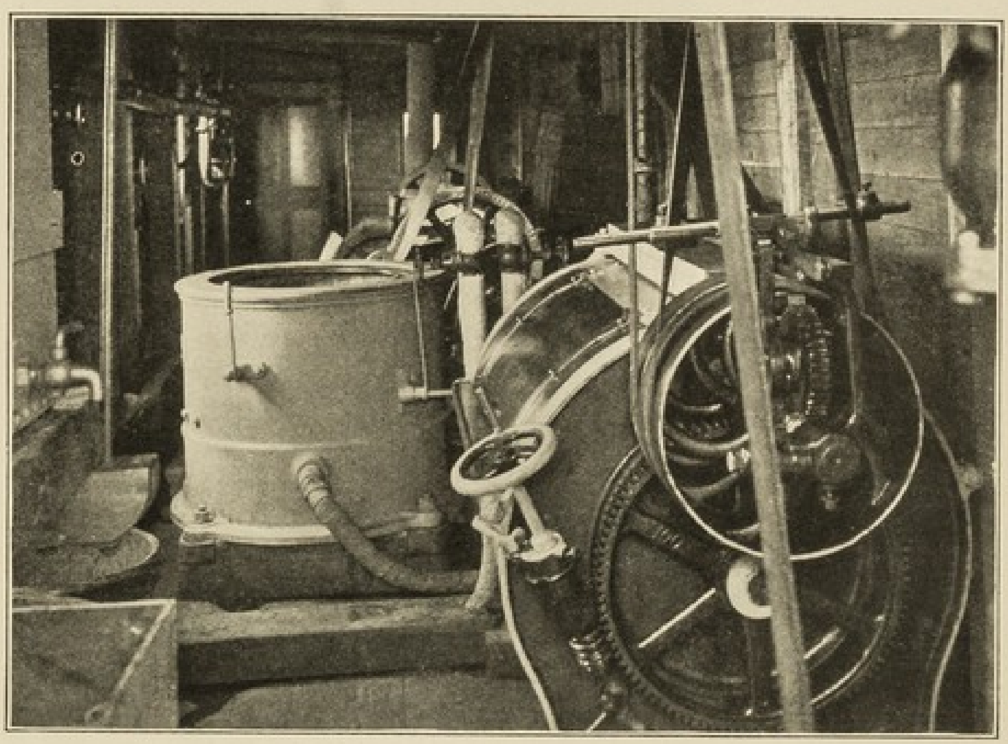
JAPANESE NAVAL HOSPITAL SHIP. KOBE-MARU.



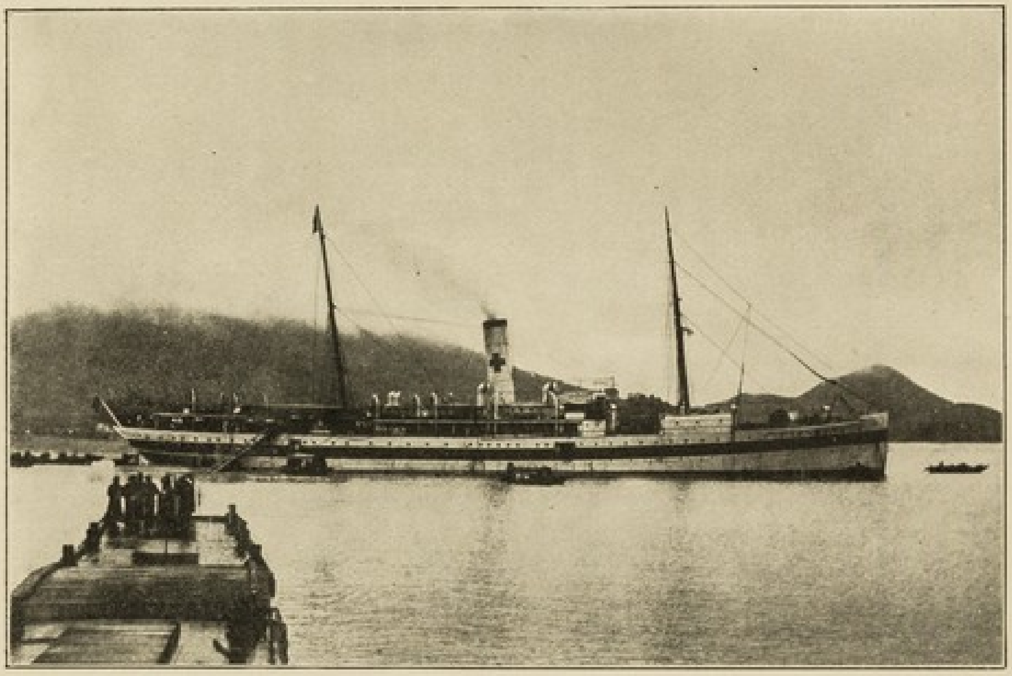
NAVAL HOSPITAL SHIP KOBE-MARU. OPERATING ROOM.



KOBE-MARU, SERIES NO. 22. ROOM FOR SICK OFFICER.

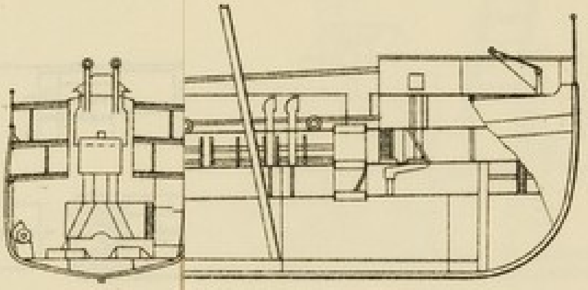


KOBE-MARU, SERIES NO. 25. LAUNDRY.



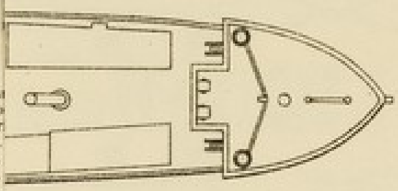
RED CROSS HOSPITAL SHIP "HAKUAI-MARU."

## MARU

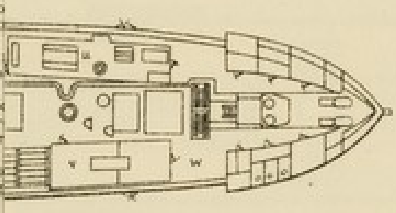


H

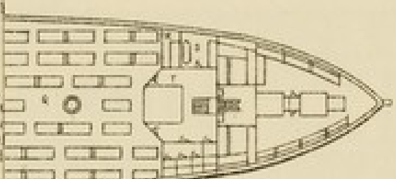
A. Hatch through
B. Skylight, operat
C. Steam laundry.
D. Small boats. 7
E. Water tank.



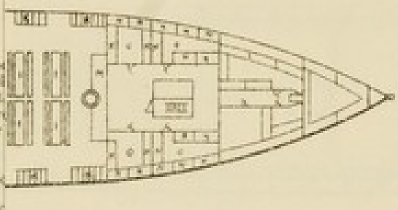
A. Dead-room.
B. Disinfecting cha
C. Washing place o
D. Room for prepar
E. Operating room.
F. Surgeon's room.
G. Surgeon's room.
H. Surgeon's room.
I. Bacteriological l
J. Dark-room.
K. Room for sharpe
L. Pharmacist's roo
M. Pharmacist's roo
N. Surgeon's room.
O. Chief Surgeon's
P. Officers' mess-ro
Q. Dispensary.
R. Paymaster's offi
S. Store-room for v
T. Drying room for
U. Laundry.
V. Steam disinfecto
W Shute for garbag



A. Spare sick ward.
B. X-Ray room.
C. Double-banked
D. Surgical ward.
E. Stove.
F. Dining table.
G. Serving table.
H. Surgeon's office.
I. Bath-room for s
J. Insane cells (pa
K. Sick Warrant O
L. Head Nurse and
M. Reception room
N. Ladder for nur
O. Double-banked
P. Mess-room. Pa
Q. Medical ward.
R. Pantry for sick.
S. Bath for sick.
T. Gangway.

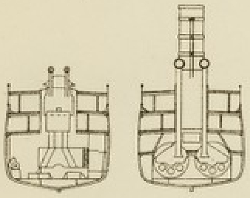


A. Medical store-ro
B. Store-room for c
C. Dressings. Lint
D. Racks and shelv
E. Store of food for
F. Ice-tank room.
G. Ice storage.
H. Refrigerating ro
I. Ice machine.
J. Berthing space f
K. Clothing and sto
L. Mess table for n
M. Hammocks store
N. Beds for crew an
O. Contagious disea



THE NORRIS PETERS CO., WASHI

# IMPERIAL JAPANESE NAVAL HOSPITAL SHIP KOBE MARU



### HURRICANE DECK.

- A. Hatch through which seriously wounded cases are lowered.
- B. Skylight, operating room.
- C. Steam laundry.
- D. Small boats. 7 meter.
- E. Water tank.

### UPPER DECK.

- A. Dead-room.
- B. Disinfecting chamber for dressing materials.
- C. Washing place of dirty material.
- D. Room for preparing patients for operation.
- E. Operating room.
- F. Surgeon's room.
- G. Surgeon's room.
- H. Surgeon's room.
- I. Bacteriological laboratory.
- J. Dark-room.
- K. Room for sharpening instruments.
- L. Pharmacist's room.
- M. Pharmacist's room.
- N. Surgeon's room. (Assistant's state-room.)
- O. Chief Surgeon's room.
- P. Officers' mess-room.
- Q. Dispensary.
- R. Paymaster's office.
- S. Store-room for vegetables.
- T. Drying room for clothes.
- U. Laundry.
- V. Steam disinfector.
- W. Shute for garbage and waste material.

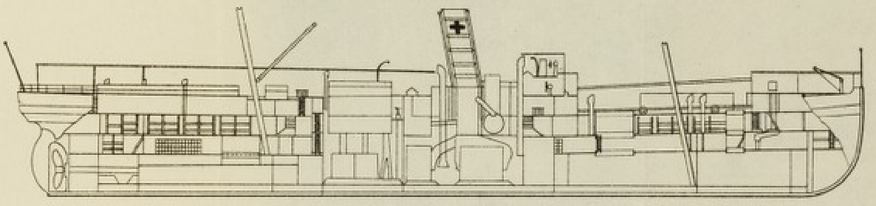
### MIDDLE DECK

- A. Spare sick ward. 28 beds.
- B. X-Ray room.
- C. Double-banked beds.
- D. Surgical ward. 78 beds.
- E. Store.
- F. Dining table.
- G. Serving table.
- H. Surgeon's office. (Records.)
- I. Bath-room for surgical patients.
- J. Insane cells (padded).
- K. Sick Warrant Officers' rooms.
- L. Head Nurse and Petty Officers' room.
- M. Reception room for sick.
- N. Ladder for nurses.
- O. Double-banked bed-room.
- P. Mess-room. Patient's.
- Q. Medical ward. 72 beds.
- R. Pantry for sick. Canteen.
- S. Bath for sick.
- T. Gangway.

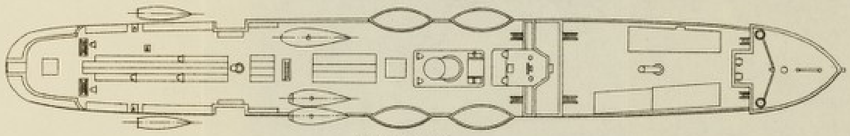
### LOWER DECK.

- A. Medical store-room. (Shelves.)
- B. Store-room for clothing supplied to patients.
- C. Dressings. Lint, bandages, and dressing material.
- D. Racks and shelves for medicine bottles.
- E. Store of food for sick. Canned goods, eggs, etc.
- F. Ice-tank room.
- G. Ice storage.
- H. Refrigerating room.
- I. Ice machine.
- J. Berthing space for nurses.
- K. Clothing and stores for 250 men. Bag room for sick patients.
- L. Mess table for nurses.
- M. Hammocks stowed.
- N. Beds for crew and firemen.
- O. Contagious disease ward.

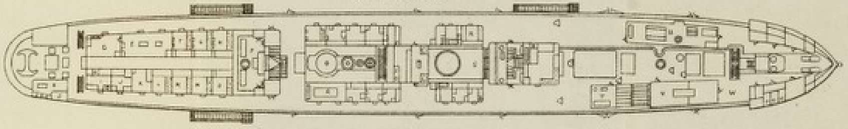
INBOARD PROFILE



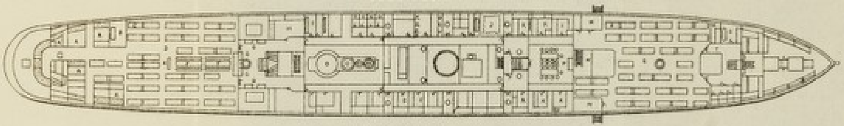
HURRICANE DECK.



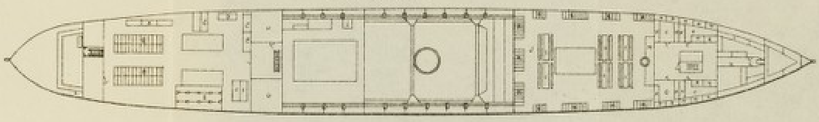
UPPER DECK.



MIDDLE DECK.

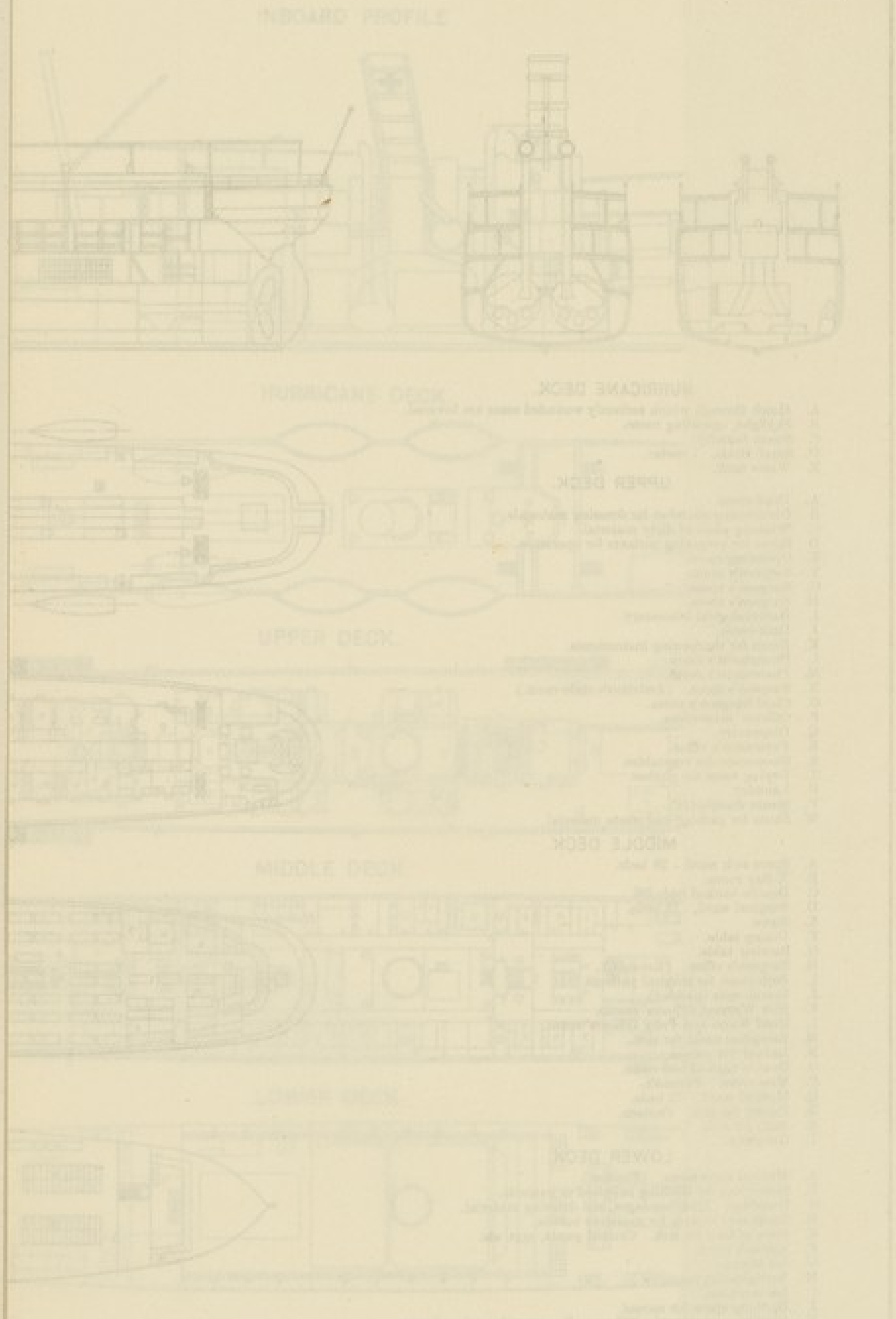


LOWER DECK.



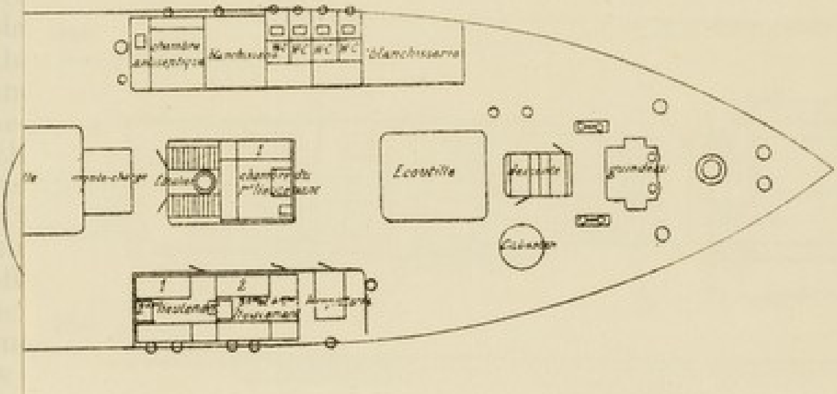
THE NORRIS PETERS CO., WASHINGTON, D. C.

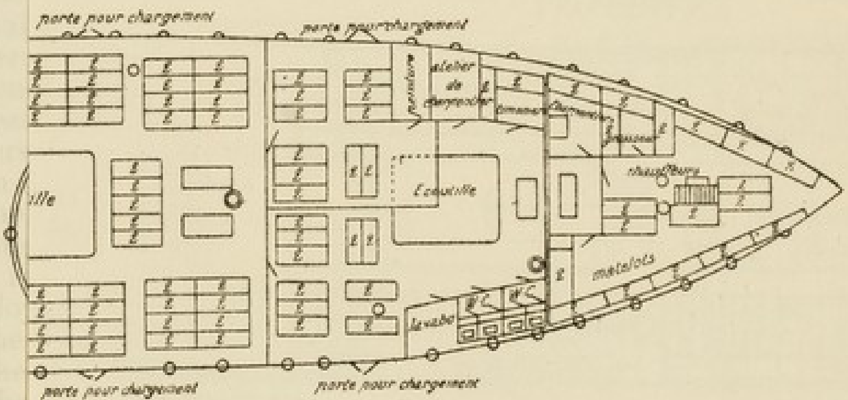
## IMPE JAPANESE NAVAL HOSPITAL SHIP KOBE

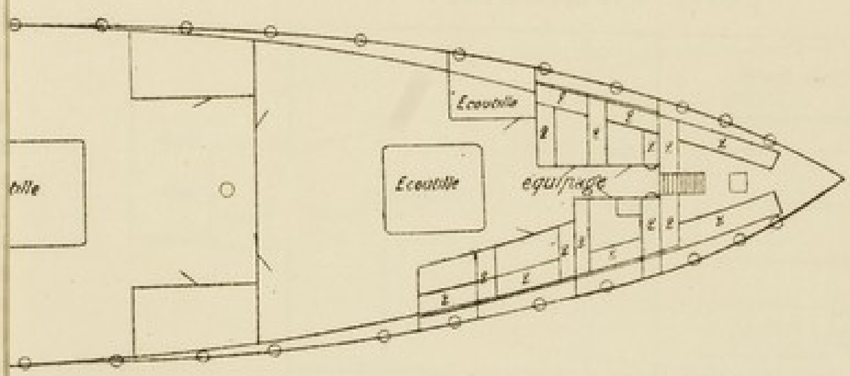


P

# Croix-Rouge du Japon.



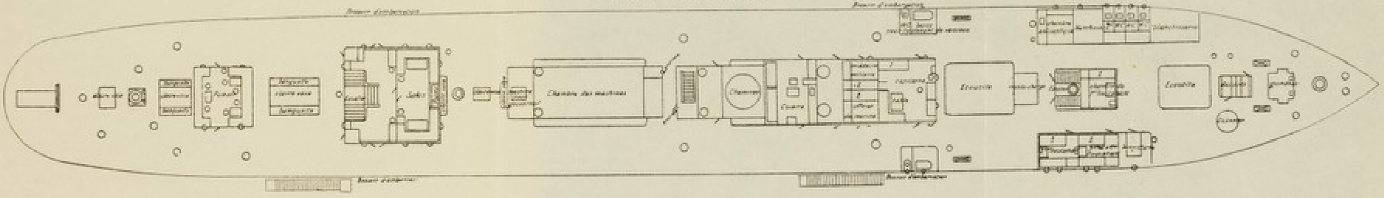




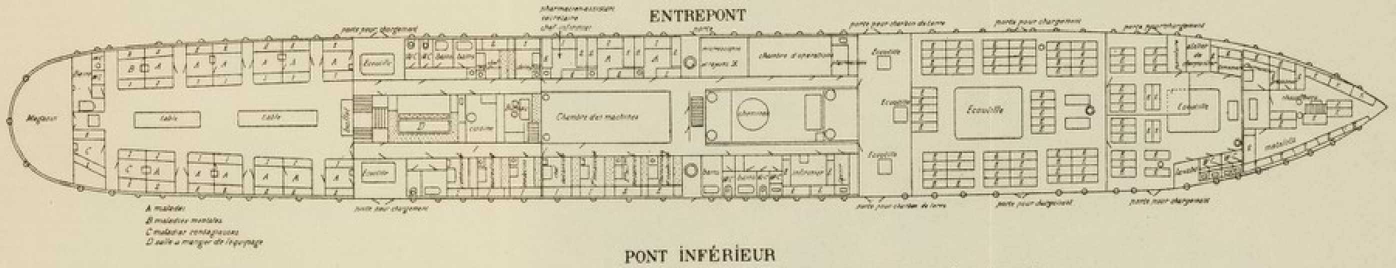
# Plan du "HAKUAÏ-MARU," RED CROSS HOSPITAL SHIP

## Bateaux-hôpitaux d'évacuation pour malades et blessés de la Société de la Croix-Rouge du Japon.

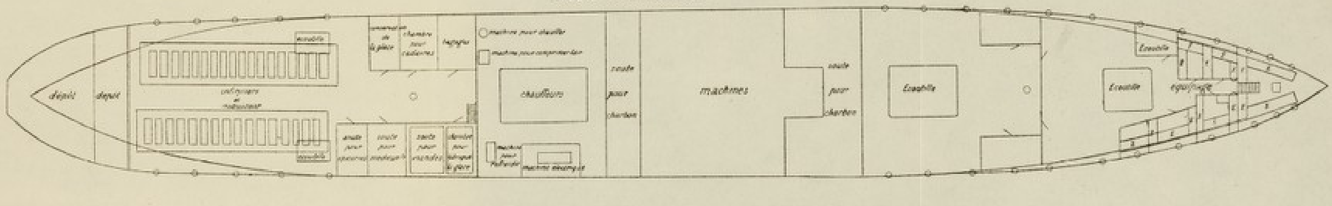
### PONT SUPÉRIEUR



### ENTREPONT



### PONT INFÉRIEUR

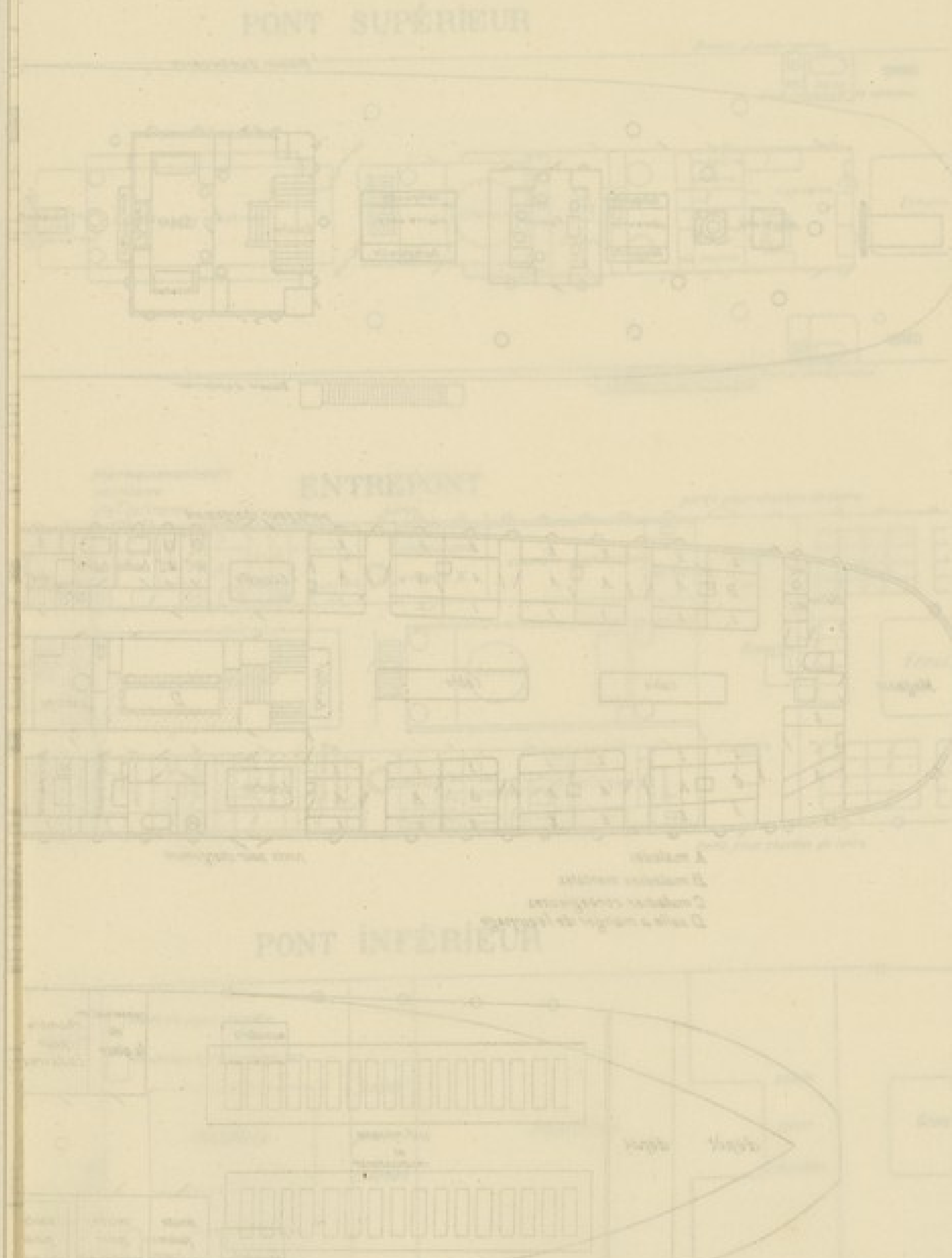


**NOTA.** — Les chiffres indiquent le nombre de lits de chaque cabine : les pointillés indiquent des fauteuils pouvant, en cas de nécessité, faire office de lits.

THE NORRIS PETERS CO., WASHINGTON, D. C.

# “KUJI MARU,” RED CROSS HOSPITAL SH

[illegible] et blessés de la Société de la



The one ward of 114 bunks is large and neat, with bunks double-banked, but made of gas piping instead of the usual wooden bunk. They are quite crowded, and in some places it must be very difficult to get the patients into the bunks. The nurses are most all female Red Cross nurses, graduates of the Tokyo Red Cross Hospital. There are 33 female nurses, with 3 head nurses. One head nurse has charge of the operating room, one of the ward, and one of the officers. The head nurses have rooms by themselves, and the ordinary nurses are in a compartment by themselves, fitted up with the same gas-pipe double-banked bunk as seen in the wards. There are 10 male nurses, but they are kept for light cases and for the heavy work of transporting and orderly work.

The storeroom on the lower deck contained many fine dressings, and there was an abundance of supplies both for use on the ship and for distribution.

On the upper deck there is a fine and well-appointed mess room, a smoking and lounging room for officers, and very good quarters for the officers, both medical and ship's.

The bathrooms and closets did not do the ship credit, being of the Japanese or modified Japanese type. There were some closets and baths of English make, notably the captain's.

The crew consists of 83, the total personnel of the ship, including medical officers and nurses, being 137.

The Red Cross surgeon, F. Mitomi, is in command of the ship. Captain Sekine receives his instructions through the senior medical officer. I asked the captain particularly about this, and he said the system worked well. He attends to the discipline of the crew, and the senior medical officer to the discipline of his own department. Orders from the department come to the surgeon, and he transmits them to the captain.

The purser makes out the diet lists or bills of fare on approval by the medical officer in command. The purser buys all the provisions and is responsible for quality and quantity. There are 7 cooks employed altogether, 3 extra cooks being for the patients.

The methods of transportation are (1) by stretcher or ladder, (2) by the use of large flat-bottomed boats brought to the cargo ports, (3) by the use of a small davit at the cargo port, and (4) by the use of a large crane near the bow of the ship.

The disinfector is on the starboard side, forward, of the upper deck.

From observations of the various hospital ships it is easy to see that the ideal hospital ship has not yet been built. While the Japanese have many hospital ships and a splendid organization for the care of the sick and wounded and for their ready transfer to good hospitals, still the experience so far gained in the war demonstrates only the great use of this type of ship, but has not demonstrated the perfection of detail that those interested in hospital ships have been looking for. It will not be until some Government is willing to spend a sufficient sum to build a ship of this kind, with the single idea of its character and use, that the perfect ship will be found.

It is no more possible to pick up any merchant steamer, no matter how fine she may be in her own sphere, and convert her into a prefect ship of the hospital type than it is to convert such a ship into a perfect man-of-war. A hospital ship should be built from carefully thought-out plans in a civil shipyard, where no previously conceived ideas may tend to interfere with the perfect carrying out of her construction. As a rule, these ships are too small. We need plenty of unencumbered space, with light and air. Such a ship should be of at least 5,000 tons, with not too high a free board, with good beam and false keels to keep her steady and give her spacious decks. She should have a speed of at least 15 knots per hour and good coal capacity. She should have at least four good clear decks—the upper deck for air and recreation for convalescents, with the after part of the deck for the purpose of infectious diseases. Forward on this deck should be the captain's quarters, with his chief officers and their mess and offices, in order that they may not interfere with the work of the ship below and take up space needed for the sick.

The deck below should have, forward, suitable double rooms with baths for officers of high rank, and single rooms for officers below command rank. They should have a mess room with suitable lounging and amusement room; aft of this should be the operating room and skylight, with surgeon's preparing room and X-ray room, with all electrical appliances. There should be a good photographic and dark room, the dark room being of use for examination of the eye and for artificial illumination for nose, throat, and ear work.

The after part of this deck should be the surgical ward, with its attendant dressing room and a pus-operating room. In the extreme rear should be the laboratories, with plenty of light; a bacteriological and a chemical labratory, with a small library of reference books. Also a dentist office, which requires special light, with square ports and small skylight.

On the deck below, but still above the water line, should be a good medical ward forward, with attendant examining room, and aft a good-sized convalescent ward, with a generous mess room between the two wards. Each ward should have a special room for its head nurse, in order that he may always be able to keep in touch with his patients. The after part of this deck should have rooms for the hospital stewards. In the center, on the starboard side, should be the dispensary, with adjoining room for the pharmacist; on the port side a large general office for medical records, etc., under the charge of a competent steward; forward of this the room for the pay clerk and a paymaster's office. The paymaster should also be the commissariat and have a carefully selected canteen.

On the deck below, the berth deck; forward, the crew; next the laundry, dynamo, disinfecting chamber, ice plant, and refrigerating rooms, and several cells, with padded walls, for the insane. Aft there should be accommodation for senior and junior nurses—a large, commodious room that could be used for study and lecture room in the daytime. There should be baths and closets for their use in the extreme stern.

On the lower deck, the hold, should be the storerooms for medical stores, paymaster's and engineer's storerooms.

Under the refrigerating plant, but at a respectable distance from it, is the mortuary chamber, with apparatus for keeping a low temperature.

Each department should have its bath, wash room, and closets in its rear and properly isolated to prevent odors from annoying patients and others. The senior surgeon should have his rooms in connection with the sick officers. The senior assistant, aft, near the surgical ward, and the junior medical officers, 2 or 3, forward, on the deck below the middeck, just forward of the medical ward.

All surfaces should be especially plain and smooth, no fretwork, no elaborate shutters or other fancy work to collect dirt and render cleaning difficult.

The galleys should be on the berth deck, near the center of the ship, discharging the odors of cooking into large uptakes and with good natural and artificial ventilation. There should be an elevator—a light-running Otis passenger elevator—from the hold to the upper deck of sufficient size to admit of a patient, stretcher, and carriers. There should be large cargo ports for the admission of patients brought alongside, with small companion ways leading to them; also hatches cut in the upper or hurricane deck for the swinging of small davits for the transfer of patients when needed.

Such, roughly, should be the construction of a hospital ship.

The organization should be divided into the medical and navigating departments, the senior medical officer being in command of the distinctly hospital parts of the ship. If the ship is under the direction of a naval officer of the line he should have a general command, but not extending to the working details of the hospital organization If a civilian captain and crew are employed, then the senior surgeon should be in command so far as the transmission of official business is concerned, and official orders should be transmitted through him.

The Japanese have tried both methods of command and seem to think that a civilian captain with a senior medical officer in command is the better method.

The command is distinctly a noncombatant one, and so often distasteful to line officers who are desirous of following more distinctly professional routine.

The records of a hospital ship should be kept as on any ordinary ship—the same forms and journals, with the addition of a weekly report to the Chief of the Bureau of Medicine and Surgery.

Particular attention should be paid to the food and the employment of competent cooks of sufficient number especially looked out for. For the messes there should be mess attendants, the nurses looking out for the food of bed patients.

## HOSPITALS.

The Japanese have four distinct naval hospitals—one at each of the great naval stations of Sasebo, Kure, Yokosuka, and Maizuru. These hospitals were planned about twenty years ago by the present Baron Takaki, then medical director-general of the Imperial Japanese navy.

They have been added to from time to time and are, in general, in excellent and efficient condition. They are all built on the pavilion plan, and in the main are arranged in much the same manner, so that each is to a certain extent a duplicate of the other. Plans and photographs have been obtained and will be submitted in order, the plans in the text of the report and the photographs in groups by themselves.

In order that there may be no undue repetition, a careful description of one will be given, with its organization, and a few explanatory remarks made on the others. The hospital selected for special description is the one at Sasebo naval station.

The hospital is situated in the naval compound on a somewhat elevated bluff overlooking the harbor and the naval station. Entering the hospital grounds, guarded by the usual porter's gate, we are directly in front of the administration building, marked "1" on the plan and shown in the series of photographs, with illustration of transportation of patients on stretchers, Sasebo series, No. 34. This building is a large, two-story frame building containing the administrative offices of the chief surgeon and staff, with mess room and officer of the day's room; also the chemical laboratory and urine-analysis room, marked "8" on the plan. This laboratory is quite extensive and is in charge of an expert pharmacist, who is also an excellent chemist. Careful quantitative and qualitative analyses of water, food, wines, etc., are made here for hospital, medical storehouse, and for ships desiring especial work of this kind.

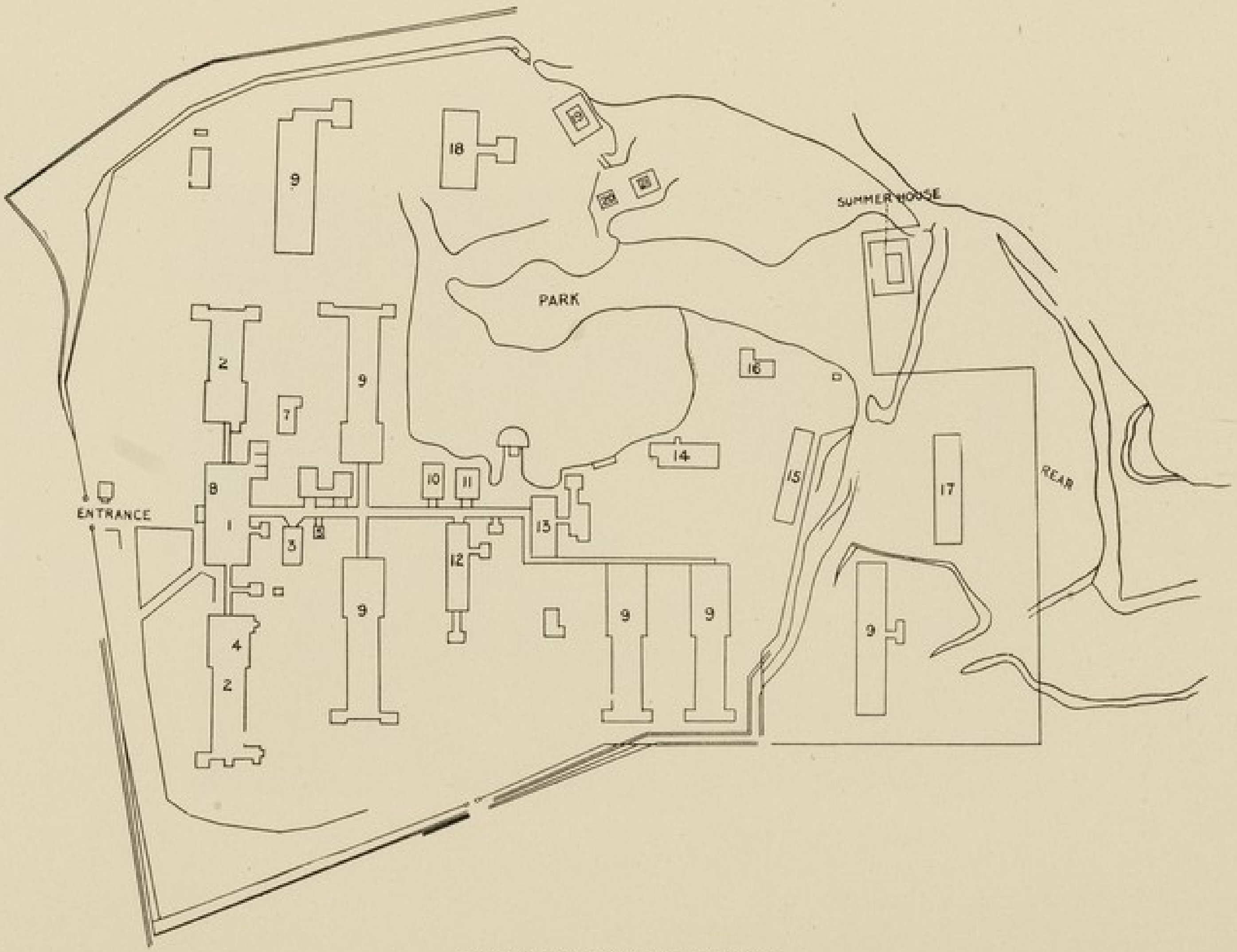
From either end of this building one proceeds through a covered corridor to pavilions marked "2," the one on the left being a single-story pavilion for medical ceses and the one on the right being a two-story pavilion, with rooms for sick officers. A surgical ward below is shown in photograph of Sasebo series, marked No. "32," with Surgeon Kuwabara, assistant director of hospital, in foreground. From the photograph one can get a very good idea of the wards in general. They are spacious, with neat iron beds, usually painted green, with unpainted but very clean floors, the refinements of absolutely smooth surfaces and rounded corners wanting, but still an air of purity and cleanliness throughout.

At the head of the bed is usually some arrangement for patients to keep a few personal articles, either a small shelf or sometimes a little cupboard. In this particular case a small shelf was used. In the center of the ward is seen a huge chimney with open fireplaces on either side, and usually there are adornments in the way of flowering shrubs or articles made by the patients. At the rear of the ward is a door leading into a corridor with baths at one side and closets at the other. The baths are the usual Japanese baths made of wood and either square or round. Neither kind is large enough to allow one to lie down in, but they are excellent hot baths when once you get into them. The round tub has a small compartment at the side, lined with metal for burning charcoal, and this is the source of heat for the water. The closets are the usual Japanese closets, very clean, but to our minds very primitive and disagreeable, and I believe the Japanese think so, too. Gradually the European closet, with proper seat and adnexa, are coming into use in some places.

The beds in the ward are furnished each with 1 straw mattress, 2 white sheets, 2 blankets, and 1 Japanese pillow.

The officers' rooms are of about 650 cubic feet space. They are very clean, but very plainly furnished, usually without any rug or carpet, a single iron bed, center table, and bureau—sometimes not so much. Usually heated by an open-grate fire. They are efficient, but I fear would hardly suit the fastidious taste of our officers. The upper story of this pavilion—the surgical pavilion—has been taken for the use of officers, and screens are used to make rooms. Around the open fireplace are easy chairs, a place to smoke, read, and play games, and adorned by beautiful artificial flowers presented by some princess. At the rear of this ward is a door and corridor with baths and closets, as in the ward below.

SASEBO NAVAL HOSPITAL, NO. 32. SURGICAL WARD.



PLAN OF SASEBO NAVAL HOSPITAL.

SASEBO NAVAL HOSPITAL, SERIES NO 31. OPERATING ROOM.

On the first floor of this pavilion, marked "4," is a spacious X-ray room, with a large Siemens-Halske X-ray machine with a 60-centimeter spark, with rheostat, all therapeutic attachments, and many powerful lamps, giving a beautiful, steady, and powerful light of good defining power. Telephone connections are also established in this room.

At the entrance to the surgical ward are neat serving rooms for food, nurse room, surgeon's room, and a good dressing and medicine room, all kept scrupulously clean. These wards are under the charge of female nurses, of whom we shall speak later.

Passing through the corridor at the rear of the building we come to a small detached building used to contain patients' effects. Thus, when patients are received at the hospital their clothes are all taken from them, sterilized, and, with such other effects as they may have, are stored in this storehouse. The hospital supplies each patient with a clean suit of underclothes and a padded kimono, with socks and slippers, so that no dirt or contagion of any kind can be carried into the hospital wards. This is a most excellent idea. Passing along the corridor we come to detached building No. 5, which is a photographic and dark room, used for developing pictures and also as a dark room for eye, ear, and throat work. This room and work is under the charge of Surgeon Kabuto, an expert photographer, who keeps series of all radiographs and photographs. The outfit is very complete.

Building No. 6, the next in order on the plan, comprises the operating room, the surgeons' wash room, and the room for preparing patients for operation. Photograph No. 31 of the Sasebo Hospital series shows the operating room, which is complete in every detail, as can readily be seen by a glance at the picture. The floor is of concrete, the walls smooth, natural finish; an abundance of natural light from the sides and skylight at the top, and many hanging and portable electric lights. There are sterilizers for hot and cold water in the adjoining preparing room and dressing sterilizers. Steam is furnished for these purposes from the engine room. There is a small but neat surgeons' wash room with basins, but without knee and foot pedals. The patients' preparing room for operations is spacious and complete, the instruments adequate, of late design, and in excellent condition. On the whole, the operating room and its adnexa are efficient, the absence of rounded corners and nonabsorbing wall surfaces perhaps a defect.

Building No. 7, as will be seen from the plan, is completely detached. It contains the pathological and bacteriological laboratories. They are well equipped and show the evidences of constant and conscientious work. It is to be noted that each of these naval institutions possesses in detached buildings well-equipped laboratories of this kind. They are under the general supervision of some one of the staff specially skilled in this work, with usually tables for the individual work of each surgeon. Much experimental work is always going on, as well as the routine work of the hospital. The drudgery of the laboratory, such as making media, cleaning, running incubators, etc., is usually in the hands of a trained assistant from the nurses' corps. The Japanese excell in this branch and in surgery and bend all their energies in this direction. Medicine proper does not seem to attract them so much. Series of pathological specimens of much interest are always to be found and, as a rule, all the pathogenic bacteriological cultures and many others of special interest to the workers in the laboratory. There is always an animal house containing large numbers of rabbits, guinea pigs, marmots, pigeons, rats, mice, etc., for the experimental work, and when we consider that these are not distinctly laboratories but simply adjuncts to naval hospitals the extent and completeness of these outfits is rather surprising and shows the amount of interest and work these gentlemen are carrying on with the ordinary routine hospital work.

Buildings marked "9" and "9" are one-story pavilions—so-called temporary pavilions—of the usual type built for the war. They have at the entrance nurses' rooms, serving rooms for food, dressing and medicine room, and at the rear bathrooms and closets of the Japanese style, as already described. The beds in the naval hospitals are usually good, substantial iron beds, with foot and head rods for stretching mosquito netting when needed. Where iron beds are not used, the usual bed made of unpainted pine, with box frame and wooden legs, is used. These wooden beds are seen more often in the army hospitals. As a rule, it has seemed to me that the naval hospitals are better equipped than most other institutions. Each of the pavilions can accommodate about forty patients, and with a good, large air space. The ventilation is, of course, natural; the sides are usually largely composed of windows, and the ends being usually open give plenty of free circulating air. The patients always look fairly well and seem happy and contented.

Building No. 10 is a storehouse for medical stores for ships, and building No. 11 a storehouse for surgical stores for ships. Each hospital has these two buildings. Instead of having one general storehouse as we have for the issue of supplies to ships and stations, here each naval hospital has these supplies, and can issue them direct to ships or bases needing them, the requisitions for these supplies being granted at once by the surgeon in command of the hospital without referring to the bureau of medicine and surgery, the only exception being in cases of exceptionally expensive things. The medical storehouses are always well stocked, and contain the usual run of drugs and medicines. They are kept in most excellent condition under the charge of the pharmacist. The surgical storehouses contain ample supplies of dressings, splints, hospital furniture, first-aid dressings, gauzes, bandages, cottons, splinting of various kinds, stretchers, surgical instruments, many being of the very latest style, in aseptic metal cases, although some old stock with the plush finishing of cases is seen. This old stock is gradually disappearing, and is being replaced by the more recent designs. Boat boxes, emergency boxes for transports, special large surgical and medical cases for landing parties and for use on men-of-war are to be found in each storehouse. While this scheme increases the number of supply stations and makes the system more complex than the issuing from a single storehouse, still it seems a wise provision, especially in time of war, to have supplies accessible at once at each naval base, and therefore the system is commended. Here was demonstrated to me the use of the "Totsuka stretcher," a description of which will appear under the consideration of methods of transportation.

Building No. 12, as seen by the plan, is a pavilion building for the use of nurses. The nurses have bags and hammocks stowed in hammock cases. They sleep in hammocks swung in this pavilion; they have their mess tables here; they have their own closets and baths, and when off duty this building is for their use. The idea is most excellent, as it keeps the nurses from the patients and allows them when off duty the liberty and freedom of action which can not be allowed when they are berthed in the immediate vicinity of patients.

Building No. 13 contains the kitchens, comprising three rooms, containing cooking ranges, boilers, soup kettles and tea kettles, and the various arrangements of Japanese cooking. There are provisions made for the cooking for officers, for the enlisted force, and for the nurses, and cooking can be done both in the foreign and Japanese styles. While I think the general finish of the kitchens could be improved, still the food is well cooked and everything seems neat. The inspection of the food showed it to be of excellent quality and sufficient in quantity.

The food is divided into four classes:

1. Full ration consists of curry, meat, bread, vegetables, fish, and tea. (For convalescents.)

2. The same as No. 1, except that the quantity is reduced. (For convalescents.)

3. Consists of bread, eggs, boiled rice, and milk. (For the moderately sick.)

4. Fluid diet, consisting of milk, rice soup, beef soup, and canned vegetables. (For the very sick, on the doctor's order only.)

All milk is carefully sterilized, usually in specially constructed sterilizers.

By weight, the food of the different classes is as follows:

| | Bread. | Meat with bones. | Fish or fowl with bone. | Rice. | Barley. | Fresh vegetables. | Condensed milk. | Eggs. | Meat for soup. | Fresh milk. | Tea. | Barley for barley water. | Sugar. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 1 | 65 | 60 | 40 | 100 | 35 | 120 | ...... | ...... | ...... | ...... | 0.5 | 1 | 6 |
| No. 2 | 40 | 60 | 40 | 80 | 20 | 80 | 24 | ...... | ...... | ...... | .5 | 1 | 6 |
| No. 3 | 60 | ...... | ...... | 40 | ...... | ...... | 24 | 28 | 150 | ...... | 1 | .5 | 6 |
| No. 4 | ...... | ...... | ...... | 42 | ...... | ...... | ...... | 42 | 99 | 150 | .5 | .5 | ...... |

The unit of weight in the above is the "momme," one of which is equal to 3.75 grams.

Besides the above, certain delicacies for the sick may be allowed, if needed, on recommendation of the doctor in charge. It is thus seen that the diet is quite a generous one, rich in nitrogenous products and carbohydrates, and not so different from our own.

To prepare this food, there is 1 head cook, with 20 assistants, some acting as assistant cooks and some as carriers of food, and acting in various capacities about the kitchen. There are also employed 3 stewards, who supervise the work of the cooks and distribution of the food. Special conveyance boxes are provided to carry the food and keep it warm. These provisions, of course, vary in the different hospitals somewhat. Rice is usually cooked and placed in individual metal boxes for transportation to the patient, and so kept fresh and warm. There are also similar conveyance vessels, closed, for carrying soup.

Building No. 14 is the washhouse and laundry, provided with a Nelson & Kreuter washer; also a No. 2 circular wringer, and a good-sized drying room with racks. The ironing of washed material is done by hand. I was told that all the washing for the hospital was done by the laundry, and that not even convalescents washed any of their own clothes.

Building No. 15 is an old building formerly a ward, but now used for the storage of old material. It could,however, be used as a ward.

Building No. 16 is the disinfection building. This building contains one large disinfector, made at the naval machine shops, Sasebo, about 6 feet long by 5 by 4. Disinfection is accomplished under 15 pounds pressure for thirty-five minutes at a temperature of 110° C. The disinfector has a special device for rapidly exhausting and drying the contents. The building is divided into two parts, one part for the reception of contaminated articles, with the door of autoclave opening through the dividing wall, and the other part made for the reception of the disinfected articles when the process is complete. There is, of course, nothing special about this apparatus except that Japanese disinfectors are made larger than ours usually are, and also are generally of Japanese manufacture.

No. 17 is a large new temporary building, intended for contagious diseases in case there should be an epidemic or need for more room than in building No. 18. This building has an asphalt floor, is built of Japanese pine, unpainted, well constructed, and battened. It has three isolation rooms for serious cases; the beds are of iron, painted green, with canvas stretched across in place of springs. There is one small ward with 6 beds, and a main ward with room for 24 patients. At one end of the building are the usual Japanese closets on one side of the hall, and bathrooms on the other side. In the center of the building is a room with Japanese wooden bunks for nurses; also a serving room, the food being brought from the main kitchen. The building is electric lighted and heated by coal stoves.

Building No. 18 is the old ward for contagious diseases.

Building No. 19 is the dynamo room and engine house, furnishing electric lights and steam for the operating room, washhouse, laboratories, etc.

No. 20 is the plant for burning garbage. Each hospital is furnished with a good garbage burner, and usually with a small outhouse to hold garbage for biweekly burnings.

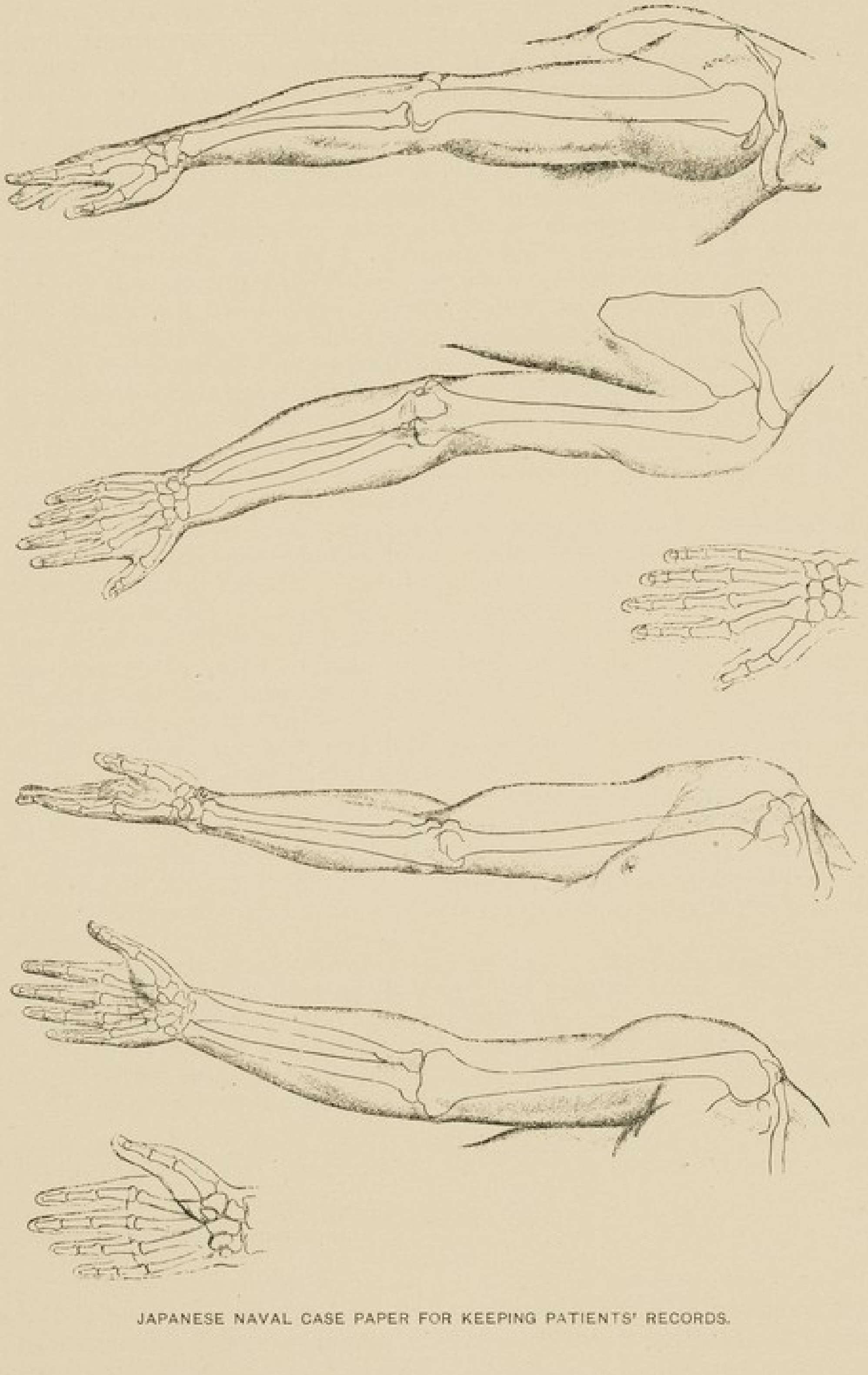
No. 20 is a small deadhouse and necropsy room furnished with the usual outfit, running water, etc., to be found in such constructions.

The capacity of the hospital is as follows:

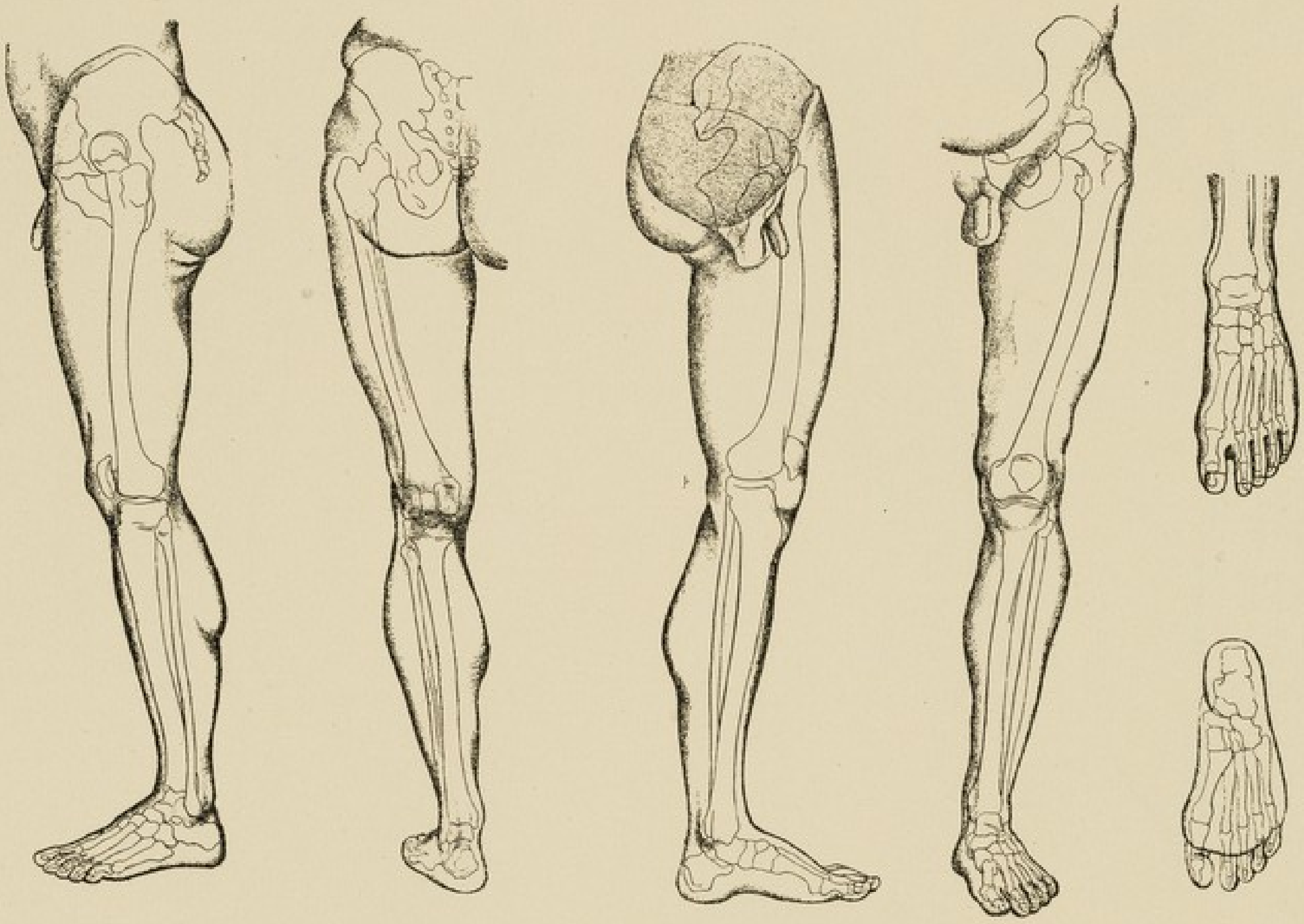
| | Patients. |
|---|---|
| Permanent buildings | 212 |
| Temporary buildings | 222 |
| Total | 434 |
| Outside additional barracks that may be used | 180 |
| Total | 614 |

The medical staff consists of 1 surgeon-general, 1 assistant to surgeon-general, 2 fleet surgeons, 1 staff surgeon, 2 surgeons, 2 senior assistant surgeons, 6 probationary surgeons, 4 Red Cross surgeons.

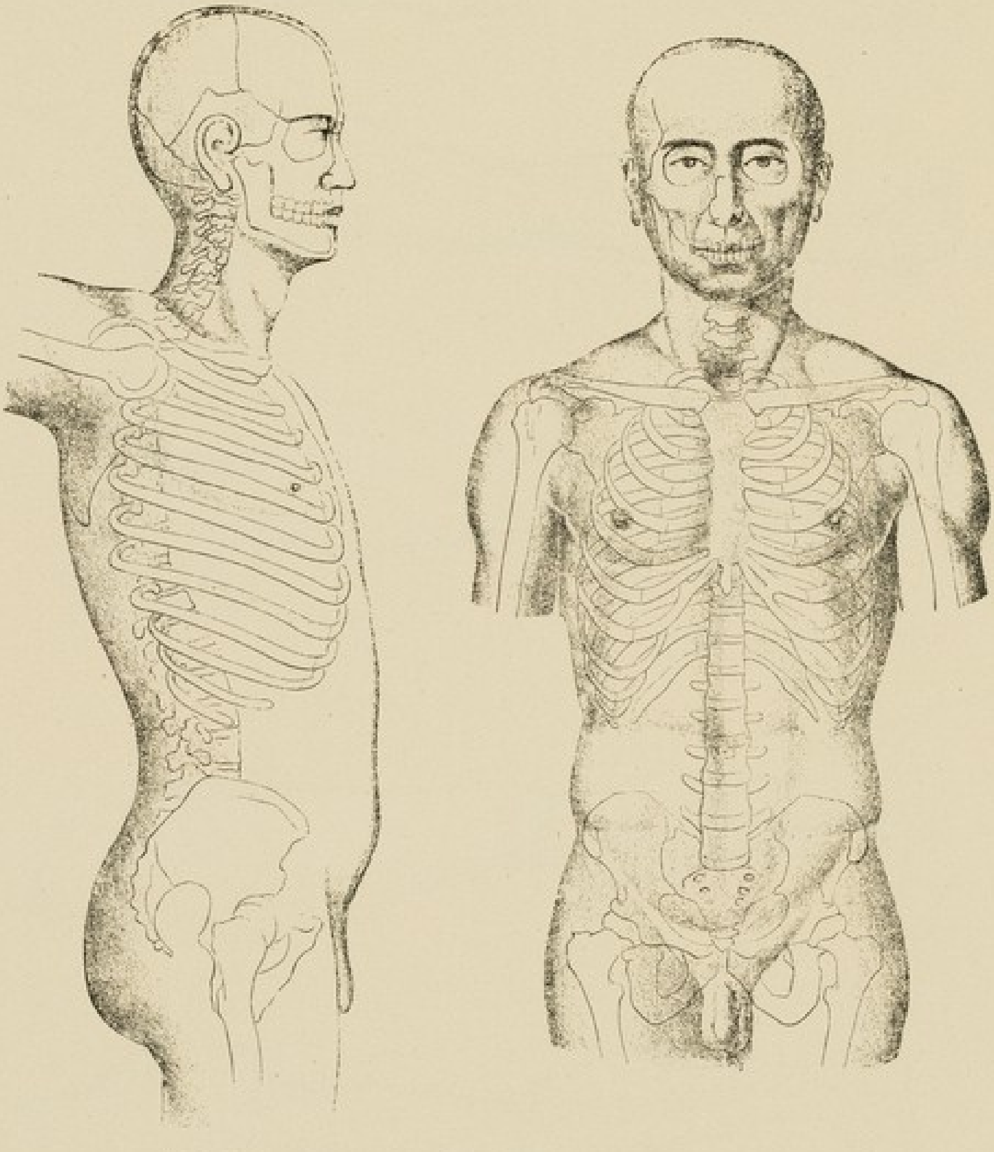
These surgeons are on duty every day from 8 a. m. until 5 or 6 p. m.



JAPANESE NAVAL CASE PAPER FOR KEEPING PATIENTS' RECORDS.



JAPANESE NAVAL CASE PAPER FOR KEEPING PATIENTS' HISTORIES.



JAPANESE NAVAL CASE PAPER FOR KEEPING PATIENTS' RECORDS.

SASEBO NAVAL HOSPITAL, SERIES NO. 33. HOSPITAL PARK FOR CONVALESCENTS.

There are no quarters as a rule at any of the hospitals for the members of the staff, all living outside in the city, but at night there is always 1 surgeon and 1 probationary surgeon in charge of the hospital, who have rooms in the administration building.

There is 1 pharmacist with the rank of lieutenant-commander, a commissioned officer, who is also an expert chemist and who has charge of the chemical laboratory assisted by 2 junior pharmacists.

The force of nurses is 36 regular nurses (male), 55 temporarily hired nurses (male), 4 head nurses (female, Red Cross), and 40 ordinary nurses (female, Red Cross).

The female nurses usually have charge of the surgical wards and special cases. They live outside the hospital grounds, going to and from their homes as they are relieved or go on duty. The surgeon-general in command informs me that they are always detailed in couples, and that he favors their employment in naval hospitals in war time, but does not think they are needed at other times. He states that he is highly satisfied with their work and that they have given no trouble in any way. These female nurses are all from the Red Cross Society, some from Nagasaki and some from Hakata. The subject of female nurses will be referred to again under the head of the Red Cross Society.

In the plan will be noticed a tongue of land marked "Park." This is a large high bluff, commanding a fine view of the bay and surrounding country and beautifully laid out as a park for the convalescent patients. A winding stone stairway leads from the rear of the hospital to the top of this bluff. There is a summerhouse and seats amid cedar trees, with flowers. Here convalescents, and particularly pulmonary cases, can sit and breathe the purest of air in the bright sunshine. This provision is not peculiar to this hospital alone, but it is a marked feature of each Japanese naval hospital and one of the most attractive and beautiful ones. It will be noted that in each naval compound the hospitals have been given the choicest sites and those best fitted for the care of the sick.

The hospital records are most carefully kept, with temperature charts of all important cases, and all injuries, operations, and location of pathological conditions are noted on diagrammatic figures, a sample of which is attached. As the Japanese usually draw well, some of the representations are extremely striking and true to life.

This finishes the description of the Sasebo Hospital; and a few general remarks will be made concerning the other hospitals, calling attention to any special points of interest they may have.

## KURE NAVAL HOSPITAL.

This is one of the largest of the naval hospitals. It is situated on a high bluff, overlooking the harbor and naval station, with mountains rising rather abruptly in the rear and on the sides. The hospital is on the same general plan as Sasebo Hospital, with a large central administration building at the entrance. It is on the pavilion system with three pavilions, one wooden and two built of brick, in the rear of the administration building. The pavilions are all two stories instead of one. Two new pavilions are being built, which will be of the same general plan as those already mentioned. A new operating room of brick is being built and will be very complete. It will be a small separate building between pavilions 2 and 3, and is connected by covered passageway with the various pavilions. It will have a central passageway at entrance leading to the operating room proper; on the right of the passage will be a large surgeons' preparing room, and on the left a good-sized sterilizing room for dressings and a smaller instrument room. The operating room is of good size, will have cement floor, with plenty of light on three sides and from skylight in the top. The walls will be of hard finish, permitting them to be washed and kept aseptic. The foundation is only built at present, and so it is impossible to give further general details. The present operating room is in one of the pavilions and is well equipped and fitted with many modern appliances. They have the Kneefoot pedal for surgeons' washstand. The capacity of the hospital is about 350, and 150 more patients can be accommodated in a temporary barrack built at one side of the grounds.

There is a special pavilion well fitted up, and with some padded cells, for the treatment of the insane, and a large and very-well equipped pavilion for infectious diseases. The usual detached pathological and bacteriological laboratory and a large library, comprising some 5,000 volumes, has been donated by the Patriotic Association of Ladies for the use of the patients.

There is one large amusement room for the patients, with games of various sorts, where the patients can amuse themselves in bad weather. In fine weather the grounds in the rear of the buildings have been made especially attractive for convalescents, and between pavilions 1 and 2 Surgeon Inspector Ishiwara has taken great pains to fit up the grounds in a most attractive way to present a pleasing prospect for the patients occupying beds in these pavilions. A very good idea of this can be obtained from the photograph of the Kure series, marked No. "42."

There is an abundant supply of pure mountain water having its source in the mountains at the rear of the hospital, and most attractive grounds at the rear, of high elevation, for the patients. One special provision was noted in the grounds in the rear of the pavilions, and that was the placing of sputa cups at convenient places for the use of the patients.

The X-ray apparatus is the usual Siemens and Halske machine with 60-centimeter spark, in good working order and with good dark rooms and photographic outfit.

A telephone system connects the nurses' rooms with the administration building.

A fine separate building has been fitted up for the male nurses in the rear of the grounds. The kitchens are in a detached building connected with the wards by a covered passageway, and are neat and quite complete. It is to be noted that the Japanese always have a large force to carry on the work of the kitchen and the distribution of food.

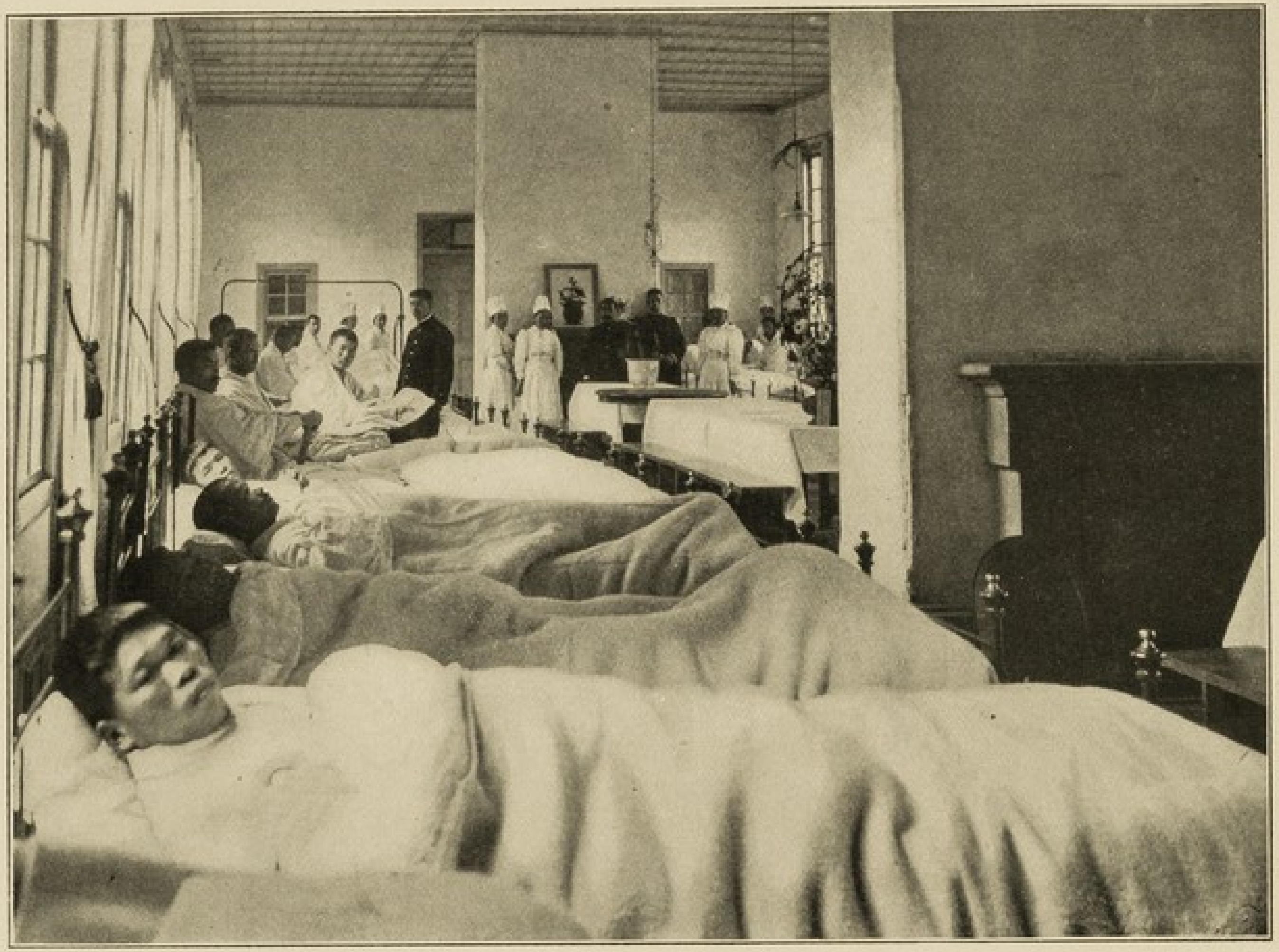
There is a very complete electrical dynamo building to furnish lights and power for the X-ray machine.

The building for the disinfection of clothing, etc., is furnished with a specially large autoclave, 10 feet long by 5 feet in diameter. This is mentioned specially because the autoclaves of our hospitals are usually small in comparison.

KURÉ NAVAL HOSPITAL, SERIES NO 42.

Shows grounds between pavilions 2 and 3.

PLAN OF MAIDZURU NAVAL HOSPITAL.



KURÉ NAVAL HOSPITAL. SURGICAL WARD.

A large garbage plant at the rear of the grounds is in constant use, burning all garbage, sputa, urine, typhoid stools, etc. This apparatus is in use several times a week, and costs but 45 cents to operate at any one time.

Twenty-two female nurses from the Red Cross Society are employed in the surgical wards and on special cases, the usual number of male nurses being retained besides. The female nurses employed in this hospital are from the Red Cross Hospital, Tokyo. I was informed by the surgeon in command that they were much liked and well educated.

The series of photographs of Kure Hospital will give a good idea of the wards and grounds and some interesting cases will be noted, particularly of shell wounds.

All the special buildings, such as laundry, deadhouse, medical storehouses, etc., mentioned at Sasebo are to be found here. In fact, each hospital is almost a duplicate of the other.

No plans of this hospital were obtained.

### MAIZURU NAVAL HOSPITAL.

This is the smallest of the naval hospitals, also the most recently established. It is situated on an elevated plateau, overlooking the beautiful and picturesque bay, which is surmounted by high mountains. The harbor is not large, but almost absolutely shut in and with plenty of deep water.

From the plan one sees that we have the same pavilion system and almost identically the same buildings as we had at Sasebo and Kure, thus:

1. Administration building.
2. Water-closet.
3. Servant's room.
4. Hot-water room for drinking purposes.
5. Operating room.
6. Kitchens.
7. Storehouse for fuel.
8. Disinfecting chamber.
9. Laundry.
10. Water-closet.
11. Water-closet.
12. Nurses' quarters.
13. Washhouse for nurses.
14. Engine house.
15. Washing place for urinals, etc.
16. Garbage burner.
17. Storehouse for articles to be burned.
18. Insane pavilion.
19. Infectious pavilion.
20. Water-closet and bath.
21. Deadhouse.
22. New pavilion, 2 stories.
23. New pavilion, 2 stories.
24. Pavilion, 2 stories.
25. Linen and clothes for patients.
26. Medical and surgical storehouse.
27. Gatehouse.
28. Chemical laboratory, pathological and bacteriological laboratory and pharmacy.
29. X-ray and photographic rooms.

The special features of this hospital consist in the finer finish of surfaces in the wards. The pavilion marked "24" is two-storied, the lower story being for surgical cases and the upper for medical cases. The floors are of hard wood, finely waxed and polished, the walls and ceilings neatly painted, and special arrangements made for ventilation, inlets below and a long, narrow central shutter above as outlet. There are also four rooms for special cases. Near the entrance a nurses' room, a serving room, and a very complete examining and dressing room.

At the rear of this ward there are very good bathrooms, also a mess room and smoking room, the floor being covered with what seemed to be zinc. Such a floor lining is unusual, and it was not explained to me just why this material was used except that it could be kept clean. A very good ward conveyance ambulance was in the ward, the wheels pneumatic tired.

There were many amusements in the wards for the patients. As usual, all clothing worn in the hospital was furnished to the patients. The second story of this pavilion is a medical ward, and is fitted up like the surgical ward below. There were 28 surgical cases and 20 medical cases, the total of cases in the hospital being 88. The surgeon in command told me they had had about 500 cases during the war, with 19 deaths, mostly from consumption, with some few typhoid cases. Some cases of typhoid fever came from the ships and some from the barracks.

They have also a fine storehouse for medical and surgical supplies for the ships, barracks, and other places needing supplies of this kind.

The Japanese make their own tablets, and have at some of the hospitals, as at this one, machines for making compressed tablets, so that the bottles going out bear the stamp of the hospital as the maker of the tablets. The surgical supplies for ships were all especially fine, the instruments in aseptic cases and up to date in every respect.

In the storeroom I saw an American enamel bath tub, to be installed in one of the new pavilions. This would seem to mark a departure from the old wooden Japanese bath tub.

In the large surgical and medical boat boxes for landing parties were very good hand electric lamps, which would seem to be an excellent thing for night illumination for operative or other work. These large dressing cases are usually supplied only to flagships, whereas we supply the same type of box to most all ships.

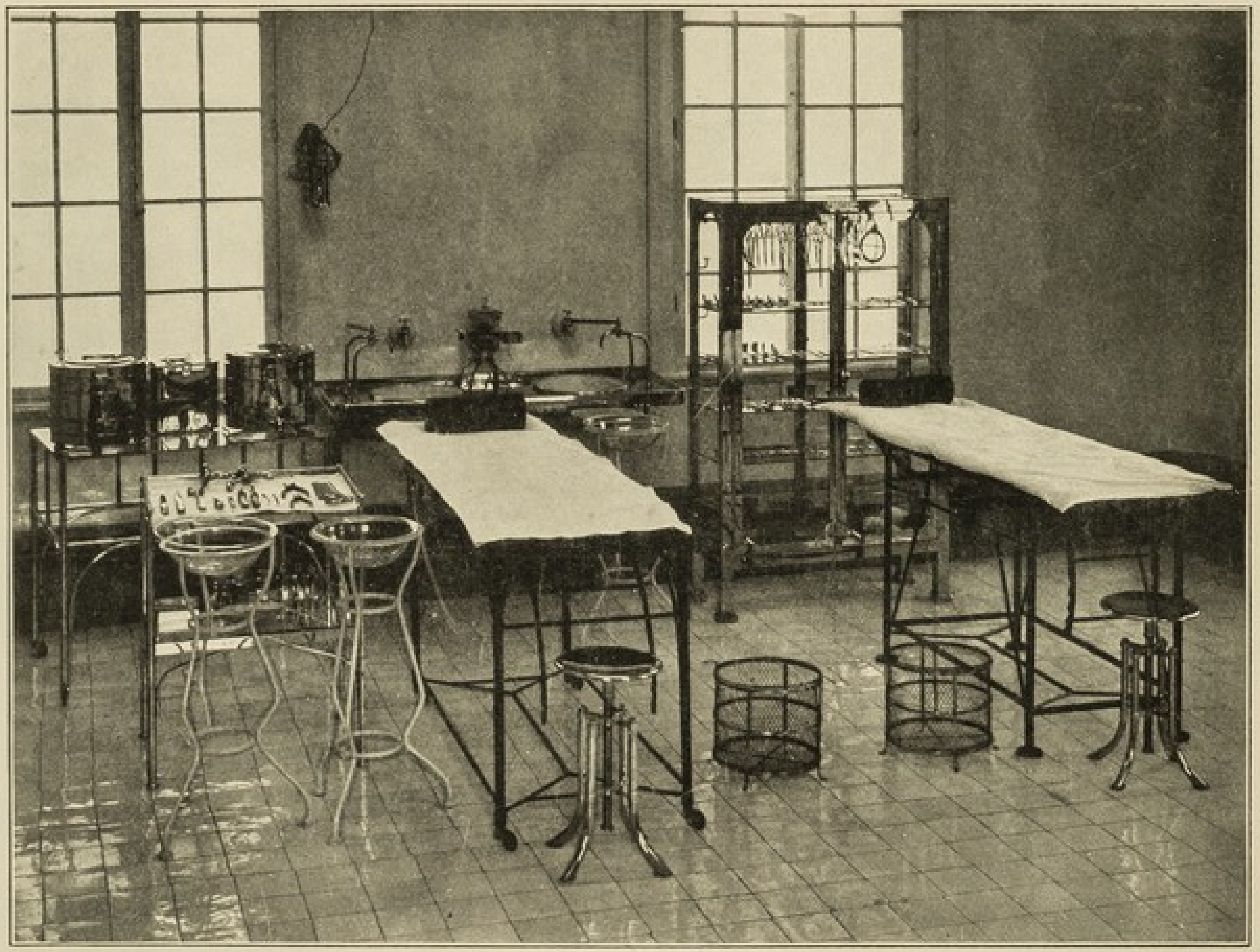
The X-ray room is new, and is a very fine one, with a new and large Siemens-Halske X-ray machine. On trying the fluoroscopic plate on a case, I found the defining power to be excellent. Certainly the Japanese hospitals are well equipped in this way. They always have, also, an abundance of fine lamps. I have seen as many as 20 or 25 lamps of large size in the lamp racks.

In connection with this room there is also a fine photographic outfit and developing room. For examples of this work, see the photographic series of pictures of Maizuru Hospital.

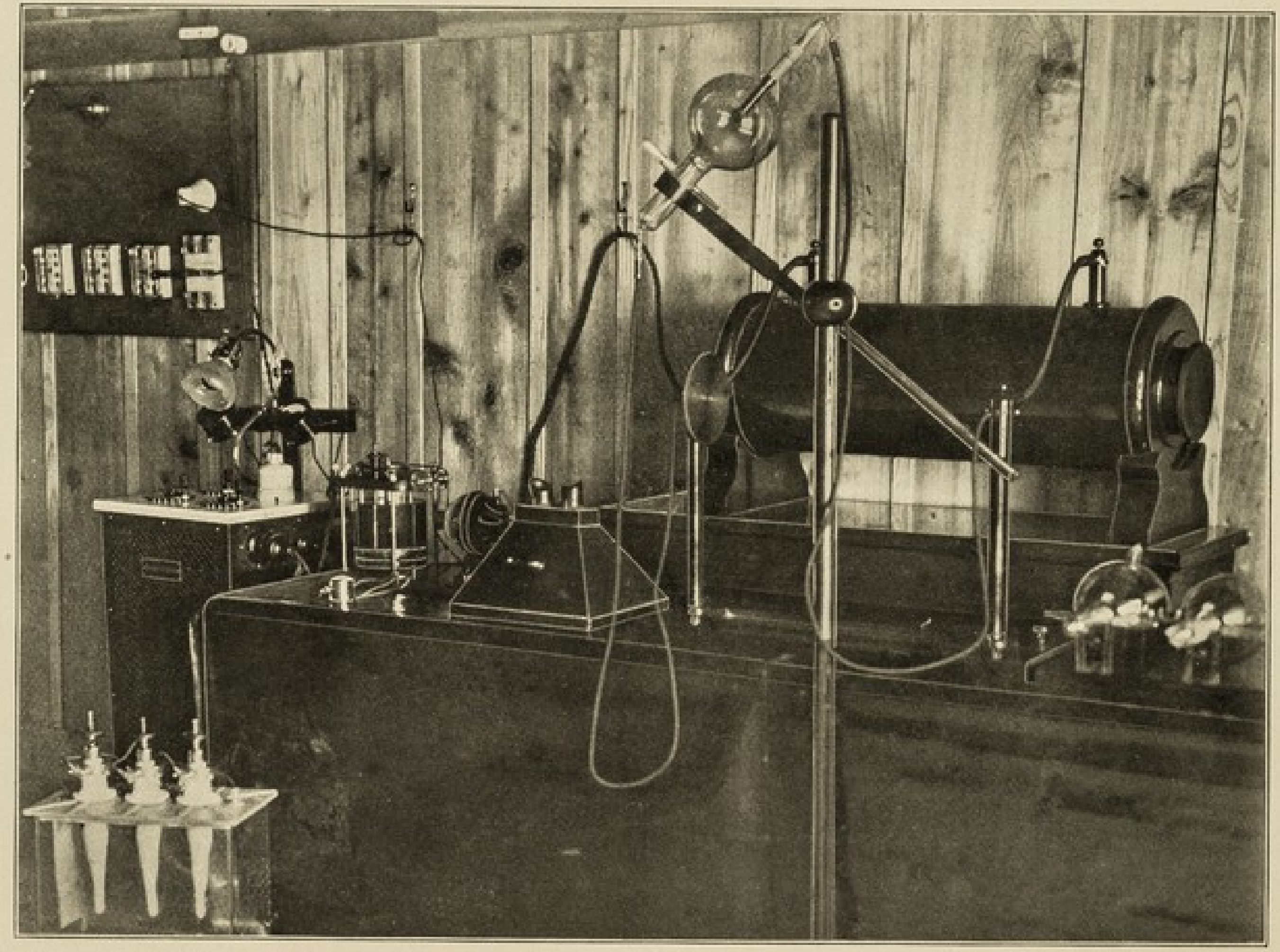
The operating room of this hospital is quite new, and it would be very hard to find any fault with it. Canvas slippers are provided at the entrance to slip over one's shoes before entering. The walls are painted, the corners rounded, there is an abundance of electric and natural light. The photograph marked "No. 43" in the Maizuru Hospital series shows the operating room in detail and gives a better idea than a written description. This is one of the best operating rooms seen in Japan.

There is a special building for the chemical and pharmaceutical laboratory and the manufacture of tablets for the service. This building is under the charge of a pharmacist, who is a commissioned officer and a graduate of Tokyo University. Just why the Japanese manufacture so many of their own preparations, compressed tablets, etc., unless for economy or accuracy, I am not sure, but the compressed tablet preparations are very perfect productions.

The bacteriological and pathological laboratories are in excellent condition, well equipped, and the usual practical and experimental

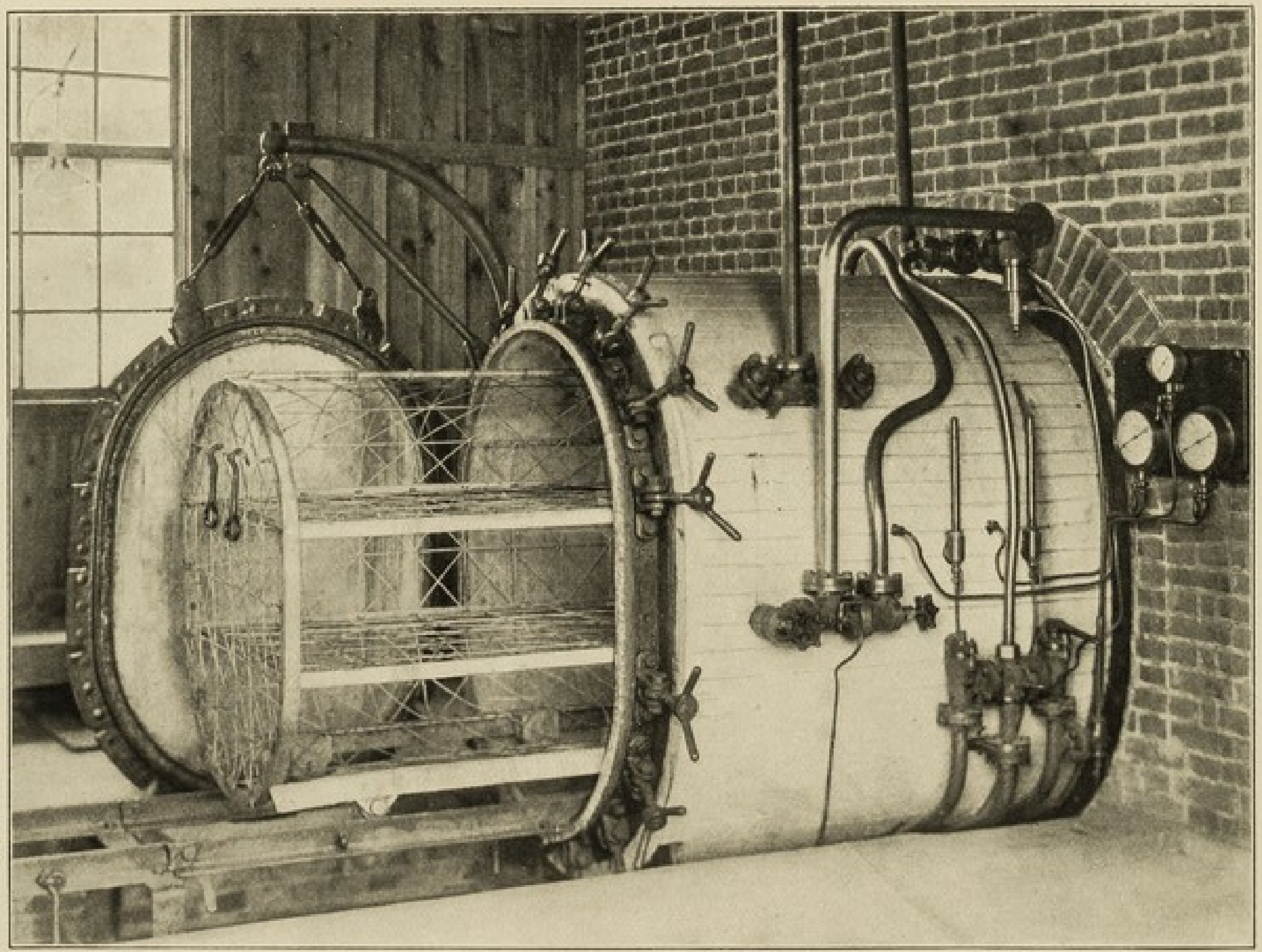


MAIDZURU NAVAL HOSPITAL, SERIES NO. 43. OPERATING PAVILION.



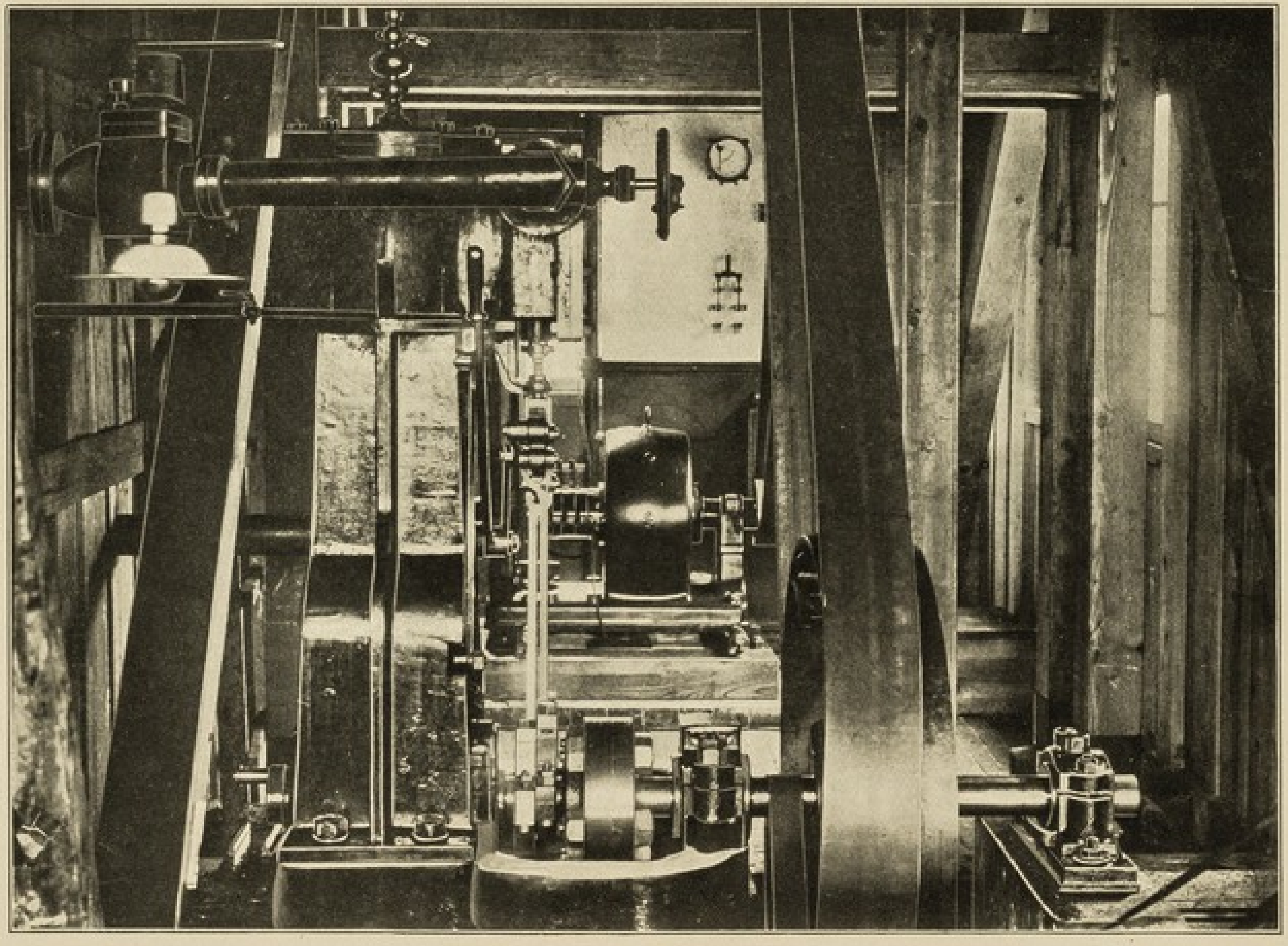
MAIDZURU NAVAL HOSPITAL, SERIES NO. 44. X-RAY ROOM.

MAIDZURU NAVAL HOSPITAL, SERIES NO. 45. SURGICAL WARD.

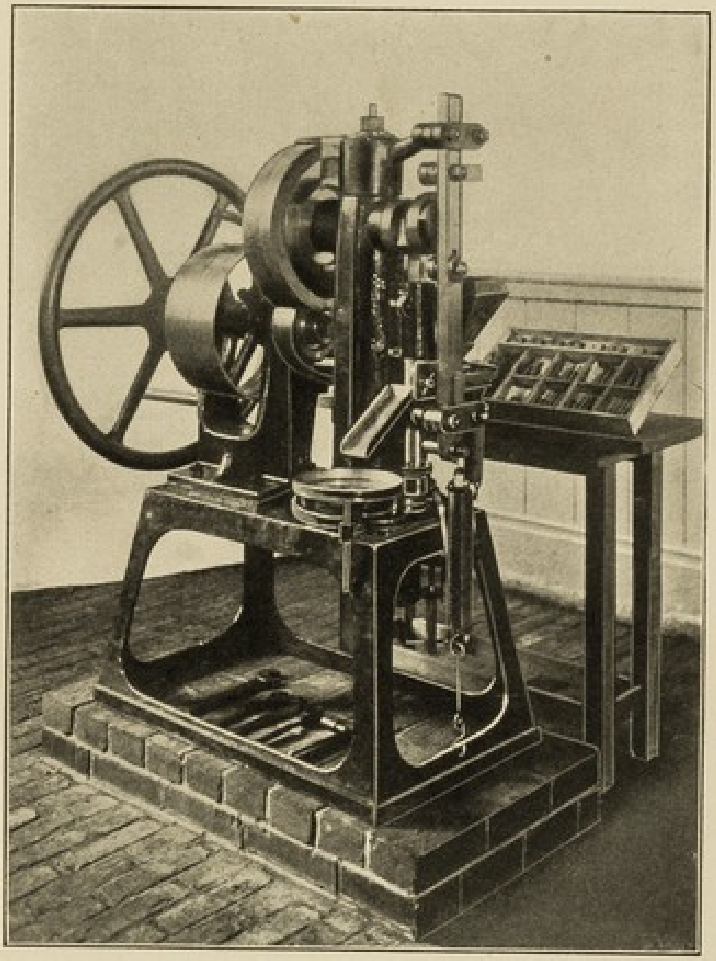


MAIDZURU NAVAL HOSPITAL, SERIES NO. 48. DISINFECTOR.

MAIDZURU NAVAL HOSPITAL, SERIES NO. 49. LAUNDRY.



MAIDZURU NAVAL HOSPITAL, SERIES NO. 50. DYNAMO ROOM.



MAIDZURU NAVAL HOSPITAL. MACHINE FOR MAKING MEDICATED TABLETS.

ks
ea
pe-
for

ce

on-

es,

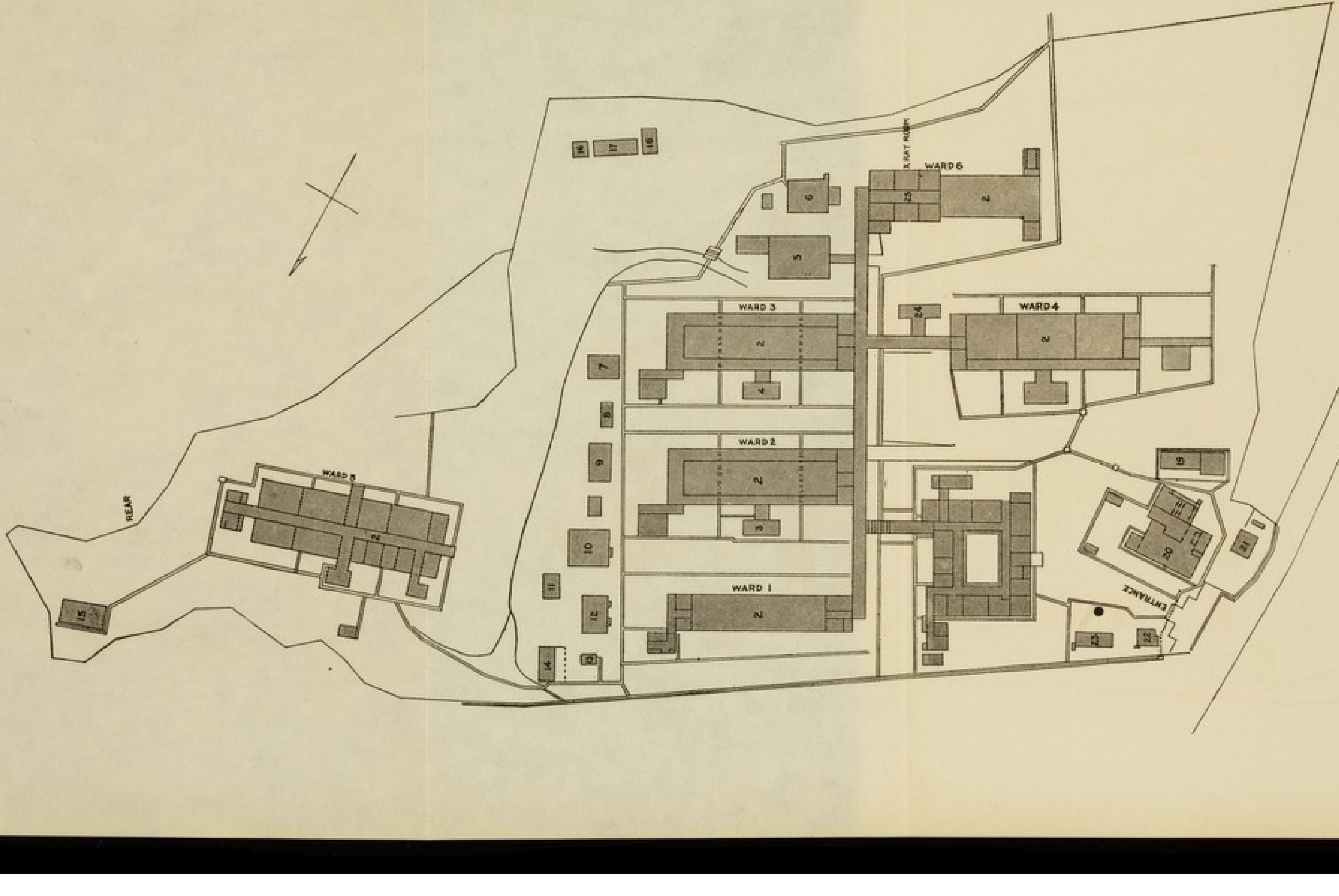
are
ase
le,
ve

ile
nd
it
of
nd
ngs

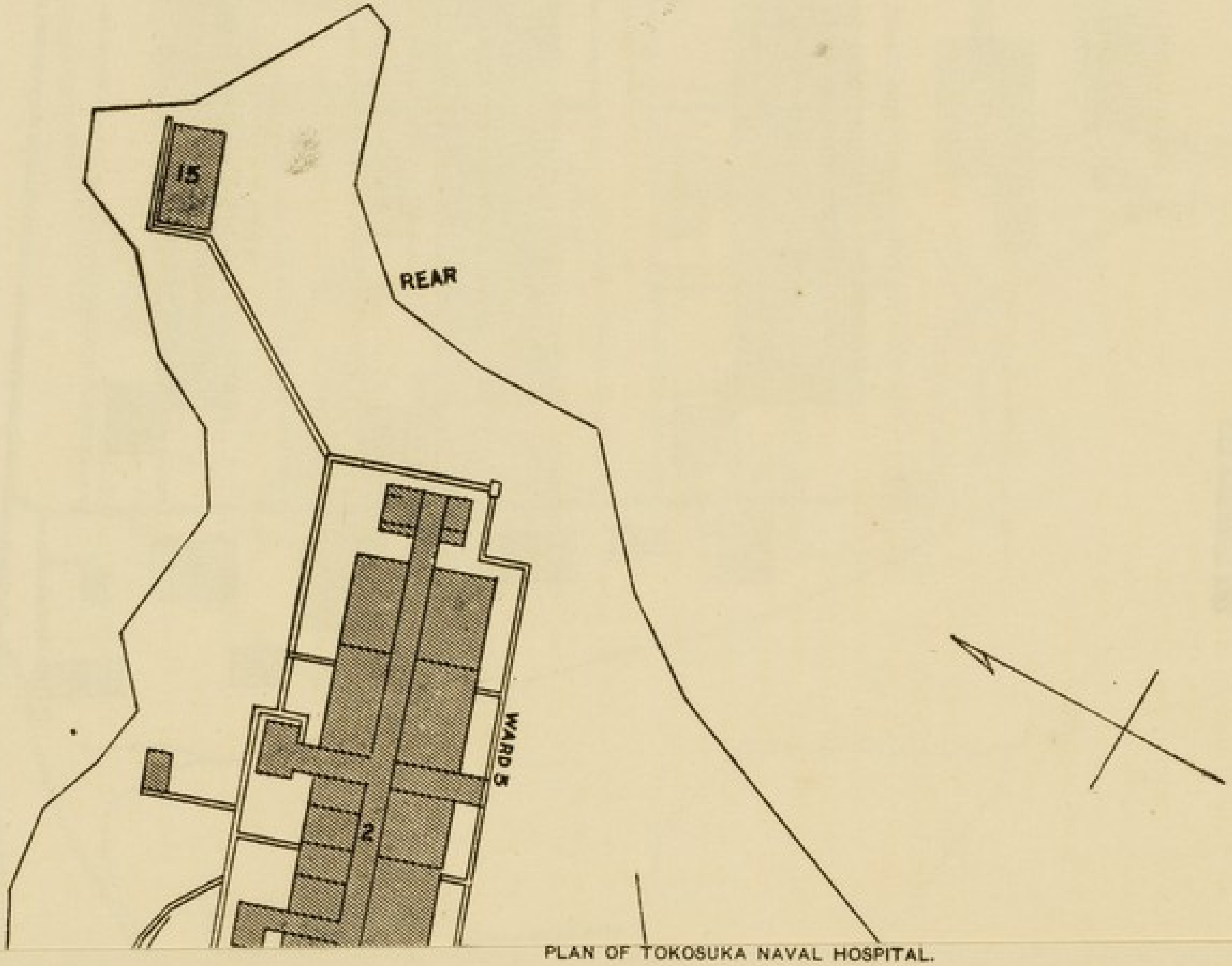
ere
in
val
the
no

her
nd
ng
es,
ard
sed

of
nd
not
for



PLAN OF TOKOSUKA NAVAL HOSPITAL.



PLAN OF TOKOSUKA NAVAL HOSPITAL.

work going on. A small but well-selected library of reference books was noted, and a well-stocked animal house with rabbits, guinea pigs, marmots, rats, mice, etc., for laboratory use. There is a special room for making aerated water, soda water, and lemonade for the use of patients.

The kitchens are particularly clean and well arranged, with a force of 6 cooks and 1 head cook.

The insane pavilion is well isolated, as seen in the plan, and contains well-padded cells for the insane.

In the infectious pavilion, besides all the other contagious diseases, all tubercular cases are isolated, and the idea seemed proper.

The two new pavilions indicated on the plan of the hospital are well under construction. They will be two stories high and increase the capacity of the hospital by 150 or more beds. On the whole, this hospital impressed me as one of the most efficient and attractive I have seen in Japan.

### YOKOSUKA NAVAL HOSPITAL.

This hospital is one of the oldest of the naval hospitals, and while the buildings are old, still it is very comfortable, well arranged, and pleasantly situated. This is outside the naval compound, and as it is the oldest has probably had some influence in the general plan of the other naval hospitals. It is entirely on the pavilion system, and all buildings of one story except pavilion No. 6. The list of buildings will show the same similarity as the others:

1. Administration building.
2. Pavilion wards Nos. 1, 2, 3, 4, 5, and 6.
3. Pathological and bacteriological laboratory.
4. Eye, ear, throat, and nose room.
5. Separate pavilion for nurses.
6. Laundry.

7, 9, 10, and 12 are storehouses for medical and surgical stores, and packing house.

13. House for experimental animals.
14. Deadhouse and autopsy room.
15. Insane pavilion.
16. Garbage burner.
17. Disinfecting plant.
18. Engine house.
19. Storehouse for patients' clothes.
20. Kitchens.
21. Storehouse.
22. Gate keeper.
23. Porters.
24. Operating room.
25. X-ray and photographic rooms.

The number of patients on March 27 was 136; of these 72 were from the fleet at the front. Of the 72, 11 only were wounded in battle, and the remaining 64 were patients from the Yokosuka naval station. Ending March 11, 490 patients had been received from the front, 70 of these having been wounded in battle. There were no deaths.

There is not much to be added to the remarks made on the other hospitals in connection with this one. The wards are clean and comfortable, some of them of peculiar construction, the ward being in the center of the structure, inclosed by glass windows and frames, and surrounding this a broad passage between the walls of the ward proper and the outer wall of the building. The passages are used as mess halls and sitting and amusement places for the patients.

The operating room is spacious, with cement floor and plenty of light, both natural and artificial. The equipment is sufficient, and there is a very good surgeons' washroom, with foot pedals for hot and cold water. There is also a good-sized sterilizing room for dressings.

The contagious ward, No. 5 on the plan, is situated on a high plateau in the rear of the grounds, and is particularly favorably placed, with an abundance of light and air. Again, the laboratory, both bacteriological and pathological, occupy an important part in the work of the hospital, and Asakawa's modification of Widal's reaction was demonstrated and is now used generally in Japan in preference to the Widal reaction.

The X-ray apparatus used here is of English make, the manufacturers, L. Millen, of London, with an 11-inch spark. It is of older and smaller type than the Siemens-Halske machine, seen in other hospitals, but the surgeon in command informed me that it worked well.

The nurses are in a separate building. No female nurses are at present employed in this hospital or at Maizuru, if I remember correctly.

The building for experimental animals is well stocked with the usual supply of animals, and much interest seemed to attach to this part of the work.

There is a set of machines for making compressed tablets, and the various storehouses are well stocked with supplies, both medical and surgical, for issue to ships. At all these storehouses the various dressings and emergency boxes, landing parties' outfits, etc., were examined and will be mentioned under a separate heading.

In general, then, it may be said that the naval hospitals of Japan are well organized, well equipped, and particularly adapted to the type of patients received, the climate, and are situated at convenient points and in specially suitable locations.

The special features that they excel in are the operating rooms and outfits, in X-ray and photographic work, in sterilization, in organization and nursing, in disinfection and apparatus for this purpose, and in bacteriological and pathological work.

At the same time it must be said that in elegance of construction and finish they do not as yet approach such an institution as the New York Naval Hospital, nor have I seen anywhere in Japan in any hospital an operating room that could compare with the outfit at the New York institution.

The methods pursued are much the same as our own, modeled usually from the German ideas. The grounds are always an attractive feature, an air of content and quiet seems to pervade these institutions, and they apparently run without friction.

It was noted that each of these hospitals had a very complete canteen, where most of the things ordinarily required might be purchased. No spirits or malt liquors were for sale.

The male or regular nurses are divided into four classes, the highest class ranking as warrant officers, the second class as petty officers, and the third and fourth classes as seamen. They are appointed at any naval station, once each year, on their own application. They must have at least a common school education, and they always receive instruction in a naval hospital for at least eight months, a naval barracks for six months, to learn military bearing, etc., and a final course of six months in nursing at a naval hospital, when they are ready for detail at sea, for ship service, or such other duty as may be required. During the war time many so-called "temporarily hired" nurses are employed. There are also always available plenty of well-trained "Red Cross" nurses for the more important work.

In concluding the remarks on hospitals it may be of interest to give a short description of a large army hospital, with the various objects of interest seen. The Hiroshima Army Reserve Hospital is selected for this purpose. This hospital is on an enormous scale; it comprises the main permanent hospital and seven divisions (all temporary pavilions), situated in various parts of Hiroshima.

The usual capacity of the entire hospital, with its various divisions, is 10,000, and it is possible to care for 12,000 patients, if necessary. The entire system is on the pavilion plan.

The main permanent hospital consists of a main administration building, where the commanding officer and his assistants have their reception rooms, etc. The pavilions are old, and many fitted up for the accommodation of officers. When the number of officers exceeds the capacity of the rooms and the usual quarters set aside for the use of officers, ordinary wards are used, and I saw quite a number of officers using the same accommodations as would ordinarily be used for men without complaint.

Among the buildings of special interest noted was one large repair shop for instruments, fitted with devices for sharpening and tools for repairing instruments, under the charge of skilled instrument repairers and makers.

A building for making powders, pills, tablets, etc., for use in the army, with necessary machinery.

An extension X-ray outfit, with large dark room, the machine used being, as usual, the Siemens-Halske (German).

A patient just brought in from Mukden with a fracture of the tibia and the bullet protruding posteriorly from the bone was placed on the table for inspection, and a large fluoroscopic plate showed the condition very well. The present X-ray machine seemed to answer every purpose well, was large, with a 50-centimeter spark, but a new and more powerful X-ray machine of the same make is to be introduced with a 70-centimeter spark. Large supplies of all X-ray material, plates, etc., were on hand; also a very complete photographic outfit, with good developing room.

The general post-office is of interest. It is in a separate building, with quite a large force of clerks. They had handled during the past month 520,000 letters, every one of which is registered.

There is an extensive outfit for the renovation of dressings that have been used and are soiled or contaminated with pus, blood, or any other infected matter. The principle of using again dressings once used has always seemed unsafe to me, but the process carried on here certainly seems to restore the dressings to a perfectly aseptic and good condition.

The dressings are brought from the various hospitals and sorted by an attendant; they are then soaked in water and thoroughly boiled in water containing soda. They are then placed in vats and covered with a solution of calcium chloride, one-half per cent, to clean and bleach, and then through a rigid sterilization, and dried. Cotton and wool, after drying, are put through picking and carding machines, and come out as fresh and clean, to all appearances, as though they had never been used. The dressings are dried in the sun, and a number of employees were spreading them out. The more important part of the work after sterilization, such as packing and rerolling, was performed by female nurses.

The commanding officer informed me that they saved about 3,000 yen a month in this way, i. e., about $1,500; also, that dressings could be resterilized and cleaned about five times in this manner before being exhausted.

The canteen is quite extensive, in a separate building, and well stocked with supplies of all kinds except spirits. Here the patients can obtain reading matter, writing paper and materials, tobacco, canned goods, and a thousand and one little things to add to their comfort and happiness. Also special dishes, with the surgeon's permission, can be ordered cooked and sent in for officers.

The large general storehouse was visited, and contained an immense supply of drugs in all shapes, dressings, surgical instruments, splints, hospital furniture, and transportation apparatus, with various surgical and medical field boxes for use at the front, nurses' emergency bags. There was a large assortment of splints, wood, metal perforated, and felting. Many articles made of bamboo were seen; thus the army bamboo stretcher with rubber apron cover, complete, cost about $1.50 apiece. Bamboo cradles for protecting injured legs from weight of bed clothes, 7 cents; bamboo crutches supplied at a cost of 8 cents.

In a separate building is the operating room. This is under the charge of Surgeon-Major Tanaka, assistant to Doctor Sato, of well-known fame, who is surgeon in command. The operating room is light and well equipped, with adjoining sterilizing and surgeons' preparing room. The floors are kept flooded with solution of bichloride of mercury, and special foot gear is worn in the operating room.

Many cases of traumatic aneurism are operated upon. Surgeon Tanaka told me that he had operated on 110 cases already. They are usually dissected out and the vessel ligated above and below and the intervening portion removed. Many interesting surgical cases were seen. Enucleation of the eye is frequent for injuries of the eye and gunshot wounds. I was shown a large bottle full of enucleated eyes by Surgeon Tanaka.

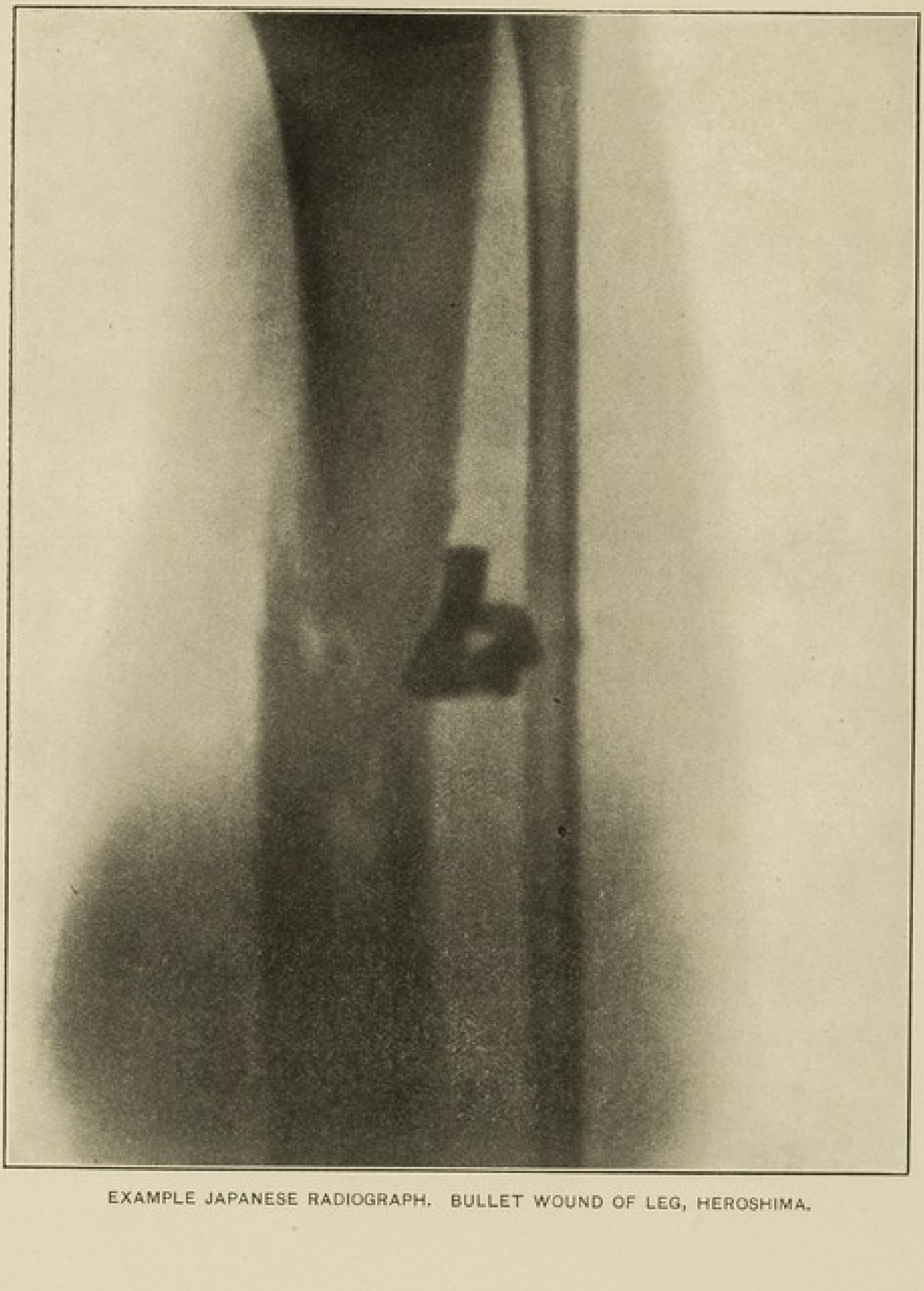
All the milk is carefully examined in the laboratory daily and thoroughly sterilized by steam in a large special sterilizer.

In the series of photographs will be found some from Hiroshima army hospital—one showing a large dressing ward and another a large dressing ward with the patients being dressed in the presence of Chief Surgeon Sato. There are also some excellent X-ray photographs of bullet wounds of various parts, together with two plates showing bullets extracted from wounds. This plate should be compared with a similar plate of pieces of shell removed from patients in the naval hospitals. The two plates are interesting as showing the difference in the projectiles producing wounds in the army and navy.

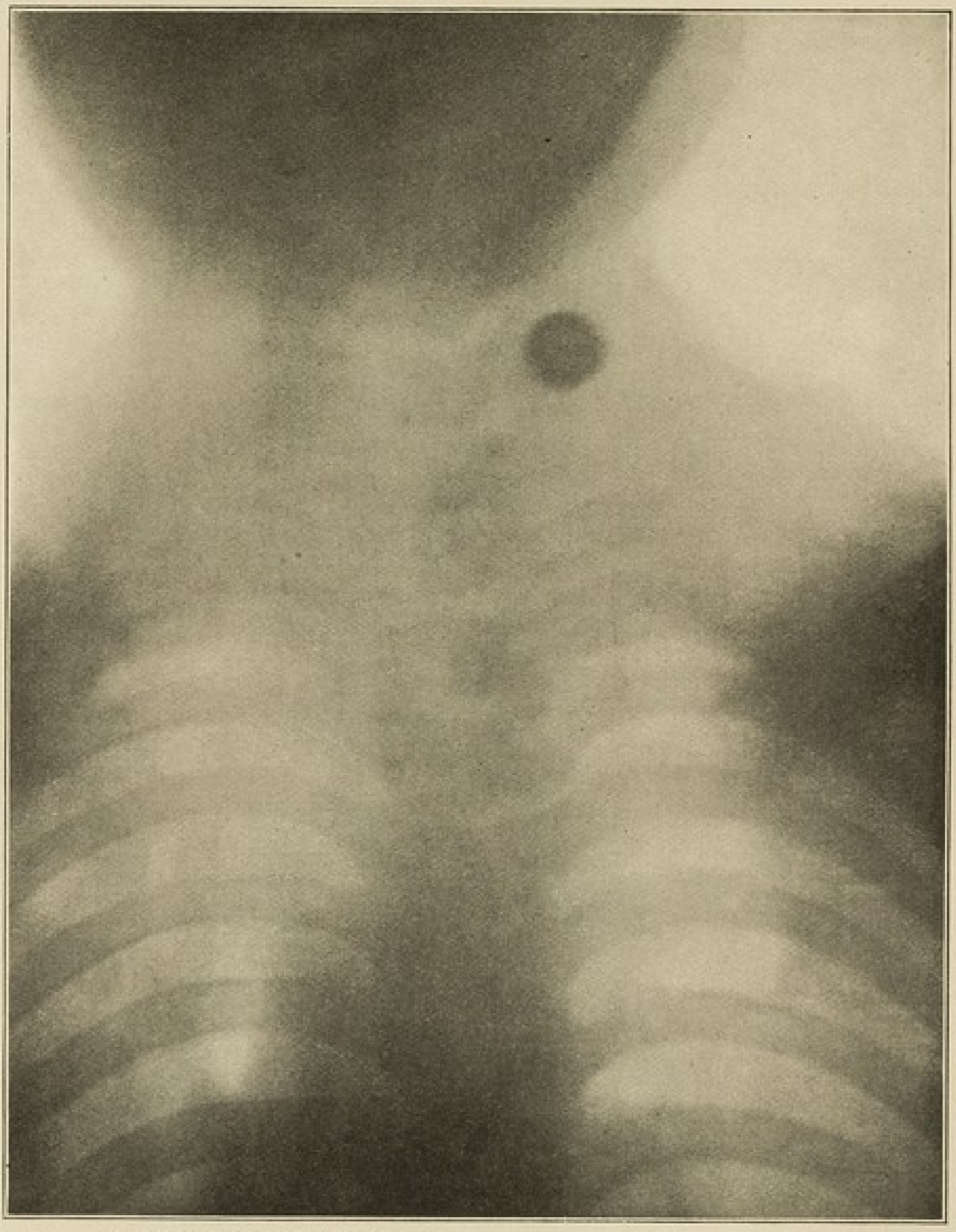
A visit to the various divisional hospitals from the main hospital was made. These hospitals are all on the pavilion plan, temporary in character, and connected by covered passageway. The third division, though small, was particularly attractive, extremely neat, even the sand between the pavilions being swept and carefully streaked.

The capacity of this division is 560 beds, and there were 480 patients under treatment. No operations are undertaken at this

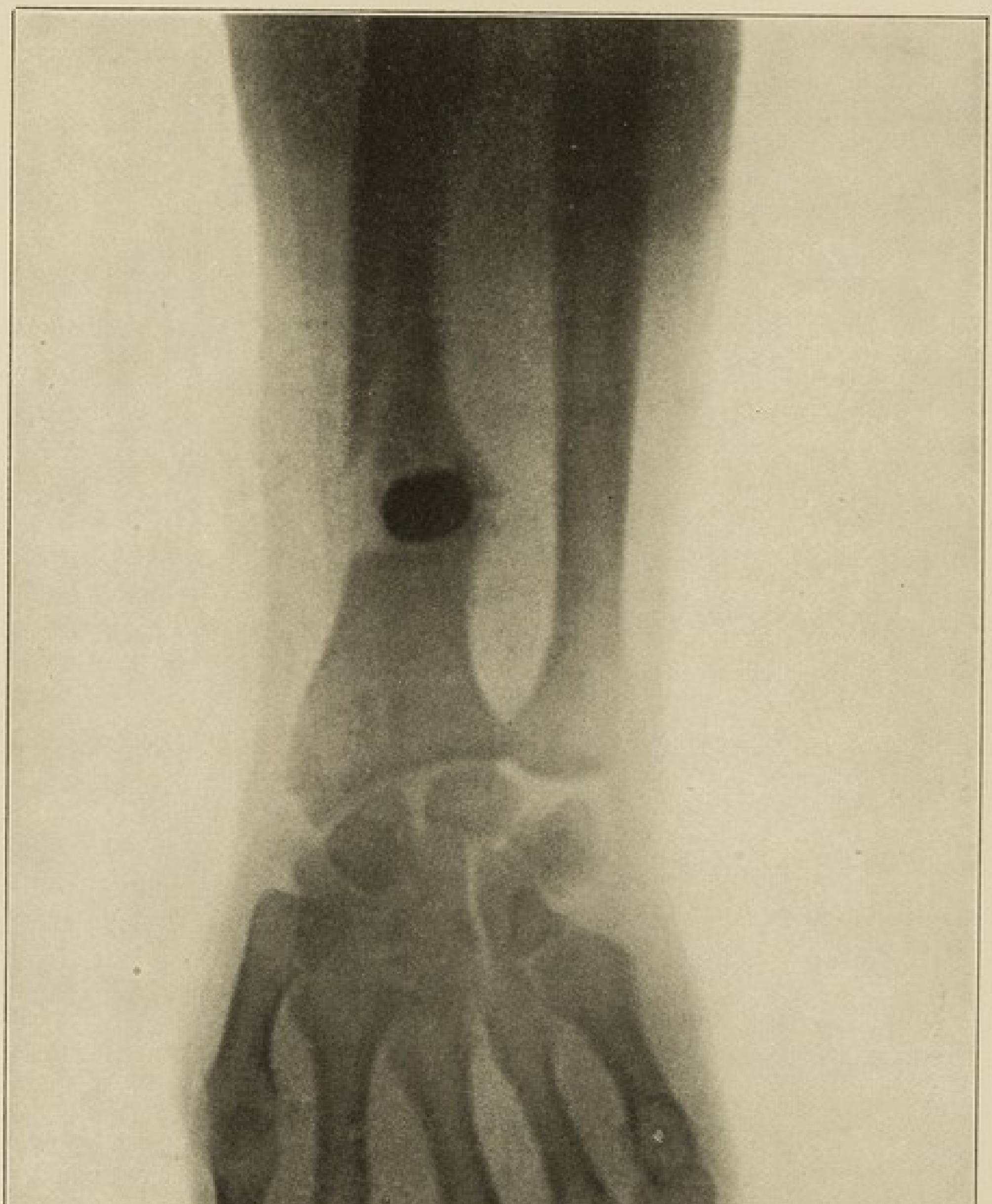
EXAMPLE JAPANESE RADIOGRAPH. BULLET WOUND OF FEMUR, HEROSHIMA.



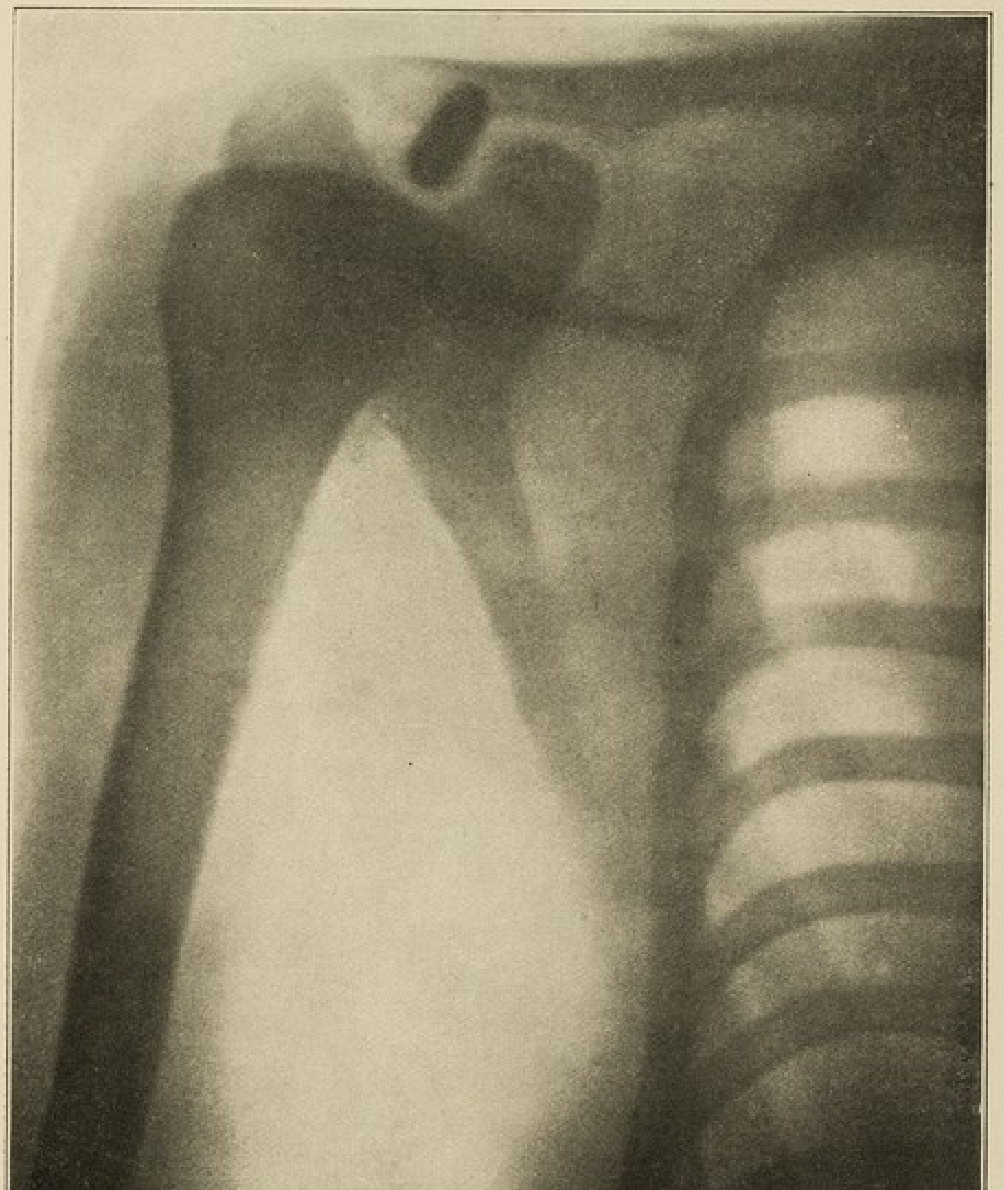
EXAMPLE JAPANESE RADIOGRAPH. BULLET WOUND OF LEG, HEROSHIMA.



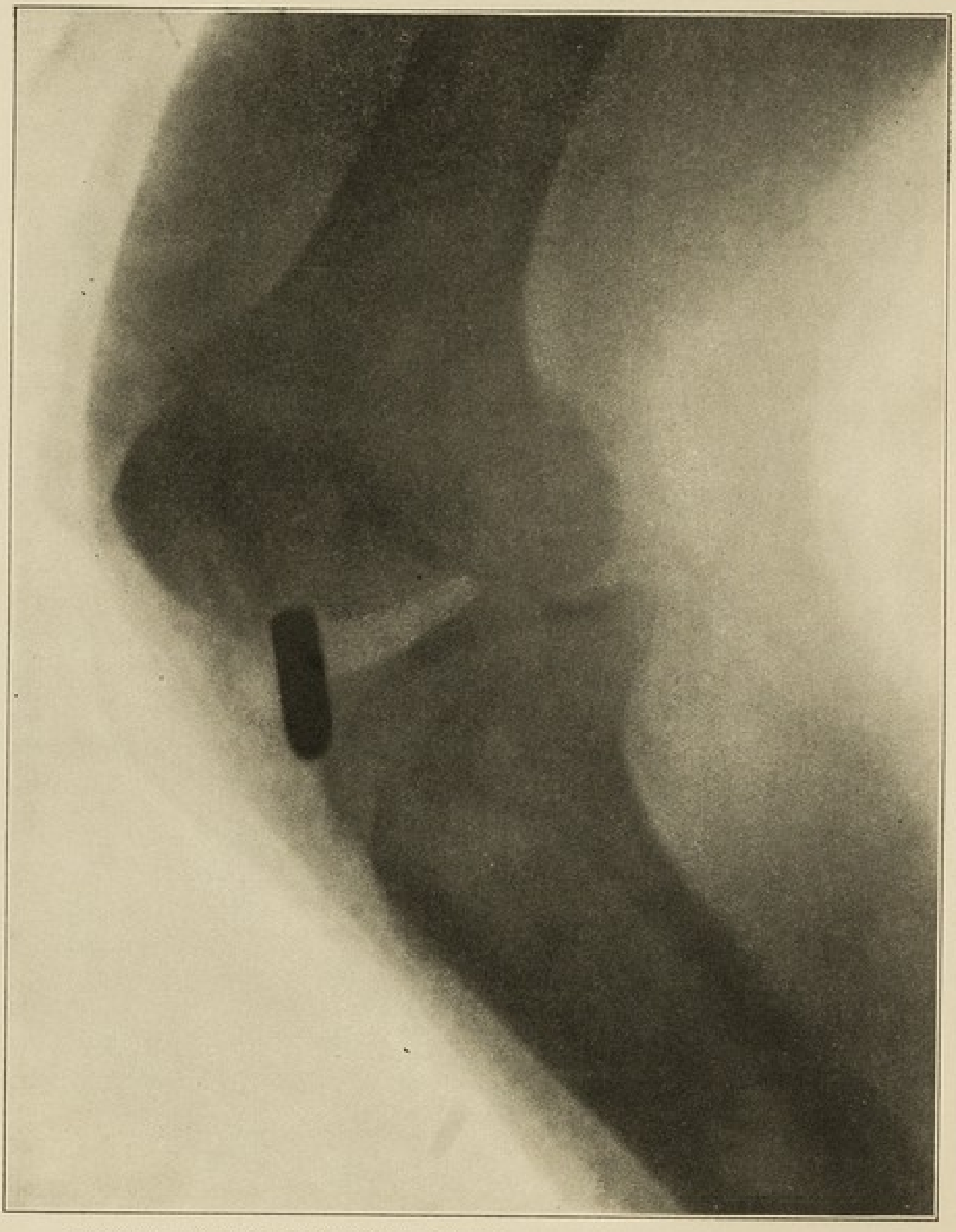
EXAMPLE JAPANESE RADIOGRAPH. BULLET WOUND OF NECK, HEROSHIMA.



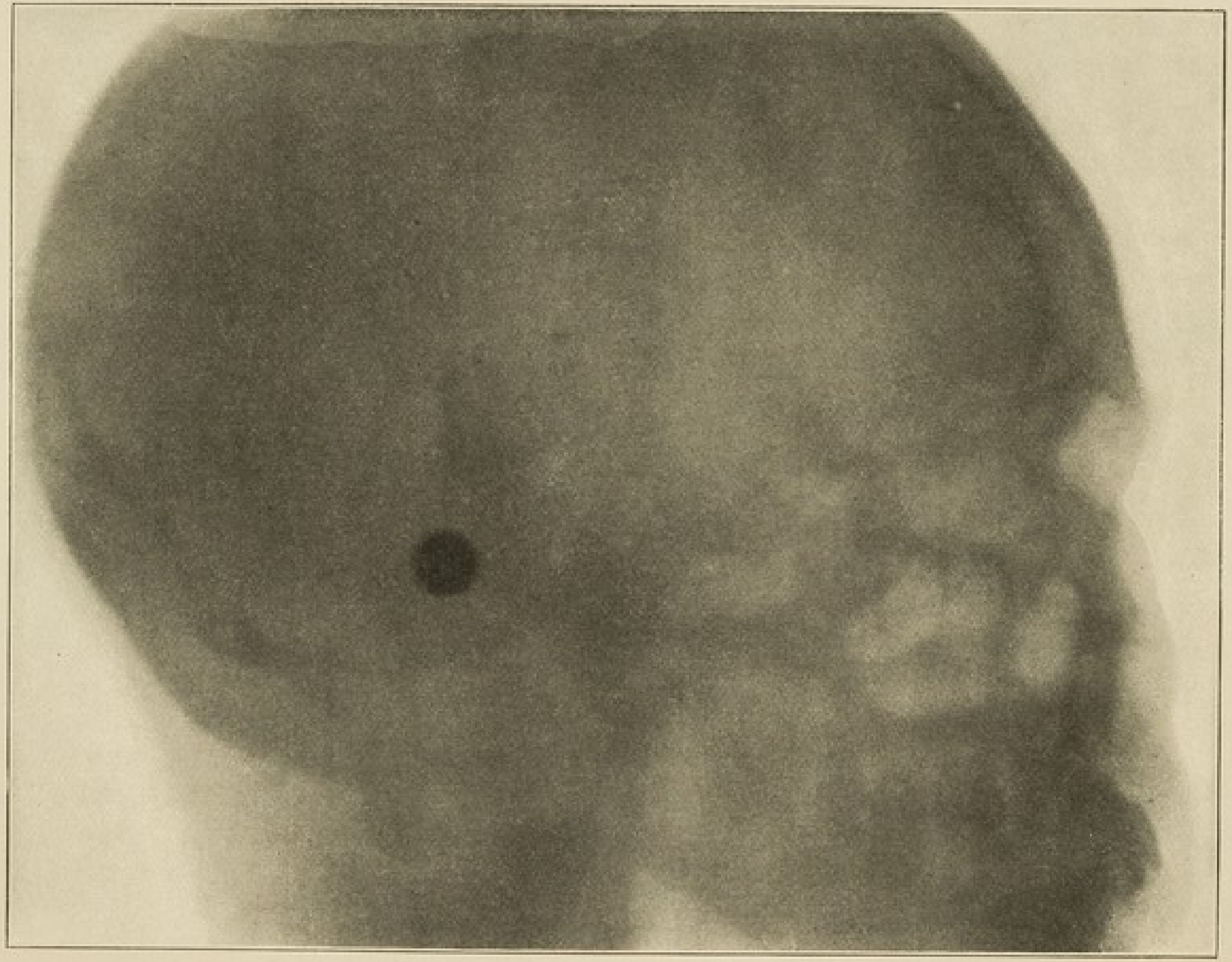
EXAMPLE JAPANESE RADIOGRAPH. BULLET WOUND OF FOREARM, HEROSHIMA.



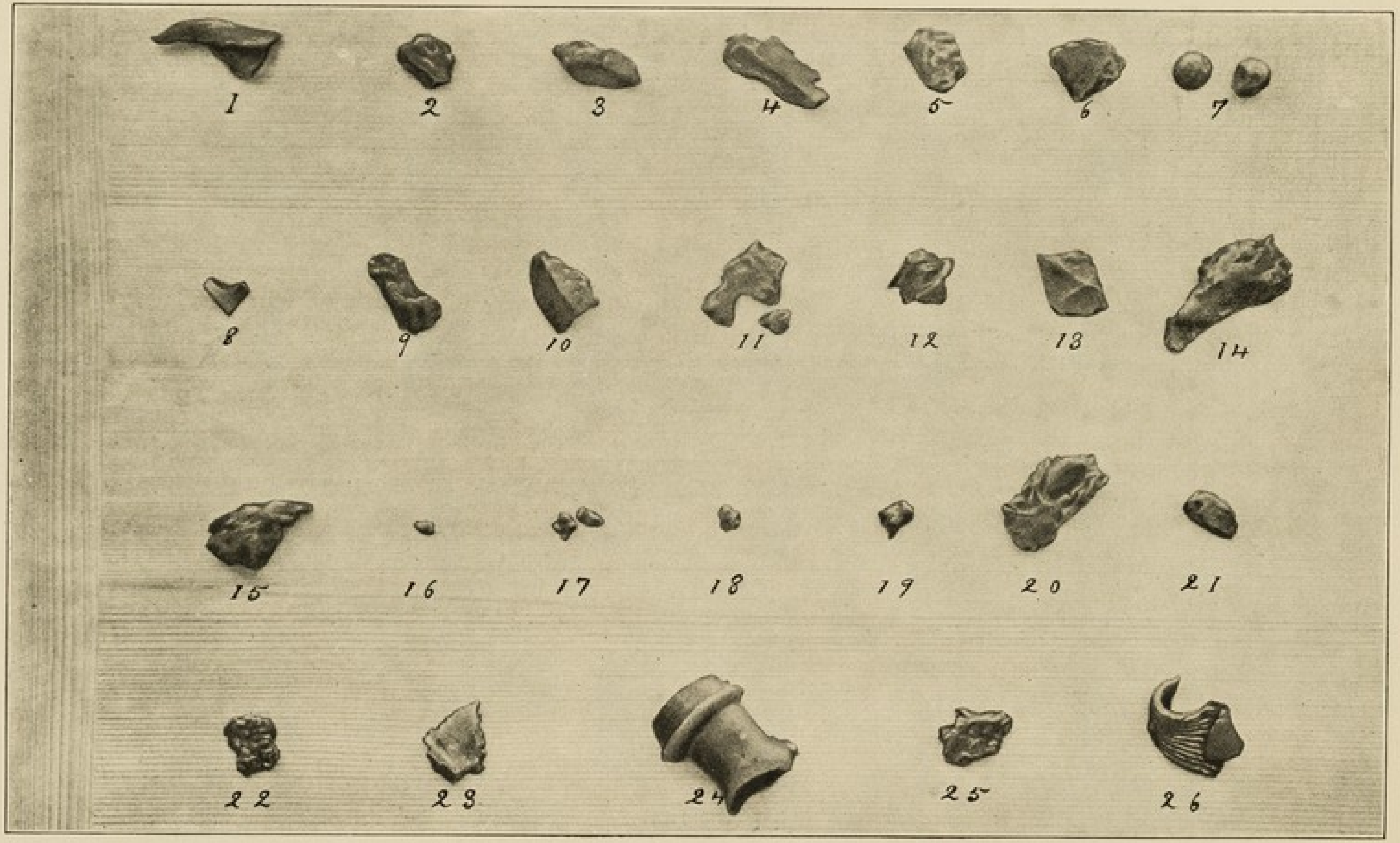
EXAMPLE JAPANESE RADIOGRAPH. BULLET WOUND OF SHOULDER, HEROSHIMA.



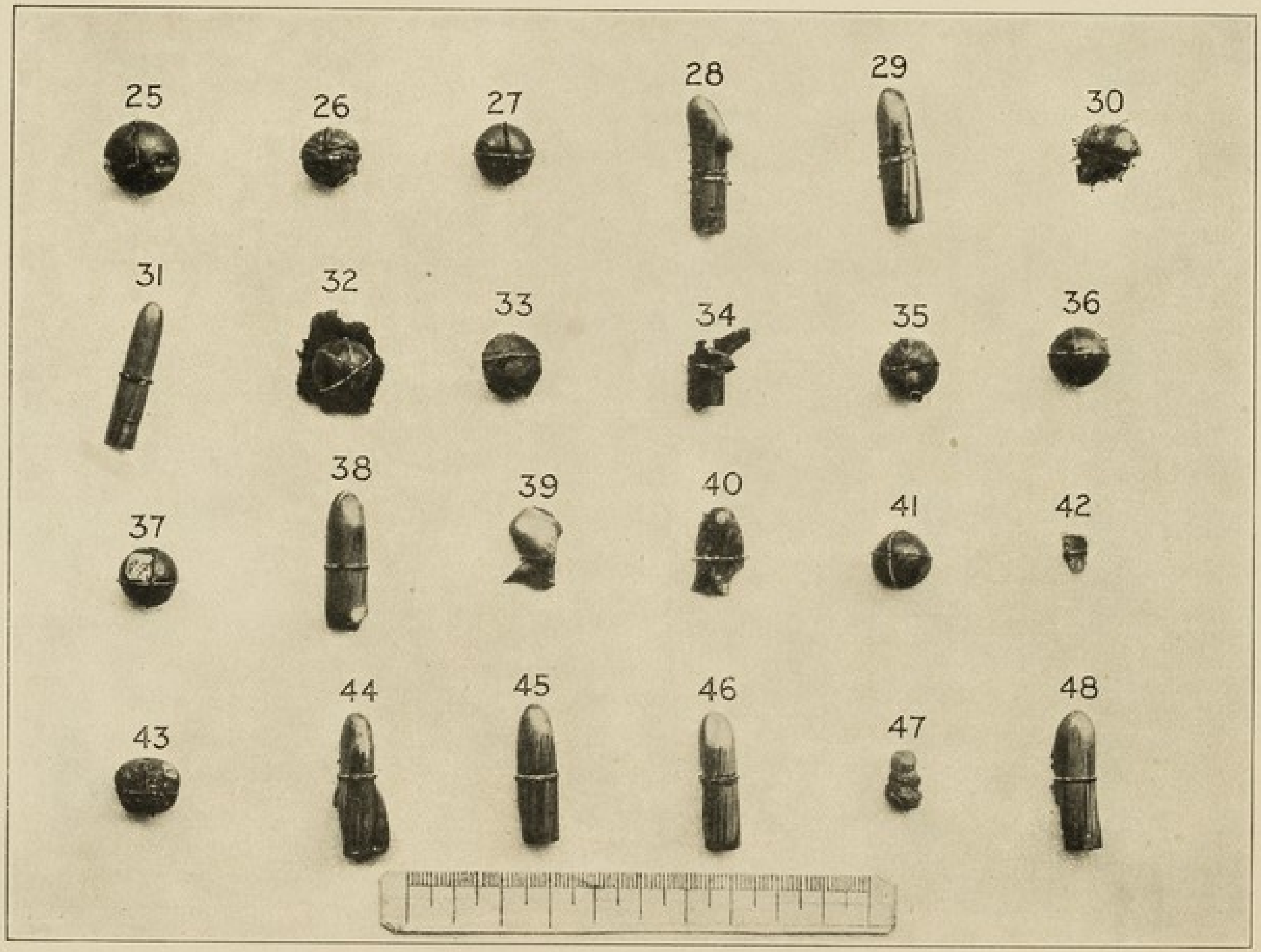
EXAMPLE JAPANESE RADIOGRAPH. BULLET WOUND OF KNEEJOINT, HEROSHIMA.



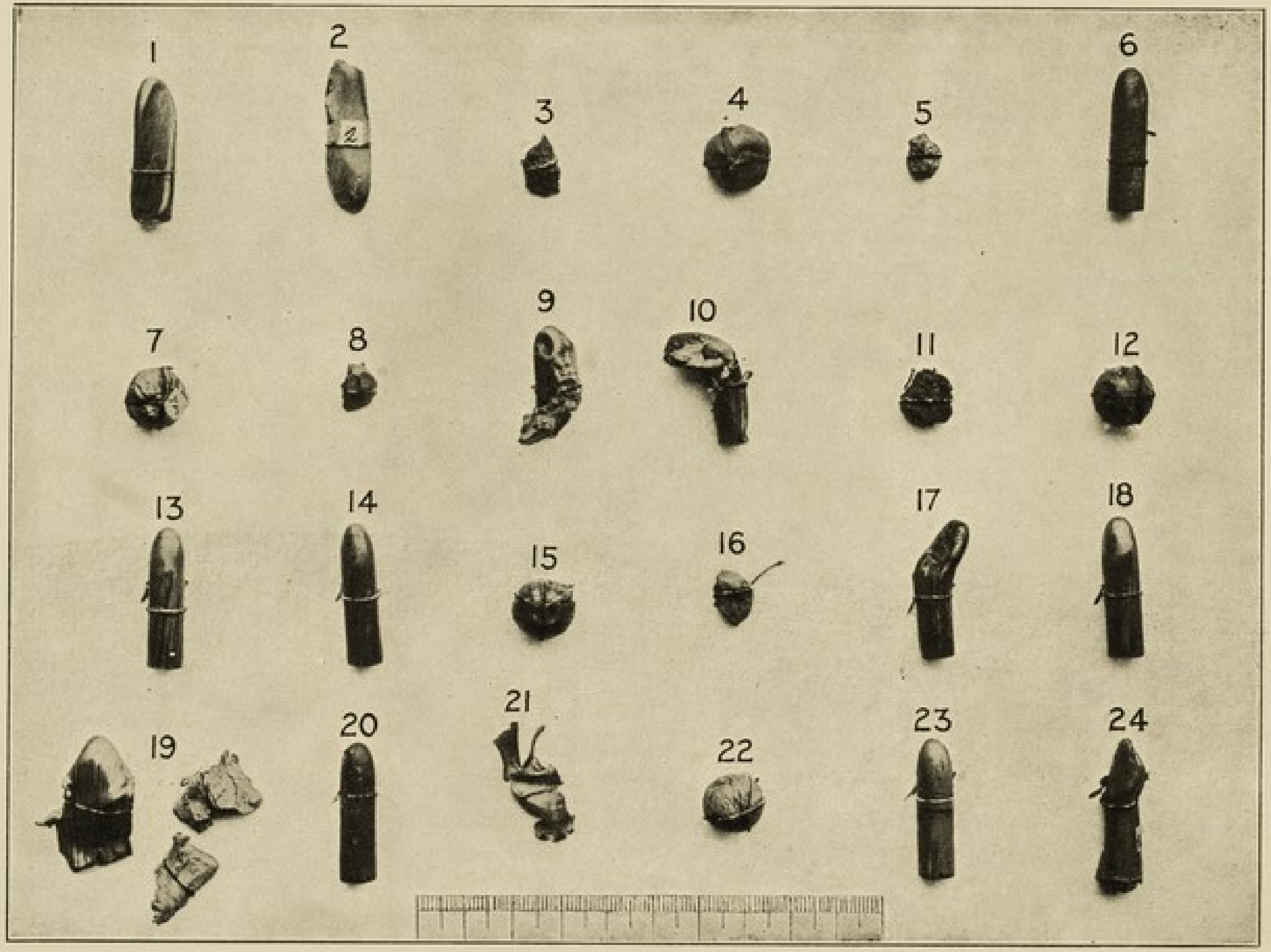
EXAMPLE JAPANESE RADIOGRAPH. BULLET WOUND OF SKULL, HEROSHIMA.



TYPES OF NAVAL MISSILES. REMOVED FROM WOUNDED AT SASEBO.



TYPES OF ARMY MISSILES. REMOVED FROM WOUNDED AT HEROSHIMA.



TYPES OF ARMY MISSILES. REMOVED FROM WOUNDED AT HEROSHIMA.

DRESSING ROOM, HEROSHIMA, WHERE 100 PATIENTS CAN BE ATTENDED AT ONE TIME.

hospital. If an operation is needed, the case is sent to the main hospital for operation. There were 10 Red Cross female nurses, 59 male nurses specially employed, and 13 regular army nurses. There are 14 pavilions and 1 administration building; also 1 very complete new laboratory (pathological and bacteriological). In each pavilion there is 1 regular army nurse in charge with 5 male temporary nurses to assist. Three of the pavilions have 3 female nurses and 6 temporarily hired female assistants and 2 male helpers.

Each nurse has about 10 patients to care for. The serious cases have a special female Red Cross trained nurse. The serious cases are always placed in the 3 pavilions attended by female nurses only. Each divisional hospital has its own pay officer, who attends to the commissariat, clothing, traveling expenses, etc. There is in these temporary hospitals 1 chief surgeon's room, 1 officer of the day's room, 1 office for (1) records, admissions and discharges, (2) business orders, (3) post-office. There is one reception room.

The pharmacy is nicely arranged with a dispensary and counter, with spaces for the delivery of medicines for each pavilion. All prescriptions are specially inspected before being issued. The Chief Surgeon Kokobu is much interested in bacteriology and showed me a growth of micrococcus which he thinks is the cause of kakki. He finds the micrococcus in the blood, urine, and feces of kakki patients constantly and in no other cases. His associate, Surgeon Okada, thinks the same, and both look on kakki as a toxemia from this micrococcus.

There is a fine large amusement room, tastefully decorated in Japanese style, and stocked with various Japanese games. The room can also be used for lectures and music. A neat little complaint box was noted for the patients to drop written complaints in. These complaints are addressed to the chief surgeon and seen by no one else. The idea was to promote confidence between the patient and chief surgeon. No one has access to the complaint box but the chief surgeon.

A senior and trusted patient in this hospital looks after the conduct of the patients; also reports to the chief surgeon any lack of care and kindness on the part of the nurses toward the patients. The chief surgeon thinks the pavilions under the charge of the Red Cross nurses are models.

The temporary pavilion consists of a pine structure of one story, unpainted, about 3 feet from the ground and resting on piles. They may consist of one or two wards. At the entrance to the ward is a nurses' room, a serving room, and a medicine room. The wards contain from 40 to 50 beds, built in Japanese style, the body of the bed being an ordinary box. The legs are of wood, and the height of the bed about 2½ feet. The wards are light, as the sides of the pavilion are largely composed of glass windows. The wards are usually heated by one or two Japanese stoves, which consist of charcoal embers in ashes, the whole being incased in a receptacle of some kind, generally known as an hibachi. Food is brought from the kitchens in conveyance boxes, covered to keep it warm, and served at the bed. In the rear of the ward are the usual Japanese closets and baths. Sometimes a pavilion will be split up into small rooms for the care of specially serious medical or surgical cases. The beds in these hospitals usually have a mattress, 2 quilts of cotton wool, and 2 woolen blankets, with a Japanese pillow.

The sixth division, Hiroshima army reserve hospital is the largest of these temporary hospitals. It has 33 pavilions, with 72 wards and a capacity of 4,500 patients. There were 1,300 patients in the hospital the day of my visit. It contains 2 large amusement rooms, has a very large dressing ward, where 200 patients can be dressed at one time, a special bath house with 10 bathrooms in Japanese style, each room accommodating about 30 bathers at a time.

This hospital is a reception hospital, and so situated that patients can be brought directly up the river from the hospital ships or transports to it. They are bathed, given hospital clothes, their records verified, and from here distributed to various hospitals.

Each division hospital has a well stocked canteen in a separate building in the grounds.

A fire brigade stands watch day and night, to be ready in case of need.

### BATTLE SHIPS AND CRUISERS.

Through the kindness of the surgeon-general, permission was granted to visit such men-of-war as might be in any of the Japanese harbors. Very few of these ships were present at the time of my visit. One battle ship, one second-class cruiser, and one third-class cruiser were visited—one at Maizuru and two at Yokosuka.

The points particularly desired to be investigated were the arrangement of the medical department—the outfit, the provisions for the care of the sick, the personnel, the arrangements for the care of the wounded in battle, and the transportation of wounded.

As most of the Japanese ships are of foreign construction, it is not surprising that they differ but little from our own, and aside from the actual experience gained in war there is little that is new or particularly instructive in these ships so far as relates to the medical department.

The battle ships usually have three medical officers—the larger cruisers two or three, and the smaller cruisers one. There is no one corresponding exactly to our present hospital steward. There are usually two or three nurses, the surgeon doing his own compounding or detailing such parts as may be safe to a senior nurse.

With the fleet there is one surgeon-general. In this connection it is to be noted that the Japanese have one surgeon-general of superior rank, who is known as the director-general of the imperial navy, and four secondary surgeon-generals, who are placed at different naval stations, such as Sasebo naval hospital, at Port Arthur, at Yokosuka, and one with the fleet, so the use of the term surgeon-general, unless understood, is somewhat misleading. There is also one expert pharmacist with each fleet and one dentist.[a]

The arrangement of the sick bay is usually on the berth deck forward, as with us, and they contain a few bunks, a larger number of hammock hooks from which to swing hammocks, an operating table, desk, a small dispensary with a limited amount of drugs and dressings, a closet, and that is about all. A storeroom for drugs is usually located in some other part of the ship, usually on a deck below the

---

[a] Note by Director-General Saneyoshi: "There are three or four expert pharmacists of commissioned rank in each naval hospital (not with fleet). A dentist in each fleet is hired only recently for a trial, so we can not say whether it will be continued or not at the end of the present war."

WARD OF TOKYO RESERVE HOSPITAL.

JAPANESE TEMPORARY HOSPITAL.

berth deck. The choice of dressing stations in battle depends on the character of the ship.

Concerning the management of the wounded on men-of-war during action the following is submitted from the surgeon-general:

> *Dressing stations on men-of-war during actions.*—Dressing stations naturally differ according to the kind of the vessel, but at least two are fitted up in each vessel at places most convenient to bring in the wounded. Cases of bandaging material are sometimes placed at localities difficult of access, such as the engine room, passages to the magazine, etc.
>
> Dressing stations are selected at places safe from the enemy's fire and most convenient to carry in the wounded. They are generally placed within the protection of the side armor and above the water line. Of course it is impossible to select safe places in unarmored vessels. In the majority of vessels one dressing station is fitted up forward and another aft, one under the care of the chief surgeon and the other under the care of his second, assisted by nurses, sick-bay attendants, and such detail as may be made. The method of treatment is the dry sterile bandaging, but there have been some exceptions. During actions, major surgical operations are not generally made, but on some rare occasions such operations have been made. The size of the dressing stations differ, according to the size of the vessels, and except in some few cases it is difficult to get sufficient spaces for the purpose. In armored cruisers and battle ships a dressing station and a room adjoining to it generally has a space sufficient to take in 50 wounded. Special attention is paid to the ventilation of these rooms.
>
> *Lighting of dressing stations.*—Lights of such rooms are increased by one or two electric lamps of from 16 to 32 candlepower and one portable electric lamp. Besides these, several candles are also lighted to be prepared against sudden extinction of the electric lights.
>
> Every dressing station is fitted with operating tables. For this purpose dining tables are used, but most of the larger vessels have light iron operating tables. It is very inconvenient to bring medical materials from the dispensary in time of action, and most of the vessels have them stored at places near the dressing stations.
>
> The materials and appliances for dressing stations differ more or less according to the opinion of the surgeon in charge, but each dressing station is equipped with materials sufficient to give first aid to the wounded, together with materials necessary for surgical operations which may be required during actions. It is found convenient also to have surgical instruments in comparatively well-protected spaces rather than in dispensaries. Bandaging materials are disinfected once a month to keep them disinfected as far as possible, and in case an engagement is expected they are disinfected on the day before. It is also necessary to have a large quantity of drinking water to give to the wounded. As splints in time of actions, tin perforated splints, to make them light and to promote evaporation, are found very convenient. They are cut to required sizes with scissors.
>
> As carriers for the wounded, cooks, stewards, mess attendants, rope repairers, and fire brigade are employed, and the regular nurses and sick-bay attendants assist the surgeons. In a flagship which has a naval band, members of the band are also employed as carriers. They are trained to give first aid to the wounded, and are more careful and better suited to be carriers than any other branch. During an action one-half of the carriers are placed on the upper and middle deck at safe places, such as behind casemates of the engaged side, behind the unengaged side of the conning tower, etc., and whenever any casualties occur they are sent from there to bring in the wounded. The number of carriers differs according to the size of the vessel, and generally half of the carriers of a vessel are placed within the protected part of the ship.
>
> *Method of carrying the wounded practically used.*—The wounded, both those who can walk and those who can not walk, are carried to dressing stations by hand. A kind of stretcher made of split bamboo was tried, but hand carrying proved to be more convenient. In case of carrying mortally wounded or the dead, the stretcher was found very serviceable. To remove the wounded from a ship to a boat they are fastened to ordinary stretchers and are lowered down from davits. They may be carried down the ladder, but bamboo stretchers were found more convenient.
>
> Each carrier is furnished with four small bundles of gauze to give first aid to the wounded. Carriers are also provided with a piece of india-rubber hose about 3 feet long to stop bleeding when necessary, at the rate of one piece for every three or four carriers, but the hose was very rarely used.
>
> In the navy, larger bundles of gauze are desirable. The treatment of the wounded by carriers is only to dress a wound so as not to expose it.

Some very unfortunate accidents have happened during the various engagements. Thus on the *Hiyei*, at the battle of the Yalu, a shell exploded in the ward room, which was being used as a dressing station, killing the surgeon and his attendants and destroying the dressings and surgical instruments.

During the present war, as a rule, the Japanese surgeons have found it usually practicable to perform operations during action, but it is fully realized that this was only possible on account of the small number of wounded. On the other hand, on some of the Russian ships the loss of life was so great and the wounded so numerous that the surgeons, I am told, were completely paralyzed and unable not only to perform operations, but even to make the necessary dressings.

After careful consideration of this point with many naval surgeons the idea of immediate operation is not considered to be feasible. The fact that naval battles are not, as a rule, of long duration, that the attendant confusion would detract from the ability of the surgeon to do his best for his patient, would seem to make it far preferable to delay operation if possible until after action had ceased, giving careful first aid to the wounded and seeing them placed in protected places, where they would not be tramped upon or further injured by any of the accidents attendant on the engagement. Cases of severe hemorrhage or wounds threatening life would of course be exceptions to this rule and require immediate attention. Such, in the main, has been the principle upon which the Japanese have acted.

Usually the larger part of the dressings and drugs are kept below decks in a storeroom where they would be safe from harm and could be drawn upon if any accident should occur.

Before battle the crew are said to be especially prepared; thoroughly bathed and clean clothes put on, to prevent as far as possible the contamination of possible wounds from dirt or infected fragments of clothing. First-aid packages are issued to the crew and carriers, who have been instructed in their use. The first-aid package is practically the same as ours—with bandage, compresses, safety pins, and triangular bandage.

In battle ships and armored cruisers, places for dressing stations are carefully selected in protected places, but in unprotected cruisers the wardroom is usually selected as the dressing station. On the *Chiyoda* the surgeon very kindly fitted up the wardroom completely as they do in time of battle. The mess table was used as the operating table, and all dressings, anæsthetics, restoratives, sterilizer for instruments, etc., were placed in easy reach. Irrigators and solutions, with basins and pans, were ready for use. The instruments were in a modern wooden aseptic case, although they have now many fine metal cases. The stretchers were the ordinary bamboo and canvas stretcher, which is shown under the head of transportation methods.

It is to be noted, however, that in actual battle the Japanese have found that stretchers are usually troublesome and delay the rapid conveyance of patients to the surgeon, so that many are simply picked up by hand and carried in this manner to the dressing station. The Japanese usually have an abundance of dressings, good long bandages, gauze, and lint ready to use, and first-aid packages. There are quantities of gauze and other pads ready to apply at once. The tourniquets in the storehouses shown me were those of the American navy pattern, with the black wooden ball and canvas strap. Pieces of elastic tubing are also freely distributed to the carriers to use as tourniquets.

The number of carriers, who can also apply first aid, of course, varies with the size of the ship, but usually there are from 40 to 50 in a good sized battle ship. Thus the surgeon has plenty of aid, and is expected only to look out for the wounded as they come to the dressing stations.

After battle the wounded are transferred as soon as practicable to one of the hospital ships, which is usually at hand, or to a temporary or base hospital. As soon as their condition will permit, they are sent to one of the home naval hospitals, and kept there until their condition allows them to go to their homes or return to the service, as the case may be.

In places difficult of access, such as turrets, the engine room, and magazine passages, substations are established to give immediate attention to the wounded in these localities.

When compared with the elaborate outfits that are installed on our own modern battle ships, it is difficult to see what we could adopt of special value. The Japanese outfit is efficient, but it would be difficult to place any of them in the same class as the outfit on such a ship as the *Ohio*.

The Japanese fully realize the necessity for placing the sick bay, operating room, etc., inside the protected parts of battle ships and cruisers, and are agitating this point for future construction. The possibility of total destruction of surgeons and outfit, under present conditions, on most of the ships is obvious. Some of the cruisers, I am told, have the sick bay and medical outfit nearly amidships. The necessity for the transfer of all material, instruments, and surgical outfit at time of battle, to remote dressing stations is a great annoyance, and makes much unnecessary work, lowering the efficiency of the department.

The food furnished on the Japanese ships seems to be well cooked and of sufficient quantity; the galleys were clean and neat. Artificial ventilation is not attempted in many of the ships. Heat is usually furnished by grates in the cabins, and by the Japanese stoves in other parts of the ship, where there is any attempt to furnish warmth. The water is usually supposed to be distilled, but this is not always the case. When the water supply is supposed to be pure, the tanks are often filled from shore.

The men are encouraged to bathe and keep clean, and bathrooms are supplied for this purpose. The men coming off duty in the fire room, take a bath at once, and get in clean clothes. I could not find that "shower baths" were used in any of the ships. The crew, when not provided with baths, use salt water in buckets. The supply of fresh water for washing clothes is limited.

Altogether, the arrangements for heat, washing, and bathing in the ships visited, were primitive. The beds were clean and sweet-smelling, but not attractive.

### PORTABLE EMERGENCY OUTFITS.

The emergency bag for surgeons is a neat little black leather bag, with shoulder straps, that can be used on landing parties or otherwise; it contains 1 bottle sulphate morphia; 1 hypodermic syringe; 1 small aseptic metal instrument case, containing 2 scalpels, 1 curved bistoury, 1 pair dressing forceps, 1 silver catheter, 1 pair scissors, 1 saw shutting like a knife, 1 probe, 1 grooved director, needles, silk, and thread.

The nurses' emergency bag is larger, and contains 1 large knife and saw for making or trimming splints, etc.; 1 medicine box containing 1 bottle brandy, 1 bottle carbolic acid, 1 bottle stomach pills (soda and gentian), 1 bottle acids salicylic and boric, mixed (1 to 3), 1 box antipyrine tablets, 1 box Dover's powders, 1 box Johnson's adhesive plaster, 1 tourniquet (American Navy pattern), 1 pair scissors, 4 first aid packages, 4 packages absorbent cotton, 3 triangular bandages, 6 gauze roller bandages (2½ inch), soap, candlestick and candle, safety pins, and matches.

The first-aid package contains 1 bandage 3 meters long, 2½ inches wide, 3 pads of gauze, safety pins, and 1 triangular bandage; the whole being protected by oiled muslin and outside protective wrapper.

In the storehouses are found two sets of emergency outfits: (1.) For issue to transports consisting of 1 large surgical case, 1 large medical case. (2.) For issue to battle ships and for issue to landing parties, etc., I large surgical case, 1 large medical case.

These large boxes are similar to our own; they are well supplied with instruments, sterilizer, pans and basins, antiseptics, dressings, splints, hand electric lamps: also with drugs both fluid and tablet form, and a small outfit for the examination of water sufficient for a qualitative analysis only.

The following extracts from a former report of the medical director-general of the imperial navy on the Chinese-Japanese war gives a most clear and excellent idea of the Japanese location of dressing stations, the transportation of wounded, and the care of wounds on battle ships in time of action:

> The surgery of a ship ought to be conveniently placed for collecting the wounded from the various parts of the ship, and also in places least liable to be disturbed by hostile shells. In the men of war of former days, as in the time of Nelson, there was a wide hatch extending vertically from the upper deck to the bottom, and below the water line, which was admirably adapted, being in the center of the ship, for spacious surgery. Nowadays this part is occupied by the engine rooms, coal bunks, etc., leaving no room for the wounded. This difficulty is experienced now in every ship; the surgery must be placed at the fore and aft of the ship and consequently two are necessary, for it would be inconvenient to convey the wounded from one end of the ship to the other, especially so when the water-tight doors were closed, necessitating a very roundabout communication between the fore and aft of the ship. But, as in almost all ships there was no room for surgery at the fore or aft below the water line, therefore places like the lower deck were chosen, which is above the water line and not quite free from the intrusion of hostile shells, so it was the general scheme that two surgeries, one at each end, should be established. But some ships lacking room had to be content with only one surgery.
>
> In the *Matsushima*, two surgeries were established—one on the upper deck of the fore part, and another on the waist of the lower deck. Both were destroyed by shells and the explosion of ammunition; and at this time the chief surgeon of the fleet was seriously injured and some of the wounded persons then receiving treatment were killed. This caused also a great loss of surgical instruments, etc. In the *Yoshino*, one of the surgeries which was placed in the ward room at the rear of the lower deck was twice struck by hostile shells, but luckily no one was injured except a nurse, who sustained a slight wound. We see, therefore, that any part that is above the water line is not free from the danger of being struck by shells, and is, of course, unfitted for a surgery; but, in the absence of room below the line, there is no alternative but to be content with what is obtainable. In order, therefore, to facilitate the conveyance of the wounded and avoid a wholesale catastrophe, it is prudent to have two surgeries; but this division has also its disadvantage, for, dividing the surgeons, nurses, and surgical implements that are anyhow limited in quantity in every ship, affords much inconvenience in treating many wounded men at the same time. In naval battles sometimes 50 or 60 are wounded at one time and in one place. Sup-

posing this should occur in the fore part of a ship, the wounded will naturally be brought to the surgery in that quarter; and the surgery is suddenly overfull and short handed; although only urgent measures of relief are taken in a fight, yet even then it is impossible to pay proper attention to all the wounded. At the same time, the medical attendants in the other surgery may have nothing to do, and yet they are not able to help each other, which is a hindrance to successful treatment.

*Conveyance of the wounded.*—Apparatus for the conveyance of the wounded can no more be uniform in size and construction than ships can. Various kinds had been provided for use on board, one like an easy chair, net hammock, Macdonald's or Gihon's stretchers, etc., and the men had been drilled beforehand in their use. But during the actual engagement it was found that stretchers of all kinds were cumbrous and troublesome and of very little use for the speedy conveyance of a large number of wounded to the surgeries during the noise and confusion of the battle. Hands alone were therefore employed aboard the ships and the stretchers were laid aside. Conveyance by hands alone is prompt and convenient, even if there be many wounded persons at one time; for every man that is uninjured can generally be useful for carrying wounded men; and so during the actual battle our men were obliged to resort to this method. But even then a seriously wounded person requires the assistance of three or four men to get him up or down stairs, and there is always a great deal of confusion in the removal; also, in the conveyance of patients who have sustained fracture or extensive burns, this method certainly aggravates the injury; and from this point of view carrying on stretchers is far the better. We have still a great deal to learn about the conveyance of the wounded on ships, but it is a sine qua non that some handy way like the bare-hand method must be resorted to at the time of the actual engagement, and therefore ship's crews should be also drilled in this method of conveyance.

After the battle, in transferring the wounded from one ship to another, and similar cases, the bare-hand method is not needed, for the wounds have by this time been properly treated, splints and bandages have been applied, and there is time enough to lay the patients comfortably on stretchers. On such occasions field and other stretchers on which the wounded person could lie full length were made use of; the patients were let down by means of pulleys and sent out through hatches or port holes without the slightest hitch.

*Treatment of the wounded.*—In regard to the treatment of the wounded we have already stated that at first only urgent and temporary measures of relief were taken, such as to disinfect the surrounding skin, to extract foreign bodies when they could be easily seen and removed, to staunch hemorrhage by compression or torsion, and in case of a fracture to apply splints. This is inevitable during battle when little individual care can be given to the patients; when the battle was over, proper treatment was accorded in the order of the urgency of the respective wounds. At the time of the second treatment the wounds were again disinfected within and around, any foreign body that was recognized by exploration was removed, splints that were found not to have been properly applied were renewed, and so forth. * * *.

It is true that shell wounds are extremely disposed to suppuration, that the conditions on board ships during action were likely to soil wounds; and besides, the surgeries were all in unsuitable locations. These were unavoidable circumstances, but there are still other points to which further attention should be called. With shell wounds sustained in parts covered by clothes a soiled piece of cloth is frequently found remaining within, and there were not a few cases in which these foreign substances were taken out in the hospital to which the patients were admitted many days after injury. This must have been one of the causes which promoted suppuration, and great care should be taken to examine the wounds well with the finger[a] lest such foreign substances be left behind; for as the inside of the wound is very irregular the cloth pieces can not be washed out by mere irrigation with an antiseptic solution. Again, we have seen that on account of the loss of vital function the wound surface can not resist even a few microorganisms if once admitted. The surrounding tissues should therefore be strictly disinfected, care being taken at the time that the disinfection should cover a larger area than that which is protected by dressing materials. The inside of the wound can not be expected to be perfectly cleansed during the confusion of fighting; so if the quantity required be not so large as to cause poisoning, a solid antiseptic like iodoform may conveniently be sprinkled into the wound.[b] Next, materials for dressing may be preserved with care, but as many days must necessarily elapse before they are actually used, and as their absolute purity can not be assured, there is a need of having on each ship some handy apparatus for disinfecting them immediately before use. It is a fact too well known to need mentioning here that everything that touches the wound should be clean; still it is well to insist on it once for fear it should be neglected in future actions.

---

[a] Note by Director-General Saneyoshi: "At present finger probing is forbidden, especially at time of first aid."

[b] Note by Director-General Saneyoshi: "In such cases we now use boro-salicylic powder."

## TRANSPORTATION.

The Japanese have various methods of transporting their wounded. Some methods have already been mentioned in speaking of hospitals and battle ships. The bamboo stretcher is most commonly used; it consists of two long bamboo poles as handles, with either a canvas body or woven bamboo, as shown in the photographic representation. To keep the handles apart, there is a jointed iron bar at either end that keeps the handles apart when in use, and by breaking the joint allows the stretcher to be folded when not in use. Sometimes these stretchers are made without the bar, and sometimes small iron rests are attached to keep the stretcher from the ground when not being carried; these can be seen in illustration "B."

The stretcher, with canvas and spreading bars, with leg, body, and chest straps, is used to lower or hoist patients from or into a ship; an illustration of this is seen in the hospital ship illustration "A."

When carrying a patient long distances ashore, shoulder straps are attached to the handles and assist the carriers to sustain their burden.

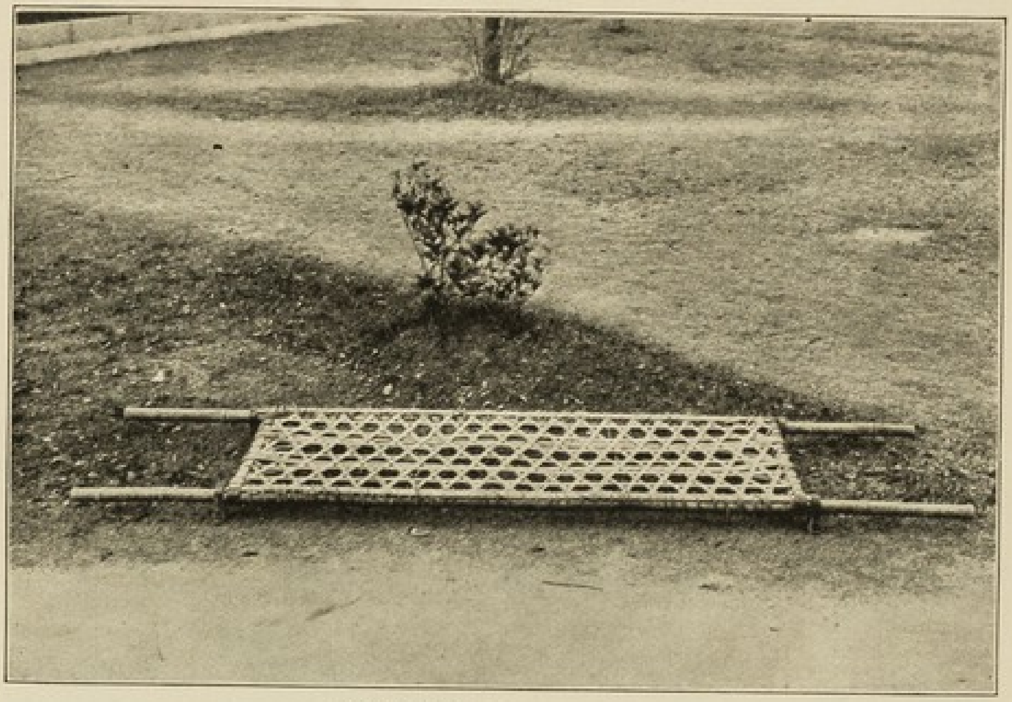
An illustration is given also of the stretcher invented by Surgeon-General Totsuka, of the navy; the diagram attached shows its construction. The stretcher is intended to enfold the patient and is bound around him by the body bands; the cords at the top and bottom are to carry the stretcher by, or a pulley can be used with attached whip and the patient hoisted through a hatch or over the side of a ship, the bamboo splints forming a perfect protection to the patient. The patient can also be dragged along a deck or allowed to slide down a ladder, the bamboo framework on the outside acting as a smooth sliding surface for this purpose. This stretcher is thought very highly of in Japan. Its cost is about $4.

Another interesting transportation apparatus is shown in diagram marked "canvas chair." The construction, as will be seen, forms a canvas seat with sides and back of canvas, with body straps to hold the patient in position and hanging rope drops for the arms and a rope loop for the head; above it has beckets and an eyelet ready to hook in a tackle and whip. This I have seen demonstrated on the battle ship *Chin Yen*. It takes up little if any room when not in use. It is completely ready for hoisting when the patient is seated, and makes a very convenient method of hoisting a patient through hatches or in turrets or over the side of a ship. The explanation of construction will be found in the marginal notes of the diagram.

Patients transferred on shore are usually conveyed on the bamboo stretcher (see photographic series Sasebo No. "39"); usually two carriers only are required. If it rains, or for any reason the patient needs protection, a rubber blanket on small iron supports, forming a sort of roof frame, is used. In the cities in transporting patients the most frequent method of transport for patients able to sit up is the jinrikisha. Long lines of these conveyances are often seen carrying patients from the transport to the hospitals, and they make a very easy and pleasant mode of conveyance.

Ambulances are rarely seen, still they have them, usually two-wheeled carts with a body long enough for the patient to lie down, and an overhanging cover something like the extension top of a carriage. Long handles projecting in front are for the runners to pull them. An ambulance like our standard Navy ambulance would create a great deal of surprise.

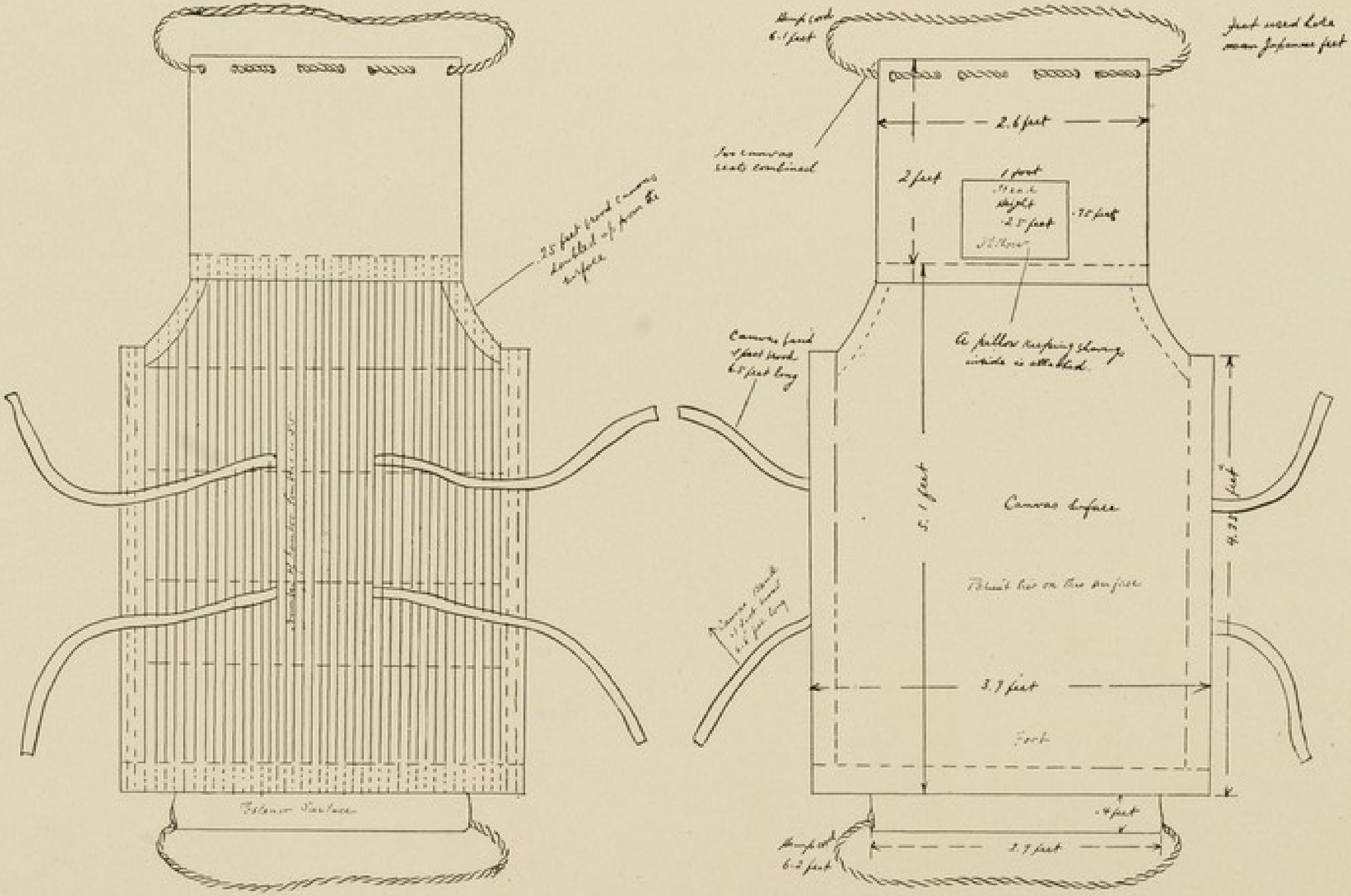
BAMBOO AND CANVAS STRETCHER.



JAPANESE STRETCHER, BAMBOO.

SASEBO, SERIES NO. 34. ADMINISTRATION BUILDING, TRANSPORTATION OF SICK.

TRANSPORTATION HOSPITAL SHIP TO HOSPITAL, SASEBO.



TOTSUKA STRETCHER.

ILLUSTRATIONS SHOWING JAPANESE METHODS OF TRANSPORTATION ABOARD SHIP.

TRANSPORTAT ON HOSPITAL SHIP. BY STRETCHER AND GANGWAY.

SEVERELY WOUNDED ON THE WAY TO A HOSPITAL SHIP.

TRANSPORTATION OF WOUNDED TO HOSPITAL SHIP FROM SHORE.

Transportation in trains is usually in third-class carriages, the patients being able to sit up. Occasionally I have seen a real hospital train made up of third-class carriages, with wooden bunks and attended by nurses, but usually patients are kept at the nearest base hospital until they are able to travel. Sometimes, I understand, that freight cars with straw on the bottom may be used, the patients being laid on the floor of the cars.

Transportation from ships to shore or to hospital ships is accomplished by carrying the patient down the side ladder, as shown in photographic illustration No. 30, by means of whipping them over the side, as described in the article on hospital ships, or in transportation from hospital ships by the use of the cargo ports and small boats or flatboats.

When, for instance, a hospital ship reaches a port like Ujina, she may be met by flatboats, something like a large house boat. This is moved alongside the hospital ship, the cargo ports opened, and the patients easily carried aboard the flatboat. This boat then proceeds to the shore and the patients are transferred to jinrikishas or stretchers and carried to the hospitals. If, however, the patients are to go to one of the divisional hospitals of Hiroshima, as the seventh, the flatboat may carry the patient almost to the hospital door and transfer them in this manner. Where large flatboats can not be obtained, small boats or junks may be used for this transfer to or from the shore.

There is finally the method of transferring the patients by hand, which, as seen in the note of the surgeon-general on transportation of wounded in battle, is usually adopted.

## THE NAVY MEDICAL SCHOOL.

The Navy Medical School was established about thirty-four years ago. It was organized on account of the need for trained medical men of the new schools of medicine, then being introduced into Japan; that is, the European medical culture in place of the old Japanese school, founded largely on the Chinese teaching.

The buildings are situated in the grounds of the war college at Tokyo. There is one principal building of wood, which contains the administration offices, the library, class and lecture rooms, a room for the stowing and demonstration of stretchers and methods of transportation, with other models for teaching purposes, and the X-ray room.

The building is old, but evidently answers its purpose. The library is of fair size and contains a well-selected assortment of medical books, all in Japanese or German. No American professional works were noted. This statement is true of most of the institutions visited, except the medical school in connection with charity hospital, where the library consists largely of American text-books.

In the War College building proper, a large brick structure, rooms are set aside for the use of the medical school. There is a large and well-equipped chemical laboratory, with worktables for 15 students. Here is given a complete course of qualitative and quantitative analysis, with special work in various other lines, such as examination of water, food stuffs, etc.

Another room is set aside for pathology and pathological anatomy. There are worktables for 20 students here, and the fittings are good and complete. There is quite an amount of interesting material, pathological specimens in abundance, both in the cut and the natural state. Material for use here is drawn largely from the charity and university hospitals. A professor from the university attends and teaches in the medical school. Various foreign physicians of well-known fame in Japan have been connected with this school in the past, but the Japanese are fully able to carry on the work and principally from their own corps.

In a separate building, under the charge of Doctor Yabe, of the surgeon-general's office, is the bacteriological laboratory. The building is rather an old wooden structure, but the interior is an extensive and well-equipped laboratory, with every facility for teaching and for experimental work. The war has for the time being closed the institution, as all officers are needed for detail to duty.

It must be remembered that the course of instruction includes, besides the various branches of medicine and pharmacy, instruction in the sciences, and that many medical officers receive their complete medical education in this institution.[a]

I quote from the regulations a translation of the rules governing the Navy Medical College, which may be of interest:

### THE REGULATIONS GOVERNING THE NAVY MEDICAL COLLEGE.

ARTICLE 1. In the Navy Medical College navy surgeons shall be taught in the higher branches of the sciences. At the same time surgeons, probationary assistant surgeons, and probationary assistant apothecaries shall be taught in sciences, and shall be trained in the discharge of their duties, so as to make them competent naval surgeons and apothecaries. In the Navy Medical College sanitary examination of clothing, food, etc., shall be made.

ART. 2. In the Navy Medical College there shall be the following officers: The chief of the college, adjutant, superintendents, professors, chief pay officer.

ART. 3. The chief of the Navy Medical College shall direct the business of the institution under the supervision of the chief of the medical bureau, navy department.

ART. 4. The adjutant shall manage the general affairs of the college under the direction of the chief.

ART. 6. Professors shall undertake to give instruction in various branches of science, under the direction of the chief.

ART. 7. The pay officer shall, under the direction of the chief, manage the business of the accounts and pay.

ART. 8. Besides the officers mentioned in article 2, there shall be in the college clerks and skilled clerks, who shall discharge their duties under the direction of their superior officers.

ART. 9. The naval surgeons, probationary assistant surgeons, and probationary assistant apothecaries who are receiving instruction and training in the medical college shall be called the students of the Navy Medical College.

ART. 10. The students of the Navy Medical College consist of the following three kinds: (1) surgeon students, (2) students of elective courses, (3) probationary assistant surgeons.

ART. 11. Students of elective courses shall be appointed by the minister of marine from among applicants of medical inspectors (holding the relative rank of captain, commander, or lieutenant-commander), and of surgeons (holding the relative rank of senior grade lieutenants of more than three years' standing).

ART. 12. Surgeon students shall be appointed by the minister of marine from among navy surgeons.

ART. 13. All the surgeons, probationary assistant surgeons, and probationary apothecaries shall be appointed by the minister of marine, students in the institution.

ART. 14. The students of the elective course shall prosecute the study of that branch of science they elected.

ART. 15. Certificates shall be given to surgeon students and medical students when they have successfully finished their courses.

---

[a] Note by Director-General Saneyoshi: "Complete? A kind of postgraduate course only; the word 'complete' is misleading."

Art. 16. If the chief of the medical college thinks any of the students to be incapable, he shall report him to the chief of the medical bureau of the department. If the chief of the medical bureau thinks the report to be reasonable, he shall forward it to the minister of marine, who may then order such student to leave the college.

Art. 17. A surgeon student who is promoted to a higher rank while in the college may remain at the college until he shall have finished his course.

Art. 18. In case of war or emergency the minister of marine, if he thinks it necessary, may recall the students of the medical college to duty. The minister of marine may appoint those who are thus recalled to duty as students of the medical college again without conforming to the provisions of these regulations.

Art. 19. The medical college may open an extraordinary course and may summon surgeons and apothecaries on duty to instruct them in some required branch.

## RULES OF THE NAVY MEDICAL COLLEGE.

Article 1. The chief of the Navy Medical College shall frame rules concerning educational affairs and discharge of duties of the officers attached to the college and shall enforce them, with the approval of the chief of the medical bureau of the navy department.

Art. 2. At the end of each collegiate year the chief of the medical college shall inspect the results of the examination and of the investigations made by the students and shall submit them to the chief of the medical bureau of the navy department, with his opinions about them.

Art. 3. At the close of every year the chief of the medical college shall call a council of the professors to discuss the progress that has been attained and improvements to be made, and shall prepare a report on education, which he shall submit to the chief of the medical bureau of the department.

Art. 4. When the chief of the medical college intends to hold the ceremony of granting the diplomas, he shall first receive the approval of the minister of marine to do so.

Art. 5. In final and any other examinations the chief of the college shall select questions from those prepared by the professors.

Art. 6. The chief of the college shall nominate one who shall guide the students of elective courses in the study of the branch they have selected.

Art. 7. The chief shall make sanitary examinations of clothing, food, etc., and shall report the results to the chief of the medical bureau of the department.

Art. 8. The collegiate year of the surgeon students' course and the elective course shall commence on the 10th of January, and that of the medical student course shall begin at the time the students are admitted to the college. The summer vacation is from the 1st to the 31st of August, and the winter vacation from December 21 to January 9. The principal may, however, lengthen, shorten, or otherwise change these terms, if necessary, with the approval of the chief of the medical bureau of the department.

Art. 8. (2) The surgeon student course and the elective course shall be each one year, which may be lengthened or shortened more or less. The course of the medical students who are surgeons shall be six months, and that of the medical students who are probationary assistant surgeons and probationary assistant apothecaries shall be regulated by the regulations governing the training of probationary assistant surgeons and apothecaries.

Art. 9. The surgeon students to be admitted shall not be more than 15, and the elective-course students shall be not more than 5.

Art. 10. Surgeons who desire to become students of elective courses shall select the subjects they intend to study and shall send an application to the minister of marine through the regular channel. On receiving such applications the minister of marine shall order the chief of the medical bureau of the department to see whether the applicants are competent to prosecute the study of the branch they have selected, whether they have learning enough, and whether they are of good conduct.

Art. 11. At the close of the course a student of the elective course shall write the results of his investigation of the branch he has selected and shall submit it to the principal of the college.

Art. 12. Surgeon students and students of the elective course shall attend the college from their own lodgments, but the medical students shall be lodged at the college.

Art. 13. Articles which the students require for the prosecution of study shall be purchased at their own expense, but books, instruments, etc., necessary for study may sometimes be loaned.

Art. 14. When the principal of the medical college thinks it necessary to open an extraordinary course, he shall recommend it to the minister of marine, stating the kinds of surgeons to be taught, the subject, and the term. Surgeons to attend such an extraordinary course shall be detailed by the minister of marine. When such extraordinary course is finished the principal of the college shall report it to the chief of the medical bureau of the department.

The complement of the Navy Medical College is: Principal (surgeon with rank of captain), adjutant (surgeon with rank of lieutenant-commander or lieutenant), 3 superintendents (surgeons, lieutenant-commander or lieutenant), 4 professors (surgeons with rank from captain to lieutenant), chief apothecary (rank of commander), paymaster (rank of lieutenant), 1 clerk, 1 expert clerk.

Besides the above, 2 assistants and 3 writers.

The class of students at our Naval College would correspond to the Japanese probationary surgeon.

It is to be noted that they make provision for 15 surgeons to take the regular course and for 5 surgeons to take the elective course of one year's duration; that these surgeons are of the rank of senior lieutenant, lieutenant-commander, and commander. In other words, they make provision for keeping their older surgeons well up in the medical work of the day. It is to be noted that we have been able to do the same, and our Navy Medical School to-day is one of the most notable features of the present administration.

## REMARKS ON MEDICAL AND SURGICAL CASES SEEN MOSTLY IN ARMY RESERVE HOSPITALS.

The following classes of disease were noted in different places:

In the naval hospitals proper very few cases of special interest were found, and the number of patients was small, many wards being vacant. Most of the patients were convalescents. No operating seemed to be taking place, although some very interesting results of operation were seen. The long period of comparative inactivity of the navy and freedom from actual battle is probably the cause of this. Also the excellent state of health of the navy has undoubtedly caused the paucity of cases found in the hands of the naval hospitals.

1. Typhoid fever is not prevalent. There were seen in all only 12 cases, and these in the army reserve hospitals, mostly of mild type and contracted outside of Japan at various places at the front. The treatment of these cases is symptomatic. They depend on good nursing, diet, and sponging. Strychnia is a favorite tonic. In no place did I see or hear that tubbing or cold baths were in use. On the whole, both army and navy seemed very free from this disease.

2. Typhus fever: A few cases of typhus fever were reported to me on April 15 as being at the Red Cross hospital, Tokyo.[a]

3. Pneumonia: Occasional cases of pneumonia were seen in various hospitals, with many cases of attendant pulmonary troubles, such as acute and chronic bronchitis.

4. Tuberculosis (pulmonary) is quite prevalent and seems to be on the increase, probably due to the hardships of the campaign, exposure, etc. The Japanese strike me as a people who would be particularly liable to consumption whenever their vitality is lowered. They are all trying for a tuberculin treatment in almost every laboratory, but no marked success is reported. The treatment is symptomatic and climatic.[b]

---

[a] Note by Director-General Saneyoshi: "Typhus usually here means typhoid, the true typhus fever being called eruptive or exanthematous typhus, and so surely these were ordinary typhoid fever. After the manner of the Germans here most people do not use the word typhoid, but say simply 'typhus,' or, literally, 'intestinal typhus.'"

[b] Note by Director-General Saneyoshi: "Statistics do not show any larger mortality from tuberculosis here than those in America or Europe. The apparent increase of tubercular cases is due to the more accurate diagnosis in late years."

5. Venereal diseases are quite prevalent, gonorrhea claiming the largest proportion of cases. In the cities and towns it is very common. At nearly every hospital more or less venereal cases are seen. The seaport towns furnish the greatest sources of infection. In the navy venereal diseases are in abeyance, owing to the lack of opportunity for the men to obtain shore leave. Usually venereal diseases form, perhaps, the largest proportion of cases during the year. The Japanese carry out the "compound" system to a certain extent, the women in these compounds being examined once a week and the men are given instruction in the care and prevention of venereal diseases, but they are by no means held in restraint by these measures. Among the laity gonorrhea seems to be looked on lightly and not much attention is paid to it. The profession, however, are fully aware of its results.

6. Smallpox is not prevalent. Only one case was seen and that at the quarantine station at Hiroshima. It was supposed to have been contracted in Korea. Vaccination is carried out so carefully that smallpox is rare in Japan proper, but cases may be brought in from the island of Formosa or from Korea or China. The island of Formosa seems to be a bête noire in the way of disease to Japan, and pest, cholera, smallpox, and malaria are supposed to be more or less endemic there at all times.

7. Several cases of cerebro-spinal meningitis were reported to me as being at the Red Cross hospital, Tokyo, on April 16, the origin of the cases unknown. Spinal puncture was said to be the method of treatment used.

8. Three cases of erysipelas were noted, probably from infected wounds. They were isolated and were being treated with anti-streptococcic serum. These preventive serums are usually obtained from the serum institute. These were not in a naval hospital.

9. Kakke or beriberi: In the army kakke is quite prevalent; in the navy it is not so. There is practically at this time no kakke in the navy. On the other hand, in the army reserve hospitals were seen many cases of kakke. For instance, on April 16 it was reported to me that there were some 340 cases at the Red Cross hospital. At the reserve hospital at Hiroshima I saw some 26 cases and there may have been more. One series of these cases was very interesting, consisting of kakke complicated with malaria, kakke complicated with typhoid fever, kakke complicated with tuberculosis, kakke complicated with acute Bright's disease, kakke complicated with pneumonia.

The charts of these cases were very interesting, and, as in a case of kakke with Bright's disease and œdema, it is easy to see how the kakke might be entirely overlooked. The diagnosis in this case was made by the examination of the urine, the quantity of the albumen, and the character and kind of casts determining the diagnosis.

As kakke is usually without fever it is comparatively easy to diagnose as the disease progresses from the deep-seated pain, the superficial anesthesia, the œdema or atrophy of muscles, loss of reflexes, and the condition of the heart. From an interesting series of pathological specimens at the Tokio Imperial University, of kakke heart, I was enabled to gain a good idea of the condition as it exists in the patient. The kakke heart presents a marked dilitation of the right ventricle, with a flattening of the base of the heart and a change in the apex. While the older surgeons still cling quite tenaciously to the theory that kakke is due to food conditions, notably rice, still there are many who think that the disease is due to some microorganism and the symptoms to be the result of a true toxemia. In this connection I would mention again that at the third divisional hospital at Hiroshima Surgeon-Major Kokubo showed me a growth of micrococcus, "Micrococcus Kokuba," which he feels quite sure is the cause of kakke. He finds it invariably present in the urine, blood, and feces of kakke patients and no other patients.

He also thinks that kakke is without question a toxemia. In this connection I quote on the other side the résumé of an article by Baron Saneyoshi, as follows:

> (1) The only persons who are attacked by kakke in eastern countries are those who use rice for their daily food, and on examination it has been ascertained that the nutritious substance of their diet is generally below the physiological standard, and if the diet be improved so that the various nutritious ingredients do not fall below that standard, kakke will certainly be prevented before it comes to light.
>
> (2) The extirpation of kakke in the Japanese navy since the year 1884 is entirely to be attributed to the improvement in the scale of diet, and no other hygienic improvement has been recognized as having had anything to do with this result.
>
> (3) Instances of kakke prevalence in our country that have been greatly reduced or totally extirpated by the improvement of diet are to be found not only in our navy, but in army barracks and prisons all over the Empire.
>
> (4) It is an indisputable fact that kakke is most frequent in warm or hot seasons. This, we believe, is because, owing to the inertness of the appetite in those seasons, the Japanese are apt to take nothing but plain meals, as "chazuke-meshi," boiled rice with tea. If such be used too often or exclusively the disease will break out in the coldest season just as much as in the hottest.
>
> (5) It is evident that kakke is liable to prevail in crowded places, such as barracks, factories, and prisons. Persons in these places get their food served to them regardless of their own choice of dishes, with a consequent increase in the quantity of rice. They are thus very liable to the disease. Such persons will enjoy immunity from the disease, no matter how low or damp their places of abode may be, if only they are able to make free choice of food.
>
> (6) If we make investigations about instances of kakke prevalence in districts that have not hitherto been visited by it, it will surely be found that the disease has been taken abroad by people who take rice in large quantities.
>
> (7) The increased prevalence of kakke in Japan within the last twenty or thirty years is to be attributed to an increased supply of rice in all districts and also the increase of people boarding in other people's houses. The prevalence of the same disease in Brazil is, we believe, to be accounted for on the same grounds.
>
> (8) The circumstances attending all the prevalences that have come under our knowledge show that kakke can not be regarded as an infectious disease.
>
> (9) Our observations about kakke in Japan and the East show that it has always an inseparable connection with the use of rice in comparatively larger quantities, together with a lack of other nutritious substances, i. e., albuminous and fatty substances. On the other hand, its prevalence in a lunatic asylum in Ireland constrains us to think that the disease may occur without the use of rice.
>
> (10) If we use proper diet, kakke will certainly be prevented at any season in any place. Neglect of dietary precautions will always be followed by an outbreak of this disease.

The treatment of kakke is symptomatic, beginning with free purgation, regulated diet, and heart tonics, diuretics, etc., as may be indicated.

Undoubtedly the change in the Japanese navy ration in 1884 did away with kakke, and the present ration, so nearly approaching our own in quality and quantity, keeps the navy practically free from this dread disease.

Kakke has been to the Japanese in the past what typhoid fever was to our army in the Spanish-American war.

10. Diphtheria: No cases of diphtheria were seen in the military hospitals, but cases were noted in the infectious ward of the Tokyo

hospital. The use of antidiphtheritic serum will be mentioned under preventive medicine.

11. Malaria: Very few cases of malaria were found anywhere. Japan is peculiarly free from malaria, and while it had mosquitos they are not of the type Anopheles and are not supposed to convey the malarial parasite; but in Formosa many cases of malaria occur and also on the mainland.[a]

12. Scurvy: Quite a number of cases of scurvy were noted from time to time. They were all cases received from Port Arthur, some Japanese and some Russians, and the surgeons told me they were undoubtedly due to poor food. These cases presented the characteristic lesions of the mouth, with atrophy of muscles, loss of power, and extensive ecchymosis of the lower limbs. They are all doing well under antiscorbutic treatment.[b]

13. Dysentery: While dysentery is not a specially marked feature of the statistical returns, still it is quite frequently met with—bacillary dysentery. This disease is so common in Japan and the sources of infection from old cases so many that it is not surprising that there should be at least a noticeable number of cases. Most of the cases do well. If the lesion is high up, involving the small intestine, the prognosis is bad. A full description of this disease will be found in the article attached, by Doctor Shiga, the discoverer of the *B. dysenterica*. It will thus be seen that on the whole the Japanese are peculiarly free from disease, especially anything in the nature of epidemic troubles. Undoubtedly this condition is due to their sanitary measures, the supply of nutritives and suitable food, and the rapid transfer of the sick to proper and adequate hospital care.

On the surgical side, the following cases of interest were noted:

1. Gunshot wounds of the spinal cord: Six cases of this kind were seen in one ward. The injuries were of different portions of the cord, with attendant symptoms following the distribution of the nerves. None of these had required spinal operation. Some seemed to be improving rapidly and others gave evidence of more or less permanent paralysis of the parts involved. The treatment was rest and quiet, operative measures tentative.

2. Eye wounds of many interesting varieties were noted in the different hospitals. Some cases of penetrating wounds behind the eyeball had healed, leaving the eyes intact, but with more or less disturbance of vision. Enucleation of one or both eyes happens frequently. At Hiroshima hospital were seen as many as 50 enucleated eyes for gunshot wounds. After the healing of operation very perfect artificial eyes are furnished, and often it is difficult at first glance to notice the absence of the natural eye.

3. Many skull wounds, both penetrating and nonpenetrating, from bullet wounds or from fragments of shell or from explosive bullets, were seen. Some very remarkable results follow injury and loss of brain substance. The Japanese do very excellent brain surgery, and usually get good results.

---

[a] Note by Director-General Saneyoshi: "In summer or fall we get a fair number of cases of malaria, and then there are some anopheles besides a large number of culex in the most parts of Japan, even in Hokkaido."

[b] Note by Director-General Saneyoshi: "Only those Japanese taken and held as prisoners by the Russians developed scurvy."

4. In the navy nearly all the surgical cases are the result of shell wounds, splinters, fragments of bolts, bolt heads, and pieces of steel. The cases differ very materially from those found in the army hospital. The wounds are usually very extensive flesh wounds, with injury to vessels and nerves, with frequent compound fractures of the femur and long bones, and are very prone to suppurate unless the utmost care is taken in cleaning and dressing them. Many cases of fractured femur were seen with very fair results; union generally good, mobility fair, with usually some shortening and some deformity. A number of cases of fractured patella were noted, had been opened and wired, the general result good, unless the knee joint had been involved, when there was a stiff joint. In this connection it is desirable to compare the photographic plates of missiles removed from wounds in the army and the plate of missles, shell fragments, bolt heads, etc., removed from the wounded of the navy.

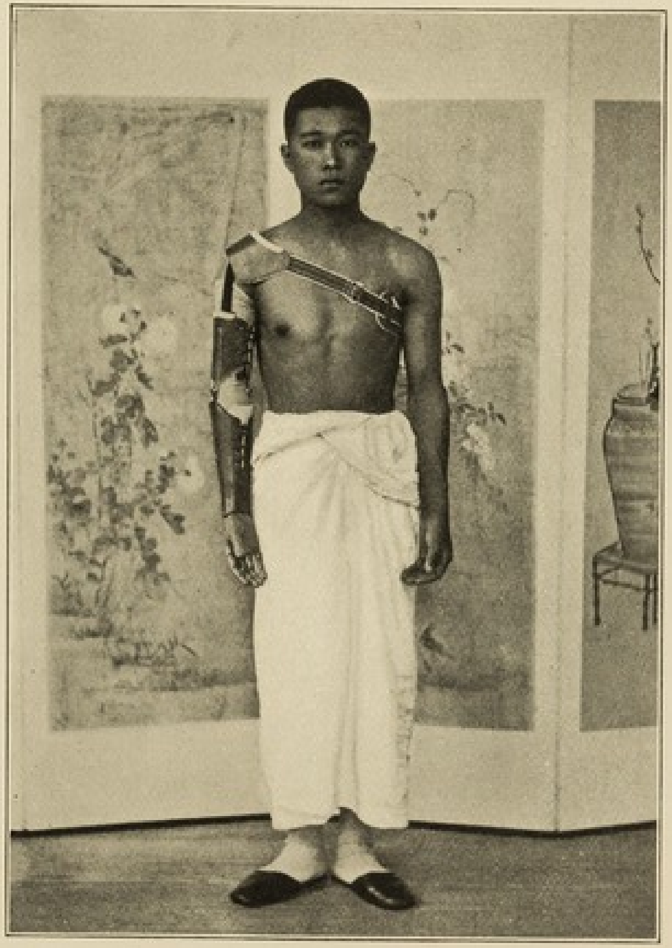
5. Injuries to the nerves were often noted with either absolute loss of function or function disturbed to greater or lesser extent. In many cases resection of injured nerves had been performed and the results varied a great deal. Some cases were totally paralyzed, as far as the muscles supplied by the involved nerves were concerned, and in some cases there was evidence of gradually returning function.

6. Penetrating wounds of the chest from bullets were frequent, and usually do well if let alone, the most frequent cause of trouble being from hemorrhage, if a large blood vessel is involved, or from sepsis if foreign matter is carried into the wounds. On the whole, the cases of sepsis in this variety of wound are quite infrequent. A protective dressing, with rest, is usually all that is needed.

7. Wounds of the face are sometimes quite ghastly, as when the lower jaw is shot away or portions of the nose and upper maxilla. The Japanese are very clever in these cases and do remarkably good plastic surgery. In one case in which the lower jaw was shot away the flaps taken had reproduced a good chin, and an artificial lower jaw of celluloid filled in in such good shape that but little disfigurement resulted, and the jaw and teeth seemed at first glance perfectly natural. Wounds from explosive shells are frequent.

8. Amputations: Few amputations are seen. The Japanese are very conservative in this branch of surgery. However, in a trip through the various hospitals some amputations of feet, legs, the thigh, hands and arms will be noted. The results all seemed good, and the patients are supplied with most excellent artificial members by the generosity of the Empress. The illustrations will show examples of this work, and the patients seemed to use the artificial members with ease and good function in a very short time, as they eagerly demonstrated to me by walking and using the hand and arm.

9. Traumatic aneurism from gunshot wounds is an especially noticeable surgical disability. They occur in all vessels and locations, and particularly in the military hospitals the surgeons are prone to show you many specimens of this kind. Professor Tanaka, at Hiroshima, told me that he had operated on some 110 cases at the hospital. The method consists in dissecting out the aneurism and ligating the vessel above and below, cutting out the intervening portion. The results are generally very satisfactory; the collateral circulation soon establishes itself.



ARTIFICIAL ARM. JAPANESE MANUFACTURE.

ARTIFICIAL LEG. JAPANESE MANUFACTURE.

EXAMPLE JAPANESE ARTIFICIAL LIMB.

10. Appendicitis: But one case of operation for appendicitis was seen in all the stretch of hospitals from Tokyo to Nagasaki. The Japanese think we are daft on the subject of appendicitis and always mention it with a smile. It may be that they are less prone to appendical troubles than we, on account of a lower type of living, or it may be that cases pass unnoticed. The latter hardly seems probable.[a]

11. Many cases of extensive burns occur, especially in the navy. There is nothing special to say concerning these painful wounds. The dressings are usually simple asceptic, nonstimulating dressings. Occasionally a case of keloid is seen, resulting from the scar formation.

12. Frostbites, particularly of the feet and fingers, are very frequent, and many of these are seen in the reserve military hospital; few, if any in the naval hospitals. They occur from exposure to the cold, especially in cases that are wounded and left for a time on the field, and most of them came from the battlefields of Manchuria. Every grade of inflammatory reaction is seen in these cases, from simple ulcerating surfaces to gangrene of different members. Quite a number of amputations are required for this condition.

## PREVENTIVE MEDICINE.

Studies in preventive medicine are carried on, especially at the Institute for Infectious Diseases and the Serum Institute, and quotations given below are taken from the official pamphlet of the work of the institute.

Under this head come such diseases as smallpox, dysentery, typhoid fever, erysipelas, tuberculosis, pest, leprosy, tetanus, venereal diseases, and the eruptive fevers, such as measles, scarlatina, etc.

*Smallpox.*—This disease is not common in Japan at present. Vaccination is general and has proved wonderfully efficacious. In the navy all recruits are immediately vaccinated and revaccinated if necessary. By the navy regulations all persons must be revaccinated every five years. The Japanese manufacture their own vaccine; that made at the vaccine farm at Tokyo, under the management of Doctor Umeno, is perhaps the best. This farm was visited and the entire process of producing the glycerinated lymph was demonstrated to me. The following article, with illustrations, given me by Doctor Umeno, gives a complete description of the process, together with the organization of the farm and will be of interest:

> The buildings on the farm consist of a main building, a stable, a quarantine house, and a few other buildings.
>
> Main building: From the front entrance, on the left are an office, a room for vaccination, and a room for specimens; and on the right are the president's office, a library, and a laboratory. Going straight from the entrance, and the other side of a corridor, are rooms used for making lymph.
>
> In the specimen room are provided for reference over 100 utensils for vaccination, both foreign and Japanese, apparatus necessary for vaccination, specimens of calves, and of tables for vaccinating calves.
>
> In the library are kept about 300 volumes of foreign and Japanese books and magazines on bacteriology, medical science, veterinary science, and animal gynecology.
>
> The laboratory is on the northwest corner of the the main building. All equipments necessary for bacteriological experiment with lymph are here provided.
>
> On the northeast corner of the main building is the vaccination room, where is provided all necessary apparatus.

---

[a] Note by Director-General Saneyoshi: "I fancy Japanese might be even more liable to appendicitis than Europeans or Americans, for our food contains indigestible materials, such as vegetable fibers."

Disinfection room is for disinfecting calves which are to be vaccinated or from which the lymph is to be collected. Here are found disinfecting apparatus and a washing basin.

The room for operating upon calves is on the southwest corner of the main building, amply supplied with necessary utensils and medicines.

The triturating room is on the east side of the disinfection room. Here the collected variolous matter is triturated and diluted. And here there is complete apparatus for collecting, triturating, and diluting the variolous matter and also a large refrigerator for cold storage.

The bottling room is on the north of the triturating room, separated from the main entrance by a corridor. Besides the apparatus for bottling, there is provided an ice chamber, where the lymph for sale is preserved.

To facilitate disinfection the basement of all these rooms is entirely cemented, and every possible care is taken to keep the rooms clean.

Stable: The stable consists of three buildings—Nos. 1, 2, and 3. Both Nos. 1 and 2 will accommodate 30 calves, while No. 3 will hold 28. There is a diagnosis room and a dissection room.

The quarantine station, in which newly purchased calves are kept, is on the west side of the main building and about one hundred yards from stable No. 3. It is large enough to accommodate 28 calves and has attached to it a barn.

*Work.*—Before the work of the institute is described it would be well to refer to the nonhumanized lymph discovered by Mr. Umeno, under the direction of Professor Kitasato. It is a well-known fact among physicians that the humanized lymph, though it is very powerful, is liable to become the medium of conveying germs of other diseases, while on the other hand the retrovaccine is weak in effective power, though the danger of its transmitting other diseases is much less. But the nonhumanized lymph, discovered by this institute, while minimizing the defects of the above two kinds, combines the merits of the two. Hence it can be safely pronounced the best vaccine lymph ever found.

The attempt to make lymph without the medium of the human body has long been tried. The greatest obstacle lay in the fact that if vaccination is continued from calf to calf its effective power would gradually become so weakened that it would finally become noneffective. Physicians used to attribute this to two reasons: (1) That the calf's body weakens the effective power of the lymph; and (2) that animal lymph contains a very small quantity of virus. But according to Umeno's experiment the result is just the other way. The cause was found in the wrong method of inoculation. Its scientific treatment has been minutely recorded in Saiking-Zasshi, No. 66. Its main points are as follows: "The quantity of virus in animal lymph is much greater than in humanized lymph. Unless, therefore, it is diluted before inoculation the very existence of superabundant virus will hinder its growth. The portion of the calf's body inoculated should be small and the vaccine must be carefully nourished, otherwise its effective power will not be preserved."

This theory was proved to be well founded by practical experiment, and this new method of producing lymph without passing through a human body was at last adopted. If, therefore, the lymph is sufficiently diluted and inoculated into the belly of the calf over a small surface, it will continue to produce the same result however often it may go through the calf's body. It is now nearly four years since the introduction of this method in the institute, and the lymph does not deteriorate or lose its power after passing through 130 calves, but rather its effective power has increased.

The following is the method of producing nonhumanized lymph:

Calves: The calves to be used for producing lymph are robust and from 2 to 4 months old. They should be carefully examined for skin and other diseases, and particularly for the existence of tuberculosis by the tuberculin test.

Original lymph: The original lymph used for inoculation ought to be the very strongest, but that which is not mixed with other bacilli. The method of making this lymph differs from the ordinary method in this—that the vaccinated surface is made smaller—that is, the proportion to be inoculated is 3 square centimeters for every 4 kilograms of the calf's weight, and that, in order to sterilize, the lymph to be used ought to be mixed with diluted glycerin containing 1 per cent of carbolic acid in the proportion of one to four.

Method of inoculation: When calves are to be inoculated the hair of the belly is first shaved, the parts thoroughly disinfected with soap and alcohol, and the skin wiped with sterilized cotton, and three or four lengthwise scratches made with the lymph knife (fig. a) invented by Umeno, and over these scratches cross scratches are made. The depth of the scarification differs with the thickness of the skin; but the general rule is to cut not so deep as to draw blood. If too large a quantity of serous fluid should come out it must be carefully wiped off with a piece of cloth and then the lymph rubbed over the scratches. After completing the vaccination the wound is covered with sterilized cotton, on which a cotton wadded cloth is placed, and the calves are led into the stable.

The vaccinated portion of the body will swell up a little and become red on the third day. On the fourth day it will be greatly inflamed and the calf will show signs of uneasiness, with a temperature of 39.5° to 40° C. On the fifth day the temperature will reach as high as 40° to 40.8° C., and the vaccinated part will still be greatly inflamed and exhibit a white tinge on account of the pus and vaccine vesicles, because of thickness of growth will have a flat surface. When it reaches this stage it is the proper time to collect the tissue.

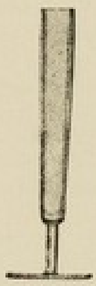
Method of collecting tissue: The inflamed portion is first to be moistened with sterilized water, then washed with soap and 3 per cent carbolic acid solution, rubbed with a piece of cotton, and the moisture carefully wiped off with a piece of sterilized cotton. Then, standing on the left of the calf, which has been placed on its back, the skin is pressed from a little behind the row of the vaccinated portion with a stretcher (fig. c) in the left hand, while with the lymph collector (fig. b) in the right the vaccine vesicles are scratched off from the hinder part toward the front. Then the rows of vaccine vesicles thus scratched off one by one are put into a small dish. When this is all finished a mixture consisting of ten parts of iodoform and ninety parts of charcoal dust is put over the wounds.

Mode of preparation: The tissue thus obtained is weighed and ground by the Doering's lymph-grinding mill. When it is sufficiently ground the carbolic acid glycerin is mixed with the vaccine in the proportion of four to one, the result being five times diluted lymph. A glass tube with a stopper at the bottom is used to remove the spume (fig. d). The spume is easily removed by turning it in a centrifugal apparatus, as it will come up on the surface.

After the removal of the spume the stopper is taken off and the fluid collected. When this is done a perfect lymph is produced. In order to offer it for sale it is put into a lymph tube by a lymph sucker and sealed at both ends. The lymph sucker (fig. e) is a glass tube having a rubber ball at one end and at the other a rubber stopper with a small hole in the center, into which a lymph tube is inserted in order to fill it with lymph. The rubber ball also has a small hole, which is intended to regulate the passage of the air by the motion of a finger placed upon it.

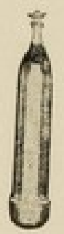
*a*

*b*

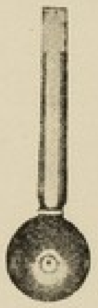


*c*

*d*



*e*



The effect of nonhumanized lymph: Not only does it produce a perfect vaccine vesicle on calves, but it also has a good effect upon the human body. It produces the regular form of vaccine vesicle. The inflammation of the inoculated portion is medium, containing no pus of a bad nature, while internally it is well filled. The whole system exhibits symptoms of illness, with a slight fever of from 38.5° to 40.5° C. The vaccine vesicle will desiccate in the usual number of days. While its effective merit is the same as ordinary lymph, its superiority consists in the total absence of any medium which introduces infectious diseases and of abnormal inflammation. Besides its positive result is always sure. As proof of this it has greatly lessened the figures showing the difference between the number of vaccinated cases and the successful results. It has also considerably increased the number of successful results of the second or third vaccination as well as the first.

When calves are inoculated by intravenous injection, either with humanized lymph or retrovaccine, the number of vaccine vesicles which grow on the body has been very small, only one or two appearing on the face or around the anus. But when nonhumanized lymph is used so very many vaccine vesicles grow not only on the skin, but also upon the mucous membrane, that in one of the animals used as an experiment were found as may as 260 vaccine vesicles. The accompanying figure shows a calf on whose skin numerous vesicles are developed after ten days of intravenous injection of vaccine virus. This fact speaks for itself of the greatness of its effect. Not only is this lymph superior to any of the former kinds, but the expense of producing it has been greatly reduced.

The following is the amount of lymph sold in each of the years named:

| | Tubes. |
|---|---|
| 1899 | 525, 392 |
| 1900 | 442, 860 |
| 1901 | 450, 747 |
| 1902 | 656, 985 |
| 1903 (January to August) | 663, 980 |
| Total | 2, 742, 164 |

The price of one lymph tube, which contains a sufficient quantity for five vaccinations, is 5 sen. But to those who purchase it for charity half the price is charged. About three-fifths of the total amount is sold in this way. For orders from foreign countries, 30 sen per tube is charged.

Dysentery: The dysentery to be considered is the dysentery of Japan, the bacillary dysentery of Shiga. This disease has proved a great scourge in the years gone by, but through the efforts of Doctor Shiga not only has the bacillus been isolated, but a successful mode of inoculation, which gives very interesting results. Concerning this the following extract from the pamphlet of the institute states:

> The dysentery prevailing in Japan and other countries of the temperate region is different from the amæbic dysentery of tropical lands. Its bacillus was discovered in 1897 by Doctor Shiga, and it is generally accepted throughout the world to be the cause of this disease. It is a bacillus resembling that of typhoid fever. Antitoxic serum made out of this bacillus is exceedingly effective for remedial purposes. According to the result obtained by the experiment in 1898 and 1899, there were only 15 deaths out of 165 patients. The rate of mortality was therefore 9.1 per cent. At the Hiro-o hospital, the number of deaths being 11 out of 88 patients, the death rate is 12.5 per cent against 30 or 40 per cent of the ordinary treatment. Not only is the merit of this treatment so apparent in our own institute, it is also tried in various parts of the country with a very satisfactory result. Prophylactic inoculation of dysentery also shows hopeful signs. We use sterilized agar culture as in the case of cholera, and inoculate twice. Its effect on the patient being more violent than in cholera, we inoculate according to Doctor Shiga's method, sterilized bacteria and antitoxic serum, at the rate of 50 per cent in the first instance and the second at the rate of 80 and 20. By so doing the patient can stand the treatment without sustaining a violent effect. We have already tried prophylactic inoculation on 50,000 persons, and the results have been very favorable. In August, 1900, for example, dysentery broke out in a little village, Koai, in Aiko country, in the prefecture of Kanagawa, and 28 persons fell sick in the course of a month, whereupon all persons in the village above 4 years of age were required to be inoculated. The result was almost miraculous. With the exception of two persons only, who contracted this disease on the day after the first inoculation, all escaped the grasp of this dreadful contagion.

The following table gives an idea of the extent of this disease in Japan, and the mortality in the absence of the treatment of Doctor Shiga:

| Year. | Number of cases. | Per cent of deaths. | Number of deaths. |
|---|---|---|---|
| 1890 | 42, 633 | 20. 4 | 8, 706 |
| 1891 | 46, 358 | 24. 2 | 11, 208 |
| 1892 | 70, 824 | 23. 7 | 16, 844 |
| 1893 | 167, 305 | 24. 7 | 41, 282 |
| 1894 | 155, 124 | 24. 5 | 38, 089 |
| 1895 | 52, 711 | 24. 5 | 12, 959 |
| 1896 | 85, 876 | 26. 0 | 22, 356 |
| 1897 | 91, 077 | 25. 4 | 23, 189 |
| 1898 | 90, 976 | 24. 6 | 22, 392 |
| 1899 | 108, 713 | 22. 8 | 23, 763 |
| 1900 | 46, 236 | 22. 1 | 10, 265 |
| Total | 875, 534 | 26. 29 | 231, 064 |

Typhoid fever: Besides the ordinary prophylactic measures taken to prevent the disease, the products of the bacillus of typhoid fever may be inoculated or antitoxic serum used.

> According to the experiments lately tried by using the latter method, it has been found to be a decided improvement on the old method. Only 36 persons died out of 203 patients in our hospital, viz, the rate of mortality is 17.7 per cent. When typhoid fever prevailed in various districts, complete success was obtained in checking its wide spread by means of prophylactic inoculation.

Tuberculosis is quite prevalent. The Japanese navy regulations are very specific on the immediate isolation of these cases and give minute directions to surgeons to be on the outlook for them. At the hospitals isolation is the rule. At Maizuru the tubercular cases are isolated in the contagious disease wards. Concerning this the institute pamphlet states:

> The remedy and prevention of this disease is one of the principal subjects which we are most earnestly investigating. It is, however, a great source of mortification that in spite of our effort in experimenting with Koch's original tuberculin, new tuberculin and the newest tuberculin, which we made in our institute, we have not yet met complete success. For diagnosis and particularly in the case of bovine tuberculosis, original tuberculin is largely used. Other topics for our careful experiment at present are the difference between the bovine and human tuberculosis, the merit and demerit of antitoxic serum, and the effect of prophylactic inoculation.

Erysipelas: "By inoculating the sterilized bouillon culture of erysipelatous streptococcus around the inflamed portion, we have obtained a very successful result in dealing with this disease."

Pest or plague: No cases of plague have been found, and I have heard of none in Japan. At many places, such as the Army Medical School, rats were being examined and a careful watch is kept for this disease. A pest serum and vaccine is manufactured at the serum institute described as follows:

> The bacillus is cultivated in a slanting tube of agar for forty-eight hours within an incubator at a temperature of 32° C., and it is mixed in the physiological salt solution as emulsion and sterilized by heating for thirty minutes in a water bath of 60° C. Using this the horse is immunized by subcutaneous injection.
>
> 0.1 to 0.05 cubic centimeter of serum obtained from this immunized horse is strong enough to entirely destroy $\frac{1}{100}$th part of one platinum loop of very virulent pest bacillus, $\frac{1}{100000000}$ of one platinum loop of which can kill a white mouse 12 grams in weight.

In the year 1901 this serum was examined in Tainan isolating hospital (Formosa), adopting the so-called alternative method—i. e., the odd numbers of cases were injected with serum only, the even numbers receiving no injections, but early extirpation of buboes and general systematic treatment. The results of this examination were as follows:

| | Serum treatment. | | Nonserum treatment. | |
|---|---|---|---|---|
| | Number. | Per cent. | Number. | Per cent. |
| Number of cases | 56 | .......... | 56 | .......... |
| Cured | 37 | 66.07 | 21 | 37.5 |
| Died | 19 | 33.93 | 35 | 62.5 |

NOTE.—The death rate of nonserum treatment of plague in the same hospital from 1898 to 1900 was 54.04 to 60.48 per cent.

By this method of serum treatment the death rate is therefore very low, showing a great improvement over any other.

The following is the amount of serum either sold or freely distributed in each of the following years:

| | Bottles |
|---|---|
| 1900 | 370 |
| 1901 | 830 |
| 1902 | 1,309 |
| 1903 (January–August) | 1,268 |
| Total | 3,777 |

One bottle contains 40 cubic centimeters.

The method of producing pest vaccine is not different from that of making the above-mentioned material used for immunizing horses. Only in this case 6 milligrams of pest bacillus are mixed in 1 cubic centimeter or 0.8 per cent salt solution containing 0.5 per cent carbolic acid. The quantity of the vaccine to be used differs with age. In the first instance of inoculation, 0.5 to 1 cubic centimeter, and in the second, 1.0 to 3 cubic centimeters is injected under the skin. The number of persons who received this treatment in Formosa and Osaka is no less than 200,000. It was very rare for persons who received this treatment to contract the disease. This should be reckoned, therefore, as good a preventive measure against this contagion as the destruction of rats.

The following shows the amount of pest vaccine both sold and distributed in the following years:

| | Bottles. |
|---|---|
| 1900 | 3,232 |
| 1901 | 5,288 |
| 1902 | 2,135 |
| 1903 (January–August) | 3,925 |

One bottle contains 40 cubic centimeters.

Cholera: Extensive epidemics of cholera have prevailed in Japan in the past. Improved hygiene and the use of cholera vaccine is thought to have materially reduced the number of cases in late epidemics. Concerning the serum and vaccine the official pamphlet says:

> When cholera prevailed last year serum and vaccine were made for curative and preventive purposes.
>
> The amount prepared and distributed last year is as follows:

| | Bottles. |
|---|---|
| Cholera serum | 1,958 |
| Cholera vaccine | 56,554 |

One bottle contains 40 cubic centimeters.

The above two kinds of serum were given to patients without charge.

The method of preparing the above-mentioned serum is as follows: The bouillon culture of cholera bacillus is sterilized by heating for thirty minutes at 60° C. Using this a horse is immunized through intravenous or subcutaneous injection. The "title" of the serum obtained from the immunized animal, adopting Pfeiffer's method of test, is equal to one-tenth to one-thirtieth milligram.

The following figures show the result of the serum treatment upon patients during last year:

| | |
|---|---|
| Total number of patients who received this treatment | 538 |
| Deaths | 274 |
| Cured | 264 |

The death rate is therefore 50.93 per cent. This is a great improvement over other treatment.

Cholera vaccine is obtained by scratching off the agar culture of cholera bacillus, heating it for thirty minutes at a temperature of 60° C., and then adding 0.5 per cent of carbolic acid. Its 1 cubic centimeter contains the bacillus of 3 myriagrams. The mode of inoculation is to use 1 gram by means of subcutaneous injection just once. The patients who receive this treatment feel no serious pain, excepting only a slight fever and a little weariness. So many persons have been inoculated that it would be almost impossible to collect exact statistics. But this treatment has undoubtedly lessened the number who would otherwise have become the victims of this disease.

Leprosy: No satisfactory method of dealing with leprosy has yet been found. Concerning this the official pamphlet states:

> This disease not being uncommon in our country, demands our most careful study. There is a Christian charity hospital in the suburb of Tokyo, called Meguro, with thirty to forty inmates, and its medical treatment is intrusted to our care. The cause of this disease has already been discovered by Dr. Armauer Hansen, but no satisfactory method has yet been found for its culture, or have animal experiments proved successful. It is, therefore, one of the subjects of our careful investigation.

Tetanus: Inoculation is used for this disease of either a liquid or solidified tetanus serum.

> There are two kinds, liquid and solidified. The former contains ten immune units in 1 cubic centimeter, while the latter contains from eighty to one hundred immune units in 1 gram. The immune unit is in accordance with Behring's system. The kind and price are as follows:

| | Quantity. | Immune units. | Price. |
|---|---|---|---|
| Liquid serum: | | | *Yen.* |
| Bottle No. 1 . . . . . . . . cubic centimeters . . | 10 | 100 | 0.60 |
| Bottle No. 2 . . . . . . . . do . . . . | 40 | 400 | 2.50 |
| Solidified serum . . . . . . . . grams . . | 10–13 | 1,000 | 6.50 |

Bottle No. 1 is used for prophylactic treatment, either when wounds show signs of tetanus or when a surgical operation has been performed. It is to be injected under the skin around the wound. One cubic centimeter is to be used at one time. One bottle, therefore, contains sufficient quantity for ten injections. This is now widely used for wounds of horses or after castration. Bottle No. 2 is the prescribed quantity for curing one patient.

Diphtheria: The number of cases of diphtheria in 1899 was 21,035. The use of the serum treatment, which is now becoming general, has reduced this very much. In 1902 there were but 15,005, with 4,314 deaths. It will be remembered that the serum treatment of this disease was discovered jointly by Professor Kitasato and Behring in 1892.

> The first instance of applying the serum for inoculation, prepared at the institute, to the patient was in November, 1894. From that time until August 31, 1903, it had been tried on 4,556 persons, out of whom only 480 died—that is, the rate of mortality was 10.5 per cent. Thus the favorable results shown in the statistics of the world are confirmed by the experiments of the institute. Previous to the sale of serum the death rate of diphtheria patients was 50 per cent per year; but since sale began it has gradually decreased to 38 per cent in 1896, 36 per cent in 1897, and, finally, as low as 28 per cent in 1902

Venereal diseases: These diseases, which constitute so large a factor in the usual statistics, are somewhat in abeyance at this time, owing to the few opportunities the enlisted force has for shore leave. The preventive measures taken by the Japanese are:

1. Careful instruction of the enlisted man in regard to cleanliness and the use of prophylactics.
2. Monthly examinations and restriction.
3. Loss of opportunity of promotion if diseased.
4. Establishment of compounds at the various naval bases, with the weekly examination of women.
5. Some of the ships are said to supply the enlisted men with rubber protectors when they go ashore. A dozen being given to each man, and they are instructed to use them if necessary.
6. At the serum institute efforts are being made to find a prophylactive and curative serum, but these efforts have not as yet met with much success.

Measures taken to prevent and control the various other contagious diseases follow in the extracts made from the navy medical regulations of the Imperial Japanese navy.

The following translated extracts are from the regulations of the Imperial Japanese navy:

### PRECAUTIONS AGAINST CONTAGIOUS DISEASES.

ART. XXIX. A chief surgeon, when a case of contagious disease occurs in a vessel or at a shore station where he is on duty, shall report it to the commanding officer, and shall transfer the patient to the naval or any other hospital, and when necessary shall separate from others those who have been near the patient.

ART. XXX. In the above case the chief surgeon shall prepare a report of the appearance of contagious disease and shall forward it to the chief surgeon of the naval station. He shall also prepare and forward reports of the state of the disease. In case he receives a report of a case of contagious disease after a patient has been transferred to the naval or any other hospital he shall report the state of the disease without delay. In case of a vessel lying outside the naval port, or of a shore station lying in a distant district, the report of the appearance of a case of contagious disease shall be sent at the same time to the chief of the medical bureau of the navy department.

ART. XXXI. In case a contagious disease prevails in a vessel or at a shore station the chief surgeon shall forward to the chief surgeon of the naval station concerned a daily report; and after suppression of such disease he shall submit a minute report concerning the number of the cases from the beginning, number of recoveries, source of contagion, method of propagation, and measures taken for disinfection and prevention of the disease, etc. In case this report is submitted the reports concerning the appearance of a case of contagious disease and of the state of the disease may be dispensed with.

ART. XXXI–2. In case a large number of cases occur simultaneously on account of a disease of contagious or epidemic nature, or from poisonous food or drink, the chief surgeon shall report the state of the disease to the chief surgeon of the naval station concerned without delay. In a vessel lying outside a naval port or at a shore station in a distant locality such report shall be made to the chief of the medical bureau of the department also. In case a vessel which is attached to a squadron lies in a naval port, or a vessel of a naval station lies at another naval station, the reports of the preceding two articles and of the first clause of this article shall be also made to the chief surgeon of the naval station where the vessel is staying.

ART. XXXII. When a case of contagious disease occurs in a vessel while at sea, the chief surgeon shall, if the case requires it, inclose a space with canvas in the fore deck or in any other suitable locality, and shall transfer the patient there, at the same time prohibiting all communication with the rest of the crew.

ART. XXXIII. The chief surgeon shall disinfect the body and clothing and all other things carried by those who are suspected of being infected, and shall separate them from the rest for a certain number of days.

ART. XXXIV. The chief surgeon shall make those who have recovered from a contagious disease, or those who have been freed from the restriction of separation, wash their bodies with soap and water and then take an ordinary bath.

Art. XXXV. The water of a bath tub in which an infected person took a bath, or the water with which soiled things of an infected person were washed, shall be thrown away after mixing with it chloride of mercury and table salt at the rate of 2 parts for every 1,000 and after leaving it for one hour.

Art. XXXVI. The chief surgeon shall dispose of excreta and soiled things of an infected person as follows:

1. Excreta and soiled things of an infected person shall be carried in an empty cask that does not leak or in a tin can, with disinfectant added, to be covered with a lid.

2. Excreta and soiled things of infected persons shall be burned or buried only at a place settled for the purpose.

Art. XXXVII. The chief surgeon shall dispose of the corpse of an infected person as follows:

1. The corpse of an infected person shall be wrapped with a blanket steeped in a solution of carbolic acid or of chloride of mercury, and shall be sprinkled with the same solution from time to time.

2. The coffin for the corpse of an infected person shall be carefully guarded against leak or the escape of any fluid by coating all the seams with tar and spreading a blanket on the bottom.

3. In case of cholera, dysentery, or typhoid fever, a piece of cotton steeped in a solution of carbolic acid or chloride of mercury shall be put at the anus of the corpse.

4. The corpse of an infected person shall be cremated at a selected place, and in case a death occurs at sea the corpse may be cast into the sea, attaching to it shell or ballast weighing about 80 pounds.

Art. XXXVIII. The chief surgeon shall take steps to suppress a contagious disease, using the folowing methods:

1. Burning method: This is the most effective of disinfecting methods, and consequently all infected things other than excreta and valuables shall, as far as practicable, be disposed of by this method.

2. Disinfection with steam: A special apparatus (in a vessel a bath tub which shall be made air tight and steam introduced into it raising the temperature to over 100° C., may be used for disinfecting) is used in which soiled things shall be exposed to steam of over 100° C. for from one to one and one-half hours. In disinfecting clothing, bags, etc., by this method they shall be loosely placed in the disinfector, so that every part of them shall be easily exposed to the steam.

3. Disinfection by boiling: Soiled things are put into a pan, which is then covered with a lid and boiled for from 30 minutes to 1 hour. The boiled things are then washed with clean water.

4. Disinfection with medicals: The following medicals are used for the purpose:

Solution of chloride of mercury: Two parts of chloride of mercury dissolved in 1,000 parts of water to which table salt has been added.

Solution of carbolic acid: One part of carbolic acid dissolved in 20 parts of water.

Milk of lime: Mixture of 1 part of quicklime with 10 parts of water.

5. Disinfection by drying: Rooms or utensils are exposed to the sun's rays or to heat.

Art. XXXIX. In disinfecting cabins or the interior of a vessel the chief surgeon shall adopt the following methods:

1. Before taking measures for disinfection a solution of carbolic acid must be sprinkled with a watering pot to keep down dust.

2. To disinfect ceilings, walls, decks, etc., they shall be washed with solution of carbolic acid (and the solution must be poured into crevices), and must be exposed to the air to dry. Or the milk of quicklime may be spread over and washed off with water after two or three hours.

3. To disinfect a tank, all the water must be thrown away, and, if necessary, the tank[a] shall be disinfected by steam.

4. If there is a suspicion that bilge water is infected, it must be thrown away (if possible outside of any port), and after washing with sea water the bottom of the vessel must be filled with thin milk of quicklime, which shall be thrown away after two or three hours. In case compartments are sufficiently separated from one another, only that compartment which is suspected of infection shall be disinfected.

Art. XL. In disinfecting clothing, utensils, etc., the chief surgeon shall adopt the following methods:

1. Clothing, hammocks, bags, carpets, curtains, etc., shall be disinfected by heating or by boiling after sprinkling the solution of carbolic acid over them.

2. Bedsteads and other articles made of wood shall be disinfected according to the subheading No. 2 of the preceding article.

---

[a] Note by medical director-general: "We now use Yonezawa's high pressure spray apparatus, and by pumping, give a good splash to ceilings, etc. Concerning the disinfection of tanks, we are now trying to boil the water in situ by steam, the tank being half filled"

3. Eating and mouth-washing utensils shall be disinfected by boiling.

4. Metal utensils and tools shall be disinfected by boiling or by washing with carbolic acid.

5. Books and paper shall be disinfected by heating or by drying.

6. Leather articles shall be disinfected by washing with carbolic acid.

7. Receivers of excreta and phlegm shall be washed with a solution of carbolic acid or of chloride of mercury, but if made of metal the latter solution must not be used.

8. Boats, stretchers, etc., used for transporting the sick shall be disinfected with a solution of carbolic acid or with milk of quicklime. Canvas of stretchers and such materials shall be burned or disinfected by heat.

9. Undershirts, towels, etc., shall, if possible, be burned.

Art. XLI. In case of cholera the chief surgeon shall adopt the following methods of disinfecting:

1. A vessel for receiving matters vomited shall be waterproof and shall be filled with a quantity of the solution of carbolic acid or with milk of quicklime. Every time vomited matter is received the solution of carbolic acid or milk of quicklime of equal bulk shall be put in, and after stirring the contents well shall be removed to another receptacle set aside for the purpose, and then it shall be transferred to a place selected for such purpose.

2. In disinfecting a water-closet in a vessel every part of it shall be washed with the solution of carbolic acid, and on shore, besides washing every part, milk of quicklime shall be poured into the receptacle at a rate of not less than 10 parts to 100 parts of the excreta contained in it. Then after stirring well the contents shall be taken out. Then milk of quicklime or solution of carbolic acid shall be sprinkled into and around the receptacle. The contents of the receptacle may be taken out in 2 or 3 hours after mixing milk of quicklime, but it must not be used as manure for one week. After disinfecting the water-closet may be used immediately.

3. Disinfection of cabins, decks, etc., shall be made according to Article XXXIX.

4. Disinfection of clothing, utensils, etc., shall be done according to Article XL.

Art. XLII. In case there is a case of smallpox, diphtheria, eruptive typhus, pest, measles, relapsing fever, or scarlet fever, the chief surgeon shall take the following measures of disinfection:

1. In the patient's ward a vessel containing the solution of carbolic acid shall be kept to receive cotton, paper, cloth, etc., with which scabs, pus, phlegm, tears, mucus of the nose, etc., have been wiped, and these shall be burned.

2. Cabins, decks, etc., shall be disinfected according to Article XXXIX.

3. Clothing, utensils, etc., which are suspected of being infected shall be disinfected according to Article XL.

Art. XLIII. When there is a case of typhoid fever or dysentery, the chief surgeon shall take the following measures of disinfection:

1. Excreta shall be disinfected as in the case of cholera.

2. Clothing, utensils, etc., which are suspected of being infected shall be disinfected according to Article XL.

3. Houses, cabins, decks, etc., shall be disinfected by the drying method, but the part suspected of being soiled with excreta shall be disinfected according to Article XXXIX, subheading 2.

Art. XLIV. The phlegm of patients who are suspected of consumption shall be disinfected with a solution of carbolic acid and shall be deposited at a place suited for the purpose. The clothing, utensils, etc., used by such patients shall be carefully separated from those used by the healthy, and after they are used they shall be disinfected.

Art. XLV. The chief surgeon shall vaccinate recruits (number of punctures at least four) at the time of their enlistment, and every year in November (generally the second Tuesday) he shall vaccinate those who have passed five years or more since their last vaccination and shall enter the result in the medical journal. He shall also prepare a table showing the result of vaccinations and shall submit it to the chief surgeon of the naval station concerned. Those who will pass the five-year limit while at sea shall be revaccinated before they set out on the voyage.

## QUARANTINE.

The Japanese have a number of large quarantine stations. Those at Hiroshima, Moji, and Nagasaki were visited and were of extreme interest. A short description of the Hiroshima station will be given. This station was first established during the Chinese-Japanese war, and has been rehabilitated and added to during the present war. It is situated on an island across the bay from Hiroshima and Ujina.

Many of the Russian prisoners are incarcerated here. To date 32,000 Russian prisoners have passed through this station, received from 67 transports.

All the stations are on much the same plan, although the one at Hiroshima has more modern equipment and is more recently established.

No persons suffering from infectious diseases are brought to the quarantine station proper, but are taken to an isolation hospital first until recovered from their disease, and then brought to the station proper for disinfection.

The mode of procedure is to land the suspected personnel from a ship. They are then taken to reception quarters, where they deliver their valuables, receiving a check for them. They then deposit their clothing in conveyance baskets, are given a thorough bath, scrubbed and cleaned. They are given a kimono and slippers, and then proceed to waiting quarters and remain there until their clothes, valuables, etc., have been disinfected. These are then returned to them and they are taken to a retention house to wait 5 to 10 or more days, as the incubation period of the disease may require. The disinfection of clothing is in the main carried on in large autoclaves by steam at a pressure of 15 pounds in the inner jacket and a temperature of 110° C. The temperature is sufficient to kill anthrax spores in thirty minutes.

The clothing is first deposited in compartments for infected things; is then loaded into small hand carts with woven wire receptacles. The goods to be disinfected by formalin, sulphur, or other chemicals are sent to the rooms prepared for this purpose, and the clothing for steam disinfection is shunted to the receiving doors of the autoclave on the side of the infected compartments. The cars and clothing are then run on tracks into the autoclaves and the doors closed and the steam turned on. When the proper temperature is reached an electric automatic thermometer rings a bell, and from this event the sterilization is timed; usually thirty minutes is sufficient. After this time the clothes are taken out of the other end of the autoclave in noninfected compartments and conveyed after drying to the dressing rooms and restored to the owners on presentation of their tags.

All leather and rubber goods are disinfected at Hiroshima by formaldehyde, but at the other stations only solutions of carbolic acid 20 per cent in the form of a wash or spray is used.

The formaldehyde disinfecting rooms are all lined with tar paper and are of about 750 cubic feet each. One thousand eight hundred grams of formalin are used. They have a special apparatus for atomizing and blowing the gas into the rooms by the use of a steam jet blowing over the formalin in solution. After the disinfection is complete ammonia gas is introduced into the chamber to counteract the formaldehyde gas and enable the workers to enter the chamber. They have also a special portable spray apparatus, known as Yonezawa's portable spray apparatus, manufactured in Tokyo for use on ships and other places.

The baths are very large Japanese wooden baths where 60 persons can be tubbed and scrubbed at once with hot and cold fresh and salt water. The original idea was to give a salt bath first and follow it by a fresh bath, but the idea was not carried into use.

They have enormous tanks for heating hot water, holding 5 tons each, and these can be heated in ten minutes.

For officers or persons of the upper classes they have special baths, and even a special private bath for a high ranking officer.

They have four large autoclaves about 15 by 6 feet. They have a very large engine plant with 6 boilers, 3 for furnishing steam for disinfecting and for furnishing hot water for baths, and 3 for electric lighting. There is a large dynamo room.

Beyond the disinfection plant are the detention barracks. They are fitted up quite comfortably in Japanese style. At Nagasaki for first and second class passengers they had a very fine building fitted in foreign style with nice rooms, carpeted, bureaus, and good bedsteads. Usually some provision of this kind is made for the higher classes, and special accommodation is made for those who are feeble and weak. At Hiroshima the detention pavilions have a capacity of about 1,500.

For quarantinable diseases there are five large pavilions of a capacity of 400, which would be used as a hospital if needed. At present they are occupied by Russian prisoners, as there has been no special use for them for quarantine purposes.

On an elevation above these pavilions there are buildings on the pavilion system for 200 convalescents, but at present used for typhoid and dysentery cases. Here I saw one case of smallpox, the only one noted anywhere, and said to have been contracted in Korea. There was a large dead house, a good-sized garbage burner, and a crematory with a capacity of six chambers, with the accompanying furnaces. Cremation is making rapid progress in Japan, and in the large cities this method of disposing of the dead is much favored. Complete combustion of the body requires two hours and the cost of a single cremation is only 50 sen (25 cents). There are special kitchens for the infectious pavilion, and the food was examined and seemed excellent.

The Russian prisoners seemed in most excellent health and good spirits, and the dinner being served at the time consisted of soup, rice, meat, and most excellent wheaten bread. Papers, money, letters, etc., are disinfected simply by carbolic spray. The organization of these institutions is good.

At Nagasaki last year there were 200 cases of cholera among Chinese. The *Sherman*, of our own service, they told me, had been disinfected and 100 people quarantined for cholera, there being 3 deaths and 4 recoveries, or 7 cases in all.

### THE RED CROSS NURSE.

Probably the most important adjunct to the military services, the army more so than the navy, is the Red Cross nurse. Special attention has been paid to this branch of the service, as there has been more or less agitation of the subject of female nurses in our own service. In the Japanese navy details of these nurses are found in some hospitals, but they are not found on the naval hospital ships, and the surgeons with whom I have talked on the subject did not seem to think they were necessary or desirable there. In time of war they do seem able to be of great use in the hospitals. In Japan the rules of the organization are very distinct in stating that

SASEBO NAVAL HOSPITAL, SERIES NO. 32. TRAINED FEMALE NURSES AT WORK.

these nurses when coming into the service of the hospitals or on the field must give unhesitating compliance to the military medical authority, and to this end these nurses are at times given special instruction looking to their employment in the services.

After the most careful questioning and from observation one feels that the moral character of these nurses is above reproach. They are carefully selected from strong and healthy girls of good character and education. The idea of the importance of their duty and a high sense of their calling is impressed on them from the beginning of their career. They are usually between the ages of 18 and 30, and before undertaking their instruction as nurses are examined in reading, writing, composition, and arithmetic. Their training as nurses covers a period of three years, divided into periods of eighteen months each. During the first they devote themselves to technical and theoretical subjects; during the second period they devote themselves to practical work and the application of the principles taught in the first period. They receive about 7 yen ($3.50) per month, and in war service such compensation as may be determined upon. They are scrupulously neat, dignified, alert, intelligent, and absolutely to be depended upon.

The interest taken in the society by ladies of high rank, who supervise and take an actual working interest in the society, has done much to put the organization on an especially high plane.

Any misconduct, ill health, or lack of mental capacity is sufficient cause for dismissal.

The organization has branches in every province of Japan, and the result is that the Japanese are never in want of any number of excellent nurses.

A great deal has been said about the relation of the sexes in Japan in this connection. It is true that these relations are quite different from ours, but the women of Japan are probably quite as human as women all the world over, and their specially high morality in this connection is undoubtedly due to their patriotism and the principles inculcated from the beginning of the organization of the society.

In the naval hospitals great care and judgment is used. The nurses do not live in the hospital, but outside. They are on duty always in couples, so that one may have the moral and physical support of the other, and in ways like this they are assisted to avoid even the suspicion of evil.

In the organization of the Red Cross Society we have something worthy of imitation, but it must be remembered that Japanese women are very different from American women.

The Japanese woman has occupied so long a position so subordinate and has been trained to an idea of obedience so absolute that they are specially fitted for service in military establishments. It would be almost impossible to expect the same spirit to be shown by our countrywomen, except by years of most careful instruction and discipline.

The skilled, well-trained, and thoroughly experienced American nurse has no superior, but to attempt to organize twenty or thirty thousand reserves from all quarters of the United States would be a great undertaking. However, I think the effort would be worth making.

## THE FIRST DAYS AT SASEBO AFTER THE NAVAL BATTLE OF TSUSHIMA STRAITS, MAY 27–30, 1905.

[With description of work in naval hospital, an account of the work on the ships *Mikasa* and *Izumo*, and of the naval hospital ship *Kobe Maru*.]

On the evening of May 27 an intimation was received that a great naval battle between the Japanese forces under Admiral Togo and the Russian combined fleet under Admiral Rohjestvensky was imminent. I immediately proceeded to the surgeon-general of the Japanese navy and to the American minister, Mr. Griscom, to ask them to obtain permission for me to visit the Sasebo naval station, judging that after battle the ships with the wounded would most likely put in there. Permission was received on the afternoon of the 28th, and on the evening of this day, in company with Inspector-General Kimura of the navy, I started for Sasebo.

We arrived in Sasebo on the 30th of May and found the harbor empty, but in a short time word was brought that the fleet was entering port. Doctor Kimura was very kind on the entire trip and did everything he could to enable me to see the ships, the wounded, and the hospital. I can never forget his kindly interest, and to him I owe largely the opportunity of being the first on the spot and the privilege of meeting so many of the officers of the fleet and gaining such information as I am about to detail.

On learning of the approach of the fleet we immediately went to the naval station and to the hospital. Already on our arrival at the hospital the wounded began to come in and soon one ward was filled with the Japanese wounded, long lines of stretchers and bearers carrying the wounded from the dock to the hospital, a distance of about half a mile. In describing the work I shall take up—

First. The work in the hospital.

Second. The conditions noted on the flagships *Mikasa* and *Izuma*.

Third. The work on the *Kobe Maru*, hospital ship.

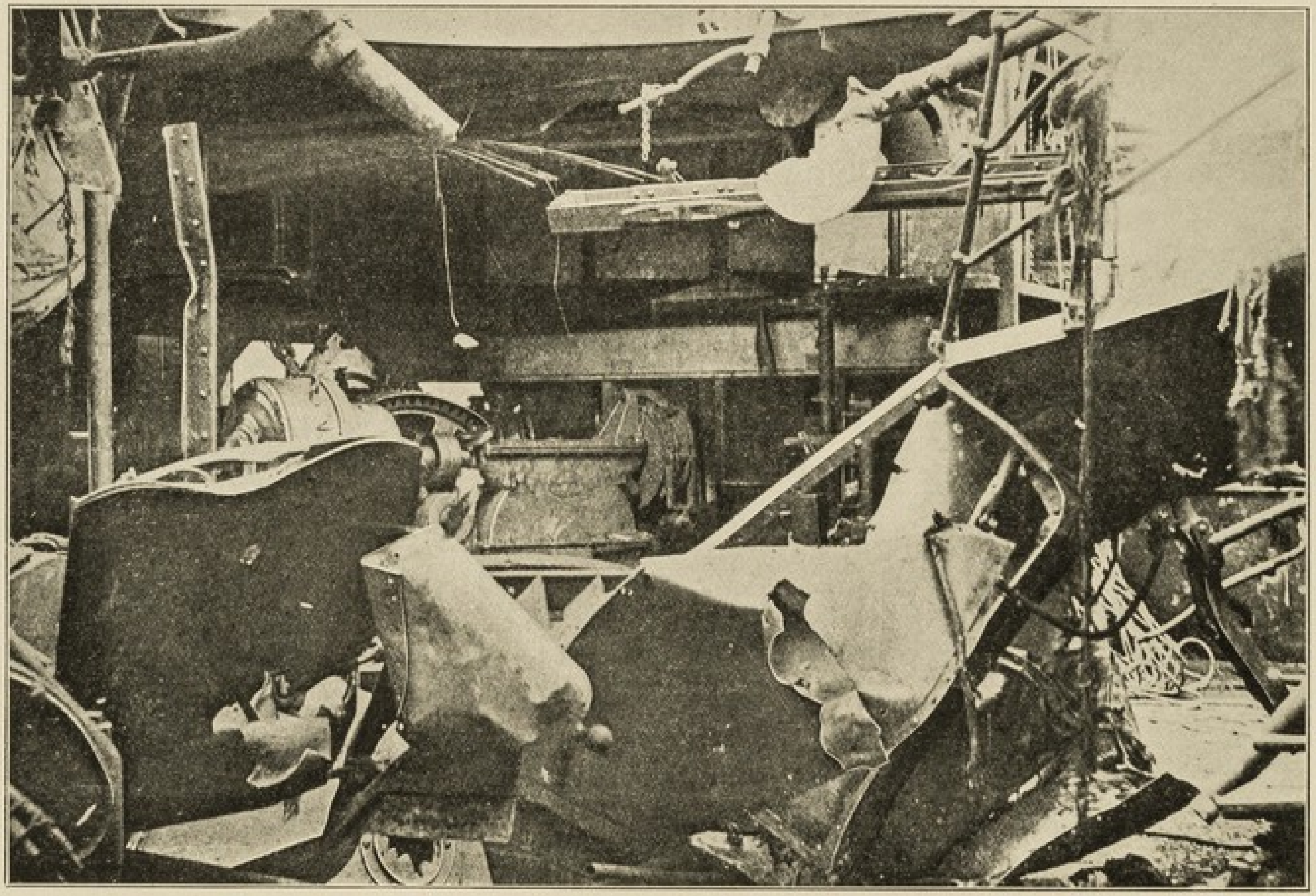
Fourth. Transportation of the wounded.

### 1. THE WORK IN THE HOSPITAL.

A full description, with plans, of this hospital will be found under the head of hospitals, in the beginning of this report. This hospital, which I had seen as a quiet, peaceful institution with only a few patients only about two months before, was now transformed into a most busy, active, and efficient military hospital. All the details for any emergency seemed to have been so carefully planned that without any disturbance or seeming exertion this now great institution was running at its full capacity as smoothly as though nothing unusual had happened. A corps of 15 surgeons—13 naval and 2 Red Cross Surgeons—were in attendance. A large number of skilled and exceptionally fine Red Cross nurses were actively at work supplementing the work of the male nurses. Skilled dressers, anæsthetists, photographer, interpreter, cooks, waiters, messenger boys, etc., were ready for immediate work, and a thrill of life and action ran through the institution that told of the advent of the active work about to follow.

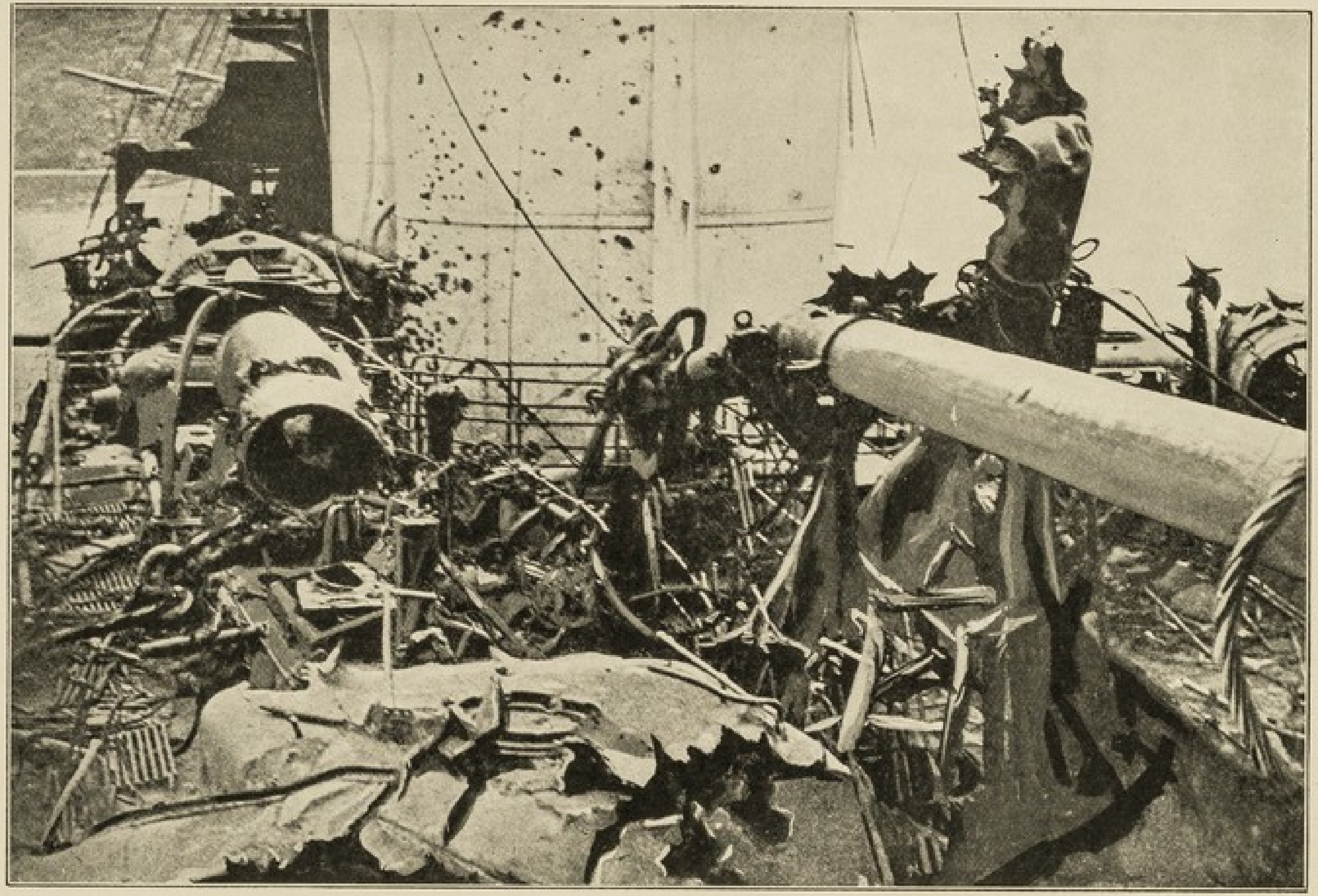
It is to be especially remarked that the Japanese always have plenty of assistants. There is no slighting of work due to lack of plenty of intelligent helpers, all seemingly as interested as though the fate of the day depended on the individual exertion.

11922—06——11



UPPER DECK "OREL" AFTER BATTLE.

Shows why Russians gave little first aid to wounded.



BOAT DECK OF THE "OREL" AFTER BATTLE OF JAPAN SEA, MAY 30, 1904.

To show difficulty of giving first aid to wounded.

The great hospital was swabbed and cleaned twice a day and was always in a neat and tidy condition. This was accomplished by quite a force of cleaners. The long wards of the pavilions were ready with 600 beds and over, all looking so fresh and comfortable that it was pleasant to see—each bed dressed with the usual clean and comfortable bedding and every one fitted with a good mosquito netting to keep the flies and mosquitoes from the sick. Even the new contagious ward, which had never been opened, was brought into use and fitted for the reception of the wounded. At frequent intervals long lines of stretcher bearers would bring 50 or 60 patients from the arriving ships. The patients' clothes and effects were immediately taken to the disinfecting pavilion and sterilized, then tagged and stored in the building set aside for patients' effects; the patients were cleaned and bathed, if possible, and clean kimonos, with stockings and slippers, given each one, and put carefully to bed. Soon an empty ward would be filled and running as smoothly as though it had always been in commission, and even in a few hours' time the condition of the patients, with food and the attention of surgeons and nurses, seemed to materially improve, and an air of quiet and even comfort seemed to pervade the newly opened ward. The temporary pavilions, while, of course, inexpensive structures of pine, as already described, still seem wonderfully well suited to these cases. They are clean and sweet smelling, and there is always an abundance of fresh air. Of course the number of the Japanese wounded was small in comparison with the large number of Russian wounded. The Japanese wounded were also in exceptionally fine condition as compared with the Russian wounded. The Japanese had always had good first-aid dressings and the wounds were, in general, in excellent condition.

The Russian wounded, on the other hand, after the days of suffering under conditions when it was impossible often to get any attention, were sometimes in bad shape; seldom were the dressings, if any, adequate, and often their bodies were coated with dirt, that it was difficult to remove even by hard scrubbing with soap and water. It must, however, be understood that these were only the natural conditions growing out of their defeat, the destruction of their ships, and often the entire destruction of all dressings and the absence of any possible opportunity to care for wounded. In many ships the only thing was an attempt to escape with life. A Russian surgeon explained to me that in his case it was impossible for him to do anything, as everything was swept away by the terrible storm of explosive missiles from the Japanese. In another case the complete medical force, including the surgeons, nurses, and attendants of a dressing station, were rendered unconscious by the carbon-dioxide fumes from the bursting Japanese shells filled with Shimose powder. Whenever it had been possible first-aid dressings had been given by the Japanese.

An interpreter was on hand and was immediately at work taking the names of the Russian wounded, with each man's history; this for record and identification, I presume. The Japanese wounded seemed to take everything very quietly, while the Russians were more apt to express their suffering by moans. The Russians seemed to appreciate the attention of the Japanese surgeons and nurses, and expressions of thanks were often heard. With the advent of the wounded began at once the task of examining the wounds, dressing, operation, etc., where necessary. This work continued day and night, and the indefatigable work of the Japanese was remarkable. They never seemed to tire. One relay of surgeons would be succeeded by another, so that the work might continue while the exhausted detail took sleep and food.

Four operating tables in the main operating rooms were in almost constant use, each table with its complement of skilled surgeons, usually two or three, with deft and rapid dressers, and usually three Red Cross female nurses. The operating outfit was very good and complete, the technique of sterilization and of all pertaining to the conduct of the operation was almost perfect. The surgeon in command was Inspector-General Totsuka, of the Imperial Japanese navy, a man of wide reputation, the inventor of the Totsuka stretcher, and one of the best known and most skillful surgeons in Japan. Associated with Doctor Totsuka is Doctor Kuwabara, whose rapid and brilliant work in diagnosis and operating won my admiration. The rest of the surgical assistants to a man surprised me by their ability and thorough conscientious work. Rarely does one see a more able group of men, collected so quickly, of such fine attainments. It certainly speaks well for the Japanese navy medical corps, and I feel constrained to say, after an intimate association of many months, that the Japanese navy medical corps, taken as a whole, is equal to any, if not superior. Even Inspector-General Kimura, assistant chief of bureau, though a visitor like myself, coming from his office work in Tokyo, immediately prepared for work and performed a number of difficult and skillful operations. I was kindly asked to operate or assist at the operations, if I chose, and had the pleasure of assisting Doctor Kimura and Doctor Totsuka, but on account of not understanding the language I soon found that my efforts were likely to hinder rather than to help along matters, and so contented myself with going from table to table, taking notes of the various cases as the work progressed.

Like everything the Japanese undertake, this work of operating proceeded with the most careful and systematic dispatch, something as follows:

The patient having been placed on the table and dressings removed, Doctor Totsuka and his assistants would proceed to carefully examine the wound, measuring the surfaces, the depth, and noting surrounding conditions. This was always done with most careful deliberation and extreme thoroughness. Having completed the examination and decided on the course to pursue, Doctor Totsuka would then dictate to an assistant a complete description of the case; this assistant would also sketch on the official diagrammatic form (a sample of which is found in the preceding pages under the head of records), the location and extent of injury, and as the Japanese draw well, the resulting sketches are valuable and exact. Having completed the history, the photographer stood ready with a good photographic apparatus and took a picture of each case of any importance. A skeleton was at hand, and often reference would be made to this to indicate the exact location of the wound. Having thus carefully completed the history so that nothing should be left to a faulty memory, the patient was turned over to the hands of the dresser and nurses and the site of the wound was prepared for operation, the surfaces carefully shaved and scrubbed and rendered aseptic.

If, in the opinion of the surgeon, the operation would cause more pain than the patient could reasonably bear, the anæsthethist stood ready to administer chloroform, and if an examination was apt to be extremely painful, chloroform would be given for that purpose also.

Everything being ready for the surgeon, no time was lost in commencing the operation. Here there never seemed to be any hesitancy and all operations were done with marvelous skill and dispatch. The wounds being almost always the result of fragments of shell or splinters were most thoroughly explored for fear of leaving anything foreign within the wound, and oftentimes rather surprising results would follow this careful exploitation.

Having completed the operation, the patient was turned over to the dresser and nurses and proper dressings were skillfully and quickly applied, the patient usually recovering very quickly from the anæsthetic without vomiting or discomfort. The patient would then be wheeled away to the ward and carefully placed in a clean, comfortable bed and under the immediate care of the surgeon in charge of the ward and nurses. One could not but admire the ease with which the above routine was carried out in the case of patient after patient. I spent four days at this institution, coming at all hours, and always found the work progressing in orderly manner as detailed. The food furnished the patients was excellent, and as my meals were brought up from the kitchen through the courtesy of the surgeon in command I had a most excellent opportunity to test the exact character of the ration. Meats, soups, fish, and vegetables were always in abundance, fresh and palatable; the bread always sweet, well baked, and tempting. Many delicacies were to be had, aerated waters if desired; also lemonade, beer, wines, etc.

I was somewhat surprised to note the quantity and quality of the surgical dressings. I had imagined there might be some scantiness of provision in this respect, but there was none. At regular intervals, usually night and morning, great quantities of sterile gauzes, bandages, etc., were brought from the storehouse, resterilized, and the dressing boxes, jars, etc., replenished. There was no hesitancy in using these dressings, and the fact, as before mentioned, that each hospital is a depot for supplies for itself and the ships probably accounts for the abundance of all necessaries of every kind.

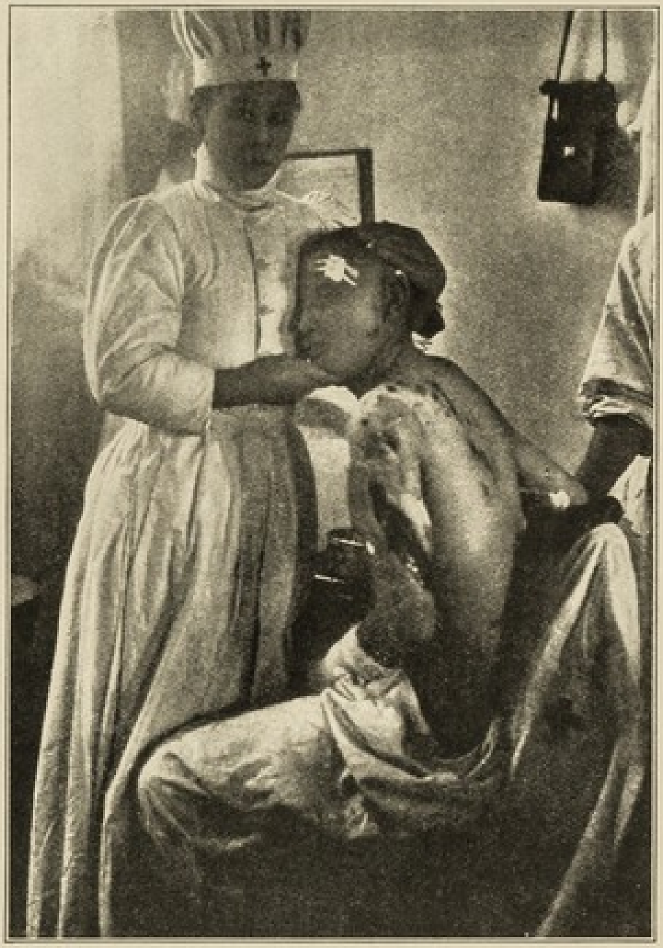
The Japanese and Russian wounded received exactly the same care and treatment; if anything, I am inclined to think they were rather punctilious in being sure that the Russians should receive every attention possible. Soon after entering the hospital, then, all the cases would have received careful attention and dressing and usually after the second day the feeling of well-being and content was so apparent in a given ward that it was immediately felt by the casual visitor.

As to the nature of the wounds and the condition, not much is to be added to what has already been said. Almost all the wounds were due to explosive action, driving fragments of steel shell or splinters of wood into the tissues, and with these fragments often pieces of cloth or other foreign materials that might be in the track of the projectile. As to the parts involved of course they might be any portion of the human anatomy. I should say the most frequent wounds were lacerated flesh wounds, next wounds of the extremities with or without fracture of the bones, next wounds of the head, then wounds of vessels and nerves, next wounds of the chest, penetrating and nonpenetrating, and lastly wounds of the abdomen. Strange as it may seem, I looked in vain for some penetrating wound of the abdomen, but saw none. There were two cases of general peritonitis without any evidence of wounds, supposed to be due to blows. Why such an extensive surface as the abdomen should escape wound is rather surprising, but such was the fact.

It is to be noted that wounds received in naval action, being almost entirely from shell fragments with rough, sharp cutting edges, inflict wounds that differ very materially from the bulk of bullet wounds received in the army. The destruction of tissue is much more extensive and the appearance of the wounds much more startling than the ordinary bullet wound. Also on account of the extent of surface injured; the extensive laceration of tissues with consequent exudate, and the almost certain contamination of these wounds with foreign matter, clothing, powder and dirt, suppuration is almost certain to take place even if first aid is given at once, and it is doubtful if ever, even with the greatest care, we shall be able to avoid the infection of wounds. Thus in these cases almost every one presented evidences of either beginning or in many cases of already extensive suppuration. The wounds of the Japanese were, as a rule, in very good condition, with often a suspicion of infection only, as shown by slight redness and swelling; whereas the Russian wounds were very often dirty, with extensive suppuration, sloughing, or more or less necrosis of tissues. So bad was this in two cases that on the removal of the ill-smelling dressing the whole wounded surface was found infested with maggots. It can readily be seen why this was so. The Japanese had been able to receive good and immediate first aid, while the Russians either had no first dressing or a dressing made under bad circumstances and often with nonsterilized dressings.

Many cases of general infection were noticed with fever. These cases were often extremely critical, and one case was so bad that on placing him on the table the commanding surgeon decided that any interference would be unjustifiable; that this opinion was correct was shown by the death of the man in a few hours. The captain of the *Dimitri Donskoi*, who died the night of June 2, was another case of this kind with a general septicemia following infection of a shell wound of the leg.

The Japanese have learned the lesson of examining with the utmost care even the most innocent-looking shell wound, to be sure that nothing is left in the deeper tissues; indeed the Director-General Saneyoshi, in his article in this report, lays special stress on this point. Many cases could be cited to impress this fact; thus a case presenting what appeared an abrasion of the right patella, on opening up was found to have given entrance to a fragment of shell 1 inch by three-fourths inch, which had fractured the patella and entered and disorganized the knee joint, yet at first glance no such condition would have been suspected, as the wounded tissue of entrance had fallen into place and partly healed; giving an appearance as though the patient had fallen and abraded the knee. Oftentimes when a wound is opened nothing is seen or felt, yet the careful scraping of the wound will often bring to light shreds of clothing imbedded in and seemingly simulating the tissues.



RUSSIAN PRISONER, 120 WOUNDS. TYPE OF NAVAL WOUNDED.

Splinters of wood, if small, are particularly liable to be overlooked, as, often being buried in the tissues surrounded with blood coagula and serum, the wood rapidly disintegrates, and on scraping the wound small, dark, blood-stained specks of wood are brought to view, and, unless felt with the finger, might be mistaken for small blood clots. Other foreign matter may also be driven into the tissues. Thus, in the case of one Russian sailor who had received a very deep wound of the thigh, the shell fragment had passed through his trousers pocket on the right side and carried in before it three gold 20-franc pieces. The surgeon operating had found and removed the superimposed shell fragment, and on going in deeper found the bright gold pieces, somewhat dented and battered out, otherwise in good condition. The Russian on being shown the gold pieces insisted that the surgeon should keep them as a memento. Instances of this kind might be multiplied indefinitely, but only serve to impress on one the need for the greatest care in examining these wounds.

Penetrating wounds of the chest from shell fragments are usually very serious, the sharp edges cutting and lacerating the lung tissue and resulting often in extensive hæmo-pneumo thorax or pyo-hæmo-pneumo thorax. Several cases of this kind were seen, Surgeon Kuwabara making a brilliant diagnosis of the condition of hæmo-pneumo thorax, with crepitation and extensive hemorrhage. The chest wall was opened and a rib resected, and the pleura opened, followed by the escape of several quarts of black blood, accompanied by air.

As before related, some of the most disconcerting and difficult cases are those met with about the head and face. The destruction of tissue and disfigurement is often frightful, as where a man has the jaw shot away or the outer wall of the orbit blown away, leaving the eye and its attendant nerves and muscles exposed to view. In these cases the Japanese excel in plastic surgical operations to restore or repair the destruction. Surgeon Totsuka operated on several such cases, and from the ease and rapidity with which he went about his work one could see that he was a master hand at this most delicate and tedious operative work.

The Japanese pride themselves on being conservative, particularly in the matter of amputations, and whenever it was deemed necessary to amputate, Doctor Totsuka would almost always remark to me in a semiapologetic way that he did not amputate as a rule, but thought the special case in hand offered no choice. Amputations at the shoulder joint and at various points from the hip to the foot and ankle were demanded in some cases where the shell fragment had almost torn the part away. These conditions allowed seldom of any set operation, but required special operations, as the condition of the wounded tissues might permit. I was particularly pleased with the ingenuity exhibited in the making of tissue-saving flaps. Fracture of the skull, with operation on the brain tissue beneath, was fortunately rare, although there were some cases of this kind.

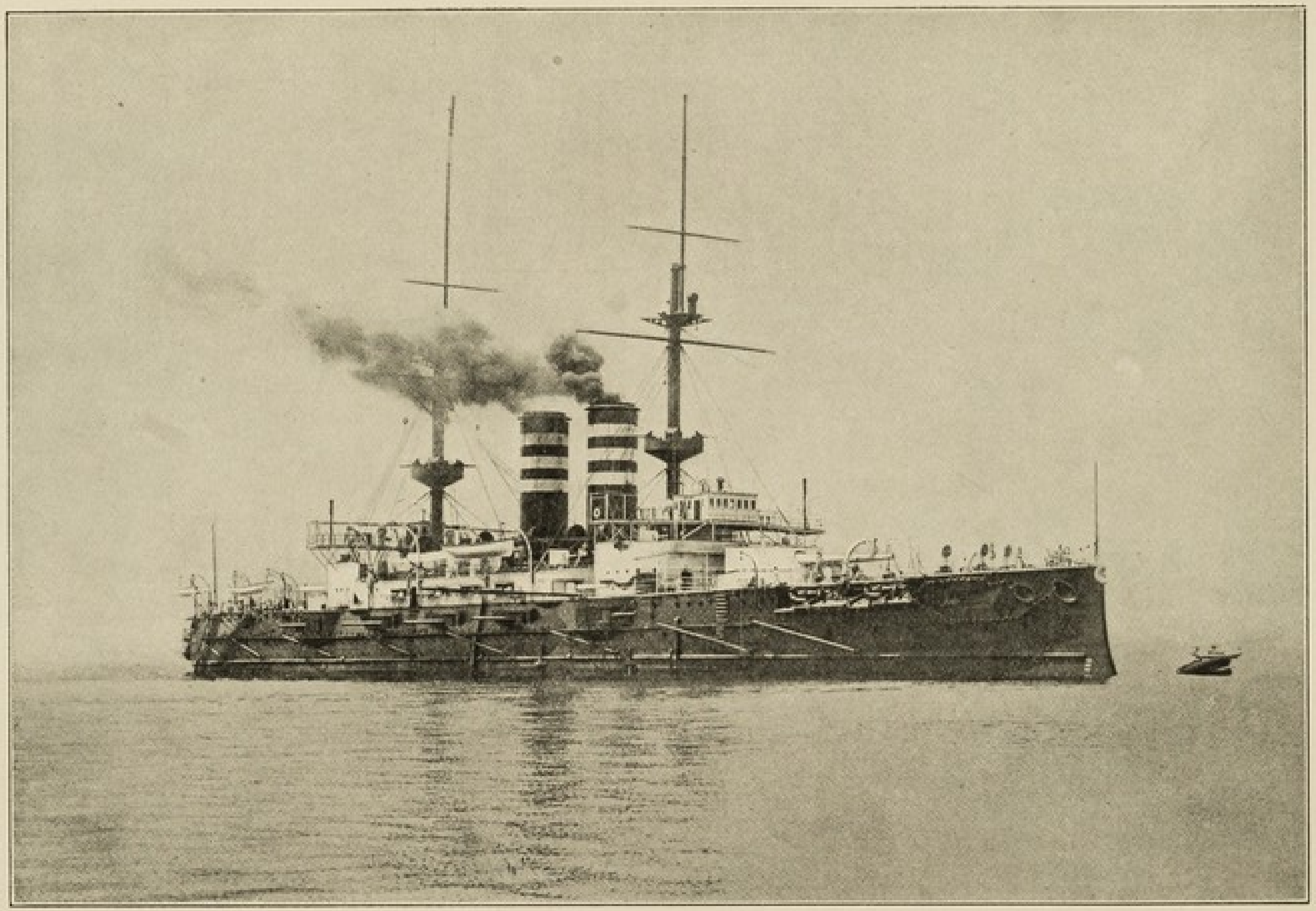
The Russian Admiral Rohjestvensky was wounded in the right temple by a fragment of shell, which was thought at first to have caused a fracture of the skull, but at the time of my departure it was not confirmed. He also had a shell wound of the right leg. He was given the most careful consideration and seemed to be progressing favorably. He spoke English very well, and while he looked like a man who had been through a terrible ordeal, still his mental and physical condition seemed rapidly improving under the care of the kindly Japanese.

The question is often asked me if the Japanese suffer pain as much as the European and whether being of a less highly organized nervous temperament may not account for their apparent low rate of mortality and rapid recuperation. While such an idea is very easily gained by a casual view of the case, on careful consideration and from observation I am inclined to think that the Japanese suffer every bit as much as the European. However, their education of repression of feeling, begun in childhood and carried through life, makes this condition more apparent than real. Neither do I think that the Japanese enjoy any immunity from disease that does not equally affect the European. It is only when properly and carefully treated that the wounded Japanese do well, and the good showing both in army and navy is due to the great care taken of the wounded and diseased. While it is true that a Japanese will often submit to a painful operation or dressing with scarcely any outward evidence of intense suffering, still this is due simply to his habit of self-control and belief that evidence of suffering shows weakness, whereas the Russian, brought up in an entirely different way, may give vent to his suffering in groans and pleadings and even tears. These are racial characteristics and not evidence of more or less pain in either case.

Many cases of extensive burns were noticed, usually of the first and second degree only. They were being dressed with a solution of picric acid, although Doctor Kimura told me he intended to recommend the use of chlorotone as manufactured by Parke, Davis & Co. The effect of the tremendous explosive power of the Japanese shimose powder bursting the shell into minute pieces was noted in many cases, when the bodies of the wounded showed a large number of wounds that could only result from a shower of small fragments. It is especially to be noted that many Russian shells failed to explode, due probably to inferior or defective powder, while the Japanese shell burst with tremendous force. Indeed, the Japanese powder is said to exceed in this respect lyddite, and its destructive power is tremendous. It has occurred to me that this difference in powder might have had more than an incidental influence on the outcome of the battle. Certainly if the Russian shells had exploded, and if the explosion had been of the same tremendous force as the Japanese powder, much more damage would have been done to the Japanese ships. Thus, one 6-inch shell entered the starboard side of the *Mikasa* near or at a gun port. It struck a solid steel fitting and turned forward, passing through three compartments, and passed out the forward starboard gun port, dropping harmlessly into the sea. In its passage it had pierced several compartment bulkheads and struck and scoured many obstacles, but had not burst, and although passing through this portion of the gun deck where many men were at work, not a single man was injured.

## CONDITIONS NOTED ON THE FLAGSHIPS MIKASA AND IZUMO THE DAY AFTER THE BATTLE OF TSUSHIMA STRAITS.

On May 31, 1905, Inspector-General Kimura of the Imperial Japanese navy obtained permission to take me aboard the Japanese war ships then in Sasebo Harbor. It will be remembered that these ships



BATTLESHIP MIKASA. ADMIRAL TOGO'S FLAGSHIP.

arrived direct from the scene of battle on the afternoon of May 30, and I think I was the first foreigner to get aboard these ships and to hear the story of the medical officers concerning their part in the three days' battle.

The *Mikasa*, the flagship of Admiral Togo, was selected as one to be visited, because she was the largest and had suffered more than the others in the battle. The *Izumo* was also visited as being the flagship of Admiral Kamimura and representing the type of large armored cruiser. Before this time I had also visited the battle ship *Chin-yen* at Maizura and the third-class cruisers *Chiyoda* and *Matsushima* at Yokosuka naval station.

From these sources studies as to the care of the wounded in battle, the medical outfits, etc., have been obtained and the general descriptions given under the head of "Battle ships" in this report. It is intended here to give a statement of the actual conditions as seen on the *Mikasa* and *Izumo* on the day after the battle. I had the misfortune to board the *Mikasa* just as Admiral Togo was leaving the ship, but had the great pleasure of meeting him the next day at the naval hospital at Sasebo after he had called on Admiral Rohjestvensky. He seemed in fine health, and his unostentatious manner and quiet dignity impressed me very much. On the *Mikasa* I met Admiral Kato, the chief of staff of Admiral Togo, and Inspector-General Susuki, Imperial Japanese navy, the chief medical officer of the fleet. Doctor Susuki is an exceptionally fine man, of striking appearance, full of life and energy, and with great kindness gave me an opportunity to go about the ship noting the effects of shell and carefully explaining every detail in connection with the arrangements for the care of the wounded.

The *Mikasa* is a large battle ship of some 15,000 tons, built by the English, and of English type. The sick bay and dispensary are on the berth deck, amidships, and inside the armor belt. The sick bay is on the port side, just forward of amidships, and is quite good sized, containing 12 swinging cots of metal. There is also in connection a closet and bath. Aft of this sick bay, by some distance, is a second sick bay with some six bunks, used for the care of sick officers who have no staterooms—i. e., junior officers or cadets. The dispensary is of fairly good size and situated between the forward and after uptakes from the engine room on this same deck. The dispensary, besides the usual outfit of medicines, etc., contains the operating outfit ordinarily used, with white enamel operating table of the American navy type.

It was evident from the general appearance of the ship that much time (days at least) must have been taken in the careful preparation of the ship for the great battle. The surgeons' stations in time of battle are two in number. These dressing stations are established on the lower deck, the deck below the berth deck and below the sick bays and dispensary already mentioned.

On this deck, protected by the heavy armor of the sides and the coal bunkers, and perhaps partially below the water line, two fairly large spaces running entirely across the ship, one aft of the engine room uptake and one forward, were fitted up as dressing stations. The after one was under the care of Inspector Susuki and the one forward under the care of the junior surgeon. Here all dressings for the care of the wounded were laid out, special care being taken to have plenty of good sterile dressings of generous size. At each station there had been established a good-sized tank for sterile water, these tanks being connected to adjacent boilers, so that there was always a good supply of fine sterile water for operations or dressings. An operating table with outfit and good artificial light was provided. Along the sides of the coal bunkers there were hammock boxes, extending throughout the compartment. On the tops of the hammock boxes boards were laid, and the wounded, as fast as dressed, were placed on mattresses on these boxes. This made an excellent provision for keeping the wounded out of the way and keeping them quiet. Hatches leading to the deck above are situated fore and aft, and through these the wounded are conveyed to the dressing stations. The crew had been carefully instructed in first aid, and the carriers or bearers of wounded were especially instructed in this matter. There were set aside for the purpose of carrying the wounded some 50 men from various branches such as bandsmen, cooks, mess attendants, etc.

A generous supply of first-aid packets was distributed about the ship, and special supplies were put near each gun in a large canvas sack, so that there should be plenty of dressings at hand for instant use if needed. The crew, especially at the guns, had been instructed that in case of wounds these were to be immediately protected by first-aid dressings before starting to the main dressing stations. Doctor Susuki said he was somewhat disappointed that the wounded had not carried out his instructions more carefully. About one-third of the wounded did apply or had applied the first aid before coming to the dressing stations; the remainder would simply grasp the wounded portion or member and come to the dressing station. The doctor seemed to think that in this way some infection might have been incurred. The main body of the carriers, instead of being distributed about the gun deck or ship, where they might have been equally exposed to flying shell and splinters with the others, were kept below the deck at the hatch opening, and one carrier remained above deck. As soon as the carriers were needed, the carrier on watch passed the word, and a body of carriers sufficient for the purpose needed would issue from the hatch and bring in the wounded. The doctor seemed to think this quite a point to be observed. Many of the wounded would walk down themselves to the dressing stations or be partially supported by one of their shipmates. When a man was so badly injured that he must be carried, hand carrying was almost always resorted to and almost never was any form of stretcher used.

When a stretcher was necessary, the Totsuka stretcher (a description and cut of which is already embodied in this report under the head of transportation) was used, and Doctor Susuki thinks this stretcher preferable to any other. The advantages of this stretcher are that it can be used as a splint, the bamboo frames adapting themselves to the body and protecting the injured members. It can also be dragged along the deck or allowed to slide down a ladder or a whip, and tackle can be used to hoist or lower the wounded. However, the fact remains that in this war and the China-Japanese war the hand carrying methods were usually resorted to and seem the most sensible and practical methods to use.

As a rule no operations were performed, although in two cases amputations were necessary and performed. The total wounded was 120; of these 20 were so slight that they could continue their work, and of the remaining 100, 23 only were severe enough to be sent to the hospital, the remainder being cared for on board the ship. Six were killed outright, and 2 died of their wounds before reaching the hospital.

In the turrets provision was made for the dressing of cases at the bottom of the turret, but there was no necessity for such work.

Many efforts were made to limit the wounds from fragments of shell and splinters. No woodwork was removed from the quarters. As far as possible, the guns' crews were protected by hammocks and festoons of hawsers, these being intended to limit the flight of shell fragments and splinters. Thus, if there were a starboard and port battery with free intervening space between, a division would be made between the batteries by a row of hammocks or by hanging hawsers, so that if a shell exploded in the starboard battery its action would be limited to the crew of that gun, and the crew of the port gun, being protected by the hammocks or hawsers, would escape the flying débris. The doctor laid great stress on this, and showed me how this principle had been carried out for the protection of the men at every possible point.

On the bridge deck all the open spaces were closed in by using old torpedo wire netting, thus protecting the men at these guns from flying splinters. The same principle was carried out on the fore and after bridge, the railing as high as a man's chest being lined with hammocks or small hawsers. In the same way, but by using chain, the vulnerable parts of the engine-room hatches and uptakes were protected.

Very little damage was really done to the ship proper. One large shell had pierced the armor and burst in the men's head forward on the starboard side and completely wrecked it; one shell describing a parabolic curve had entered the dispensary on the starboard side and exploded in this room, completely wrecking it and destroying all fittings, woodwork, bottles, supplies, etc. In fact, the only thing left was the operating table of white enamel iron. Had this dispensary been used as a dressing station, although within the armored portion of the ship and amidships, probably the entire medical force would have been killed. As it was, a large shell pierced the armor and burst in a coal bunker just outside and on the starboard of the space used by Doctor Susuki as his dressing station. Had this shell penetrated a little farther it would have burst through into the dressing station and, passing athwart ships, would have wiped out the entire dressing station. One shell entered the port side, killed a man, and dropped into the engine room, but as it failed to explode did no serious damage. These were the more serious cases of shell fire. Of course, the smokestacks were frequently riddled, and the surface of the armor plate behind the forward turret showed the marks and scouring of many of the smaller projectiles, but, on the whole, it could not be said that the ship was materially damaged in any way.

Surgeon Susuki called my attention to a bathroom near the dressing station and told me that when serious cases or those supposed to be dead were brought to the station, they were examined immediately as they lay on the stretcher by the surgeon, and if found to be actually dead, they would be quietly passed into this bathroom, thus being immediately removed from the sight of the crew, and any evil influence which the presence of dead bodies might cause was thus averted.

Having completed the inspection of the *Mikasa*, Inspector Kimura next escorted me to the *Izumo*, the flagship of Admiral Kamimura. The *Izumo* is a large armored cruiser of some 10,000 tons. Surgeon Inspector Saito, her chief medical officer, kindly showed me over the ship. There is nothing, however, to be added to the description as given of the *Mikasa*.

The dressing stations were placed in practically the same manner and the work carried on in about the same way. There were 3 killed, 1 severely wounded, and 6 slightly wounded. From these figures one can readily see that the *Izumo* escaped almost miraculously. She was hit by several large shells, one of which pierced the starboard side, destroying partially the dispensary and the room of the junior medical officer. The after part of the ward room was also wrecked by the explosive effect of this shell and the woodwork torn out and the iron floor bulged upward and burst by the explosion.

Several other large shells had struck the ship, but did no special damage. Thus, one shell passed over the quarter deck from the starboard to the port side and chipped a hole in the port waterway, passing on over the side. Many small-caliber missiles had struck the ship, but so small was the damage that the ship was practically ready for sea at any time.

The following list of casualties in the entire fleet is authorized by Admiral Togo:

| Ship. | Killed. | Severely wounded. | Wounded |
|---|---|---|---|
| Mikasa | 8 | 21 | 34 |
| Asahi | 8 | 4 | 18 |
| Azuma | 10 | 7 | 22 |
| Asama | 3 | 2 | 10 |
| Iwate | .......... | 2 | 12 |
| Nisshin | 7 | 9 | 11 |
| Naniwa | 1 | .......... | 16 |
| Hashidate | .......... | 2 | 3 |
| Otowa | 6 | 2 | 18 |
| Niitaka | 1 | 1 | 2 |
| Suka | .......... | .......... | 3 |
| Izumi | 3 | 1 | 6 |
| Chihaya | .......... | .......... | 4 |
| Usugumo | .......... | .......... | 1 |
| Ikazuchi | 1 | .......... | .......... |
| Shirakumo | 4 | 2 | 8 |
| First torpedo-boat flotilla | 6 | 3 | 7 |
| Eleventh torpedo-boat flotilla | .......... | .......... | 1 |
| Eighteenth torpedo-boat flotilla | 2 | 7 | 6 |
| Shikishima | 13 | 7 | 20 |
| Fuji | 8 | 10 | 10 |
| Izumo | 3 | 6 | 17 |
| Tokiwa | 1 | .......... | 14 |
| Yakumo | 3 | 1 | 7 |
| Kasuga | 6 | 3 | 17 |
| Chitose | 2 | 1 | 3 |
| Matsushima | .......... | .......... | 1 |
| Tsushima | 4 | 1 | 5 |
| Akashi | 3 | 1 | 6 |
| Akitsushima | .......... | .......... | 2 |
| Chiyoda | .......... | .......... | 2 |
| Asagiri | .......... | 1 | .......... |
| Akebono | .......... | .......... | 4 |
| Oboro | 1 | .......... | 5 |
| Fubuki | .......... | .......... | 1 |
| Tenth flotilla | .......... | .......... | 1 |
| Seventeenth flotilla | 8 | 4 | 15 |
| Kasagi | 1 | 3 | 5 |
| Total | 113 | 101 | 317 |

Considering the duration of the battle, it is remarkable that the Japanese had so few casualties. The number of Russian casualties will

NAVAL HOSPITAL SHIP SAIKYO-MARU. TRANSPORTATION OF WOUNDED.

probably never be known. The number of missing is variously estimated at from 5,000 to 8,000. Certainly many men were lost in the sinking of the various battle ships.

### THE NAVAL HOSPITAL SHIP "KOBE MARU."

At the time of the battle of Tsushima Straits the hospital ships *Saikio Maru* and *Kobe Maru* were on the Korean coast and did not arrive in time to take an active part in the battle. This would seem to have been unfortunate, as if they had been on the spot they might have rendered very useful service in the rescue of at least many Russian wounded. However, there may have been some good reason for their absence, but I have not been able to learn exactly why they were not present. Of course, the scene of battle was but a short distance from the naval bases and hospitals at Sasebo and Maizuro, and immediately after the battle the ships, with Japanese and Russian wounded, steamed for these ports.

Many wounded had been left, and some of the rescued had been taken to the small hospitals at Tsushima. The *Kobe Maru* picked up some of these, and on June 1 arrived at Sasebo to take on convalescents from Sasebo naval hospital, for transfer to Kure naval hospital, thus relieving somewhat the congestion at Sasebo.

The *Saikio Maru* and the *Kobe Maru* are the naval hospital ships, and a full description of them, with plans, has already been detailed and will be found under the heading "Naval Hospital Ships," in this report. At the time I was writing on hospital ships I was able to see the *Saikio Maru* only, and as she was being repaired and coaling ship she did not present as favorable an opportunity for inspection as could have been wished. I was therefore particularly pleased to be able to see the *Kobe Maru*, to compare her to the *Saikio Maru*, and also to see her under service conditions.

Immediately upon her arrival I proceeded with Inspector-General Kimura to visit the *Kobe Maru*. Her commanding officer and chief surgeon was Surgeon Inspector Ishikawa, a very pleasant and able gentleman, and he immediately offered to show us through the ship. We found everything in most excellent order, the ship beautifully clean, and every possible facility for the care of the sick and wounded, About 100 patients were in the surgical ward. They all seemed extremely comfortable and well cared for; the operating room and its adnexa, surgeons' preparing room, sterilization outfit, etc., fresh painted and in splendid condition. These rooms are quite spacious, the operating room being about 18 to 20 feet long. The surgeon said they had done some operating, but not as much, of course, as they would have done had they arrived on the scene of action sooner. The floors of wards, operating rooms, etc., were covered with linoleum. The closets, bathrooms, and galleys were all clean, neat, and sweet smelling. The dead room presented a neat and attractive appearance. The laboratories and dispensary were in good running order, well stocked, and neat. Quite an extensive outfit of instruments was on hand and in good repair.

The steam washer and disinfecting plant, on the main deck forward, were in good shape and constantly used. The ice and refrigerating plant, capable of producing 1,100 pounds of ice per day, were in use, and the distillers said to be in good shape.

Arrangements were made to take on many patients from Sasebo, and on the lower deck Japanese beds were at hand and some spread, so that convalescents or slightly injured could be placed there. On the whole, the ship presented a most pleasing appearance and was fully up to the required work, with an able corps of medical men and nurses. The most interesting proceeding on the ship, on this visit, to me, was the transfer of the wounded from the hospital to the ship. At the hospital the patients had been carefully dressed and prepared. Some men who were slightly wounded were given their uniforms in place of the usual hospital garments. The clothing and effects of each patient were taken out from the storehouse for patients' effects, tags verified, and such as needed repacking after sterilization were put in orderly shape.

The more seriously wounded and stretcher cases were allowed to wear the hospital garb, which is quite comfortable. Those who were able to walk were marched to the dock, and the stretcher cases were placed on the usual canvas stretcher, with bamboo poles and shoulder straps, and carried to the dock, about one-half mile from the hospital, Usually 2 stretcher bearers were used; in bad cases 4 stretcher men were used. The baggage and effects of patients was loaded into carts and conveyed to the dock. An illustration of stretcher cases leaving Sasebo hospital for the dock is given in photograph No. 34 of the Sasebo series.

At the dock three large flatboats, like large sampans, were waiting, one for the stretcher cases, who were simply laid on the bottom of the boat, without removing from the stretcher, and one boat for the convalescents, who embarked standing, and the third flatboat was used to convey the effects. These three boats, lashed side by side, were towed by a small tug to the ship. On arrival at the ship there were three methods of transferring the patients aboard. The slightly wounded and those able to walk used the gangway and walked aboard. The big cargo port, near the bow of the ship, was open and could be used to take aboard the baggage, or the stretcher cases could be lifted and by the use of a little staging carried directly onto the berth deck and to the medical ward situated at this point. The stretcher cases were transferred by means of a pulley and tackle from a small crane set in the hurricane deck aft. A small hatch was cut in the deck at this point, so that when the stretcher and patient were hoisted to the main deck the crane could be swung inboard sufficiently to allow the stretcher and patient to be delivered with ease on the main deck.

This process was watched with interest. Four men stood at the respective corners of the stretcher on the bottom of the flatboat; the whip was lowered under the direction of a chief nurse; each man at the corners of the stretcher seized his line of the whip and, making a loop, passed it over the end of the bamboo handle nearest him. When all was ready and two men had control of guide lines, the chief nurse gave the order to hoist; when the stretcher reached the main deck it was seized by two assistants placed there and the order to stop hoisting given. The stretcher was then swung inboard with ease, as the crane above could swing with it, and with ease the stretcher and patient were landed on the main deck. From here bearers carried the man to the elevator, if he was to go to the surgical ward, or forward and down the wide companion way if to the medical ward.

NAVAL HOSPITAL SHIP KOBE-MARU. TRANSPORTATION OF WOUNDED FROM SHORE TO SHIP.

When patients were delirious or obliged to lie on the side, they were strapped to the stretcher with canvas strips before hoisting. The usual length of time for such a transfer was about three minutes, and was accomplished without noise or confusion and with the greatest ease.

These are the methods constantly in vogue. The accompanying illustration will give an excellent idea of this method of transfer of a patient from a small boat to the ship. The time of embarkation for the whole number of patients, about 60 or 100, was about twenty-six minutes.

This completed the inspection of the hospital ship. Several captured Russian cruisers were near at hand, among others, the *Nicholai I* and the *Apraxin*, and I should have been very glad to have gone aboard, but it was not permitted.

We then returned to the hospital and spent the time until June 4 watching the care of the patients and operations.

The trip was one of the most interesting, and I can not speak in too high praise of the skill, care, and organization of the entire outfit.

## A FEW NOTES ON FIRST AID, CARE OF WOUNDED, ETC., AS EXPLAINED BY SURGEON TAMURA, OF THE JAPANESE ARMY.

These notes were kindly given me by Colonel Crowder, U. S. Army, with permission to use them. They are of special interest as being the result of experience and observation by a Japanese army surgeon at the front, and will probably be found more fully elaborated in the Army Medical Report. Doctor Tamura states:

> We do not use much in the way of antiseptics in first treatment. Each soldier carries a little bag of first aid containing antiseptic compresses and bandages, and the soldier if wounded applies first the compress and then the bandage. If this is not enough then he must get back to the surgeon for more extensive treatment.
>
> In the hospitals it is a larger question, and there we apply modern methods, but we have developed nothing new in practical methods of securing asepsis in wounds. The use of iodoform is not to apply it directly, but to put cotton cloth over the wound first. A direct application stimulates too much. Prior to this war a first-aid dressing was prepared from ashes of straw, which were placed in a little bag and pressed over the wound. It was invented by Doctor Kikuchi. The effect was to dry the wound quickly, and it had also an antiseptic effect.
>
> Our soldiers are trained in peace to use first-aid dressings and habitually apply them very intelligently, assisted in the worst cases by their comrades. The care with which they are applied is very noticeable, and in case of slight wounds and to some extent with severe wounds this finishes the treatment.
>
> In such cases when the dressing has been carefully done and the bandage does not become too much soiled, it is better to leave it without change. So you see the first dressing is very important. If it is badly done, redressing becomes necessary, and in this way sometimes the wound gets worse. When the wound is larger, such as is made by shells, necessitating measures to stop the flow of blood, or bones have been fractured, the case is different. In these cases the first-aid dressing is of the greatest importance, and is customarily applied on the field by the surgeon with the troops.
>
> While I have no doubt that many practical methods have been developed in our extensive experience in this war, of caring for the wounded, none have been reported as yet: in fact few reports of this character have been received. After the war we shall doubtless have many medical papers on this and other similar subjects.
>
> In each infantry regiment we have 2 surgeons to each battalion and 1 nurse for each company—i. e., 6 surgeons, 3 chief nurses, and 12 nurses.
>
> In battle they form advance dressing stations, and in this way they have been often much exposed to fire.
>
> In each division we have one sanitary corps with 1 captain surgeon as chief and 10 assistant surgeons (lieutenants). The number of nurses I do not know. Each sanitary corps is supplied with 90 stretchers, and generally 4 men are assigned to a stretcher.

The bearers carry the wounded from the firing line to dressing stations (aided in this work by combatants when there is time), thence to the ambulance stations, and from there to the field hospitals. The ambulance stations are supplied with instruments, and considerable surgical work, including some amputations, is done there. It is the duty of the chief surgeon of the division to choose the sites of the ambulance stations, and of the field hospitals as well.

Each battalion carries with it (pack transportation) two medical trunks containing simple drugs and medicines and some surgical instruments, and the nurses carry in knapsacks bandages and dressing appliances. The personnel of the field hospitals includes 1 surgeon major, who is chief, 2 captain surgeons, and quite a large number of lieutenant surgeons. The field hospitals are well equipped. The equipment includes one operating table and complete supplies of medicines and instruments, and they are thus fully prepared for all kinds of work. The cooking arrangements are independent of the troop organizations, and they have also their independent depot from which to supply patients with delicacies and special diet.

When the field hospitals move forward, as they must, with the fighting line, their places are taken by the stationary hospitals, to which their patients are transferred. The work of transferring the patients is undertaken by the medical transport staff, which has made extensive use of Chinese carts for this purpose.

In the battle of the Sha-ho the work of caring for the wounded fell greatly behind owing to the large number of casualties, and every field hospital, of which there are but four to a division (and some of the divisions have only three), had its capacity (300 patients) taxed four or five times over.

The medical transport of a division is commanded by a regular line captain, assisted by a captain surgeon and associated with the latter are several surgeons. Its duties are to transport the patients back from the field to other hospitals. As I have said, it employs for this purpose native wheeled transport. It has the further duty of establishing patient stations en route, where patients can rest over night, and at these they keep a few supplies for the comfort of the patients. The station at the Yentai colliery is one of this character.

Everything in the way of medical service, back to and including the field hospitals, belongs to the fighting troops, and is regulated by the medical staff of the division. The standing hospitals pertain to the line of communications, and there are also the still larger hospitals, called the depot reserve hospitals. When the field hospitals move their places are taken by the stationary (standing) hospitals.

In this way the standing hospitals must move in time, and then the medical officers in the line of communications organize the depot hospitals. It is in these latter hospitals that the Red Cross begins to take part in the work. Here is also the medical staff of the line of communications—that is, the commanding officer of the line of communications has a medical staff. It has to do with the establishment of the depot hospitals and the transport of the wounded over the line of communication to ports of embarkation for Japan.

### MEANS TO PREVENT CAMP DISEASES, ESPECIALLY TYPHOID FEVER.

Both in Korea and Manchuria the native inhabitants have no idea of sanitary regulations. Dirty houses and unprotected wells are the rule with them. Under such conditions anything in the way of infectious or contagious disease was possible. Accordingly, we resorted to the method of inspecting every house in the villages where troops were quartered. This was done even when the stay was limited to one night, and when contagious or infectious diseases were found the houses and their water supplies were avoided.

If the stay was protracted we did a great deal of cleaning and made careful examination of well water, using only the best. If the conditions found in a village were generally bad we had the troops encamp. Orders were issued forbidding men from purchasing food supplies from natives until inspected by medical officers; also from drinking unboiled water. To this last prohibition there was one exception made; we permitted the men to drink from natural springs.

These regulations were generally obeyed by the men, particularly by those with considerable training, but coolies on the line of communication we could not control so well in this regard. Conditions were best in the Twelfth Division, where the commanding general gave special attention to the matter.

During the long delay at Feng-Fang-Ching a special sanitary committee was appointed and a general cleaning of the town was had, troops being used for this purpose. The work was supervised by regimental commanders and under them by battalion and company commanders. The gendarmes and this committee went among the natives and into their homes inspecting for diseases. The sick were reported to the military administrator and thereafter treated by the army medical officers free of charge. This practice was followed subsequently at other places. The police gendarmes were specially charged with the work of inspection, particularly of food supplies, and performed it very efficiently. Where infectious diseases were discovered the water-closets were closed and cleaned and the house disinfected. Lime was the only disinfectant used.

In this way we took general precaution against epidemic disease, and we have had none to deal with except dysentery and typhoid in a small way.

Latrines are generally provided for men in camp, when the stay at a given place is protracted, but where the stop was for one day this has been wholly neglected, each man digging his own latrine. The refuse matter from company kitchens was generally disposed of by draining it into a stream, and where this was not practicable they resorted to cesspools.

The Japanese have a national habit of cleanliness which assisted us greatly in preserving the health of the army. Not only do they take frequent baths but they are cleanly and orderly in their camps.

Military work must be specially regulated and some of the methods in use by army surgeons differ from those of the ordinary practitioner. In our medical service many civilians are temporarily employed. Their lack of knowledge of military affairs prevented them from winning the confidence of the officers or the respect of the men. Their work is much delayed by numerous requests for supplies and means not obtainable in the military service. The result has been very unsatisfactory. We consider special military training for our surgeons very important. Many medical officers who are seeing their first field service in this war are performing their duties with great efficiency because of their special training in maneuvers. Marked differences are to be observed between the surgeons with military training and the civilian doctor temporarily employed, in bearing up under the hardships of field service. The value of special training is quite well established. We use the civilian employee only because of the limited supply of trained surgeons.

Our military surgeons are of three classes: First, the graduates of the Imperial University; second, graduates of other medical colleges, and third, license holders; and their efficiency is in that order. Of the three classes, the first is the least, and the third the most numerous. It is the policy of the chief of the medical bureau of the war department to limit promotion to grades above that of major surgeon to gradautes of the Imperial University. The more important posts in the field work of the army are reserved for the university graduates, who are also given charge of the base hospitals at home. Those who have taken a medical education abroad are treated in matters of promotion and assignment as the university graduate. The better educated men (privates) volunteer to transfer as nurses, and in this way, and by special enlistment, the medical force is built up. They are specially trained in the hospitals and with the troops, and special text-books are provided for their instruction.

### UTILIZATION OF VOLUNTEER MEDICAL AID AND PRIVATE SOCIETIES IN CARING FOR THE SICK AND WOUNDED.

We have made the fullest use of the Red Cross, whose work commences in the depot hospitals and extends back to the reserve and base hospitals and to the hospital ships. Besides, there are the several Red Cross hospitals at home. Of course, in all these hospitals and ships the regular surgeons have the chief places.

We have also employed many physicians who have offered their services and who do not belong to any society. Some were professors in medical colleges and schools. They were employed mainly in the base hospitals and always under an army surgeon.

### CONCLUSION.

The sanitary conditions of the first army have been remarkably good during the entire period of its field service. In the matter of epidemic diseases its favorable record has, we think, no parallel in the history of war. This, we think, is attributable to the advances made in medical science and to the excellent care which officers and men took of themselves and to the precautions observed by our medical officers. Fortunately, cholera has not prevailed in Manchuria to any extent this year. Just how prevalent it has been can not be determined until we have the Russian and native statistics. We are apprehensive as to what the conditions maybe next year.

In the matter of transport of sick and wounded our methods are very far from perfect, and we must make marked improvement in this regard before we can pride ourselves in the matter of equipment. As I have stated, the Chinese cart was our principal reliance in moving patients back from the field hospitals. In getting the wounded back from the firing line to the dressing and ambulance stations and field hospitals we had only the stretcher. We had no wheel litters or mule litters.

Disease generally greatly decreases the fighting capacity, and medical instruction of officers and men is quite as important as their instruction in combatant duties. We give our officers a course in sanitation at our military colleges, and the men are instructed by lectures given partly by medical officers and partly by officers of the line, but much more instruction along these lines is needed. It is noticeable that the more educated classes, like the one-year volunteers, take better care of themselves than the ordinary private, and are rarely on the sick list.

### NOTES BY PROFESSOR BAELZ, UNIVERSITY OF TOKYO.

*Typhus and typhoid fever.*—Doctor Saneyoshi is quite right that in Japan as in Germany the word "typhus," an abbreviation of "typhus abdominalis," is generally used for typhoid. Yet typhus epidemics occasionally occur. I have heard of no cases during this war, but there was plenty of it, and of relapsing fever during the Chinese war, 1894–95.

*Cerebro-spinal meningitis.*—Lumbar puncture is, as far as I know, used more for diagnostic than for therapuetic reasons.

*Beriberi.*—In kakke there is usually no albumen and no casts to speak of. There is no deep-seated pain in kakke; in fact no pain whatever, except on pressure on certain muscles, particularly the gastrocnemii. Kakke is rarely overlooked, because every Japanese knows that paraæsthesia (numbness, formication) is one of its symptoms, and he generally makes the diagnosis himself.

*Malaria.*—It is not at all uncommon in Japan, but is of the mild tertian form only. There are districts where almost the whole population is attacked. I remember the report of such a case, when it was stated that out of 50,000 inhabitants over 17,000 suffered from malaria. But the disease is undoubtedly getting rarer.

*Scurvy.*—I have been told that very few Japanese suffered from scurvy, and those who did were mostly men who had been prisoners in Port Arthur. In ordinary times scurvy is quite unknown in Japan.

*Smallpox.*—Not only vaccination, but revaccination is general. According to the German system all school children are revaccinated. Therefore, in the Japanese army smallpox is unknown as it is in the German army.

*Dysentery* (under preventive medicine).—All that can be said of Shiga's serum is that its inventor considers it efficacious, but that other doctors have not been so fortunate in their results with it. In fact, most hospital doctors declare it to be useless. From the way you put it in your report you will produce quite a wrong impression about its value. To me, as to those who have had experience with dysentery in Japan, the cases given by Shiga in his pamphlet are no proofs, as such cases often take the same course without serum.

The following translation of the "Official Army Sanitary Rules" for petty officers and men is submitted. This may be of interest as showing the exact working rules in use in time of war. No attempt has been made to change the idiomatic Japanese phraseology of the translator. These rules are issued in neat pamphlet form to each man of the force.

### I.—*Hygiene of the body.*

1. Whitlow, boils, toothache, and any such bodily disorder, even of slight nature, tend to decrease the fighting capacity of an army by obstructing the free action of the body. As these disorders are mostly caused by uncleanly habits, it is necessary that every one should keep his body clean.

2. In time of war it is generally very difficult to take regular baths, therefore every man shall wipe off the body dirt with cold water, especially the arm pits, thighs, and pelvic regions.

3. The hair shall be worn short, and shall be washed from time to time to prevent skin eruptions and parasitic diseases, such as lice.

4. Every morning the mouth and teeth shall be carefully cleaned.

5. The hands being in constant use are soiled more readily than any other member of the body and in this manner various eruptive disturbances may be caused, such as whitlow, etc. Infection present on the hand can most easily enter the body, therefore the hands shall be washed with soap and water frequently.

6. The feet, like the hands, are also easily soiled and being encased in shoes evaporation does not take place readily, thus bad odors are generated and the feet become sore. Therefore the feet shall be washed as soon as one gets into his quarters. Those who ride on horses should wash the inner thighs and pelvic regions to prevent gall caused by the saddle.

7. Dirt allowed to collect under the finger nails often contains dangerous disease germs, therefore the nails should be kept carefully trimmed and cleaned. Care should be taken not to trim the nails too close as this will cause them to become sore.

8. Chaps and cracks, on hands and feet, caused by the cold in winter often introduce into the body disease. Therefore the hands and feet shall be well washed and an ointment carefully rubbed in.

### II.—*Hygiene about the clothing.*

1. The object of clothing is to keep the body warm. But too much clothing, causing unnecessary perspiration, is injurious. Especially while working, light dressing is advisable so as not to perspire too freely. However, when doing nothing or on duty at an outpost or as sentinels, every means shall be taken to guard the body against the cold.

2. Overcoats are the principal means of keeping off the cold and are often the sole bed clothes, so that they must be very carefully treated, and when they get wet on account of rain, snow, etc., they shall be instantly dried on arrival at the quarters.

3. Undershirts, drawers, and stockings shall be washed very often, for there will be no use in keeping the body clean if the under-garments are soiled.

4. In mending any rent in drawers care shall be taken not to make the seam too thick. Especially must this be remembered by those who ride on horses, because such a seam often causes saddle gall.

5. An abdominal band is effective to prevent cold of the abdomen, so that it shall be worn always, and when it gets soiled it shall be washed early in the morning so as to dry during the day.

6. Stockings shall be changed very often; if torn or wet stockings are put on as they are, they may cause shoe gall or frostbite.

When there is no change of stockings or when stockings alone are not sufficient to keep off cold, take strips of cotton or woolen cloth (flannel is best) and wind them on the feet before putting shoes on.

7. Shoes shall be kept soft. Shoe gall is caused not only by ill-fitting shoes but also by their hardening. To keep shoes soft there is no method other than to oil them with fat.

8. To make hardened shoes soft, steep them in water or rub them with a brush steeped in water till they become soft. Then wipe off the wet and oil them, in the sunshine or near the fire, with melted lard.

9. The shoes are the horses of the foot soldiers, and must be taken care of as horses should be by cavalry men.

10. Damaged shoes cause foot-sore, and every care must be taken for their preservation.

It is not good to dry wet shoes by exposing them to a scorching fire. First put heated straw in them or woolen stuff and dry them gradually by exposing them to a slow fire.

11. When shoes are damaged in winter and there is no change, cover the feet with hay or softened rice straw (floss silk is best); wind upon them strips of cloth, and then put on "waraji" (straw sandals.)

### III.—*Hygiene concerning food and drink.*

1. Food is the source of bodily strength, and in time of war when we overexert ourselves we must take enough food so as not to feel hunger, otherwise we shall be fatigued and shall not be able to work as might be desired; we shall be less able to bear the cold and shall more easily be attacked by various kinds of diseases. Always remember, however, that overeating and overdrinking are injurious to health under any circumstances.

3. When fatigue is very great or when the body is heated, it is better to take food after a short rest.

4. Never take any auxiliary food when it gives out a bad odor or when any change in its flavor is perceived.

5. Ripe fruits contain more or less nutritious matter and appease thirst, and they may be taken after peeling. Unripe fruits are apt to cause diarrhea, so that they shall not be eaten, especially when there are cases of dysentery or cholera is prevalent.

6. Unboiled foodstuff and water sometimes contain dreadful disease, so that they shall never be taken as they are.

7. The water of wells actually in use, of known waterworks, of mountain streams, rivers, springs, etc., may be used for drinking purposes; but, if possible, it shall be boiled before using.

8. The water of an old well, of a pond, swamp, etc., may not be free from poison, even after boiling, so that it shall never be used except in case of necessity.

9. Foodstuffs left by the enemy, the water of the wells of a district newly occupied, and foodstuffs stored by people of such a district shall not be used without precaution, as they may be mixed with poison.

10. Tea, coffee, etc., are refreshing drinks, so that it is well to use them when fatigued. Tobacco has similar merit.

11. Spirituous liquors when moderately taken, relieve fatigue and restore the spirit; but overdrinking is very injurious, so that they shall be very sparingly used.

While there exists any necessity of guarding against frostbite, freezing, sunstroke, etc., intoxicating liquors, shall, as far as practicable, be abstained from.

### IV.—*Rules to be observed while on march.*

1. On the day before starting put the shoes and stockings in good order, wipe well the body, take food and drink with caution, and sleep well. Those who have passed the night in debauchery and have not slept well will feel fatigue on the way the most and are more apt to be attacked by frostbite, sunstroke, etc.

2. Before starting, tie all the strings firm and fasten all the buttons. In a cold time if you find while marching any string untied or any button unfastened, your hands may be benumbed and you may not be able to fasten it.

3. Before you start fill your flagon, preferably with boiled water or tea.

4. While marching try to keep the same cadence all the way through, and avoid walking with the head hung down.

When ascending a slope or marching against a cold wind, it is better not to talk much nor smoke.

5. Except in case of necessity, never leave the ranks, for then you will have to run to regain your place, and running by starts will cause fatigue.

6. Try to drink water sparingly. If you fall into the bad habit of drinking water whenever you feel thirsty, the more you drink the more thirsty you will become.

7. Never drink cold water at once when your body is heated. It is very injurious and sometimes causes even death. In such cases first moisten your mouth and then drink little by little.

8. When you feel thirsty on the way, never eat ice or snow; you will complain of thirst all the more.

9. While taking rest button the coat well over your breast and never expose your head to the sun.

10. It is injurious to rest on the damp ground when your body is heated. Choose the dry places or spread straw, hay, branches of trees, etc., and sit upon this.

11. While taking rest, examine your feet, and if there is any part reddened ask the surgeon for an ointment or a powder composed of 87 parts of talc, 3 parts of salicylate of sodium, and 10 parts of starch.

12. While resting examine your stockings and smooth any fold, or change left and right, or when they are wet put on new ones.

13. To rub the feet, while resting, with a wet cloth, to wash the face, neck, and hands with water is a means to recover the spirit and refresh the body.

14. In case there is no water when you want a drink, while resting, put "umeboshi" (salted plum) in your mouth, and when you have no "umeboshi" chew harmless leaves or straw; it will stop thirst.

### V. *Rules to be observed in camps.*

#### (*a*) WHEN QUARTERING IN HOUSES.

1. In China and Korea rooms are warmed by heating the floor. In such rooms if you use charcoal hibachi, as in Japan, carbonic-acid gas will accumulate, which may prove fatal to the inmates.

2. When "ondolu" or "kau," as the warming apparatus is called in Korea or China, is out of order, charcoal may be used, but in this case part of the windows shall be left open day and night, or new windows shall be made for ventilation.

3. In Korea and China there are enormous swarms of flies. They crowd on the food and there is danger of their thus spreading contagious disease. Everyone should carefully guard against them. There are also bedbugs everywhere. They not only disturb sleep, but cause skin disease. Everyone should take proper measures against them or ask the surgeon for an insecticide.

4. In Korean and Chinese houses there are no water-closets. These should be, of course, constructed by the staff, but when they are not made in time no one shall leave any excreta exposed for flies to crowd upon and spread disease, but all such excreta shall be carefully buried.

#### (*b*) BIVOUAC.

1. When quartering in tents, air the tents during the day, except on rainy or snowy days; in warm climates the tents shall be left open even at night.

2. Straw, hay, leaves, etc., used for beds within tents shall be exposed to the sun very often.

3. In bivouacking by pitching portable tents, close quarters will be advantageous in cold climate and open quarters in warm climate. When there are spare tents they shall be

spread upon the ground to protect against the damp or wound around the legs to protect against the cold.

4. In bivouacking in winter we feel the cold most in the feet, and they are the parts most easily frost-bitten. Before you sleep, therefore, wear two or more pairs of stockings, wrap them with straw, and cover them with the overcoat.

5. When you bivouac on snow, never lie down upon the snow, for however well you harden it it will melt and take away your body heat, disposing to frostbite or causing you to freeze to death. Take, therefore, snow from the ground and build an embankment, with the entrance always to lee side.

6. Concerning the water-closet, it is same as in the case of quartering in houses.

### VI. *Precautions against diseases commonly occurring while marching.*

The diseases which give the greatest trouble to an army while on march are shoe gall, frostbite, sunstroke, etc. Of these sufficient has been said of shoe gall under the headings of the body and clothing. We shall give here precautions against frostbite and sunstroke.

#### (*a*) FROSTBITE.

1. The parts where frostbite most easily occur are the extremities of hands, feet, ear, nose, etc., so that when you march in winter special attention shall be paid to these parts. Especially the hands and feet shall be rubbed with ointment before starting.

2. The most effective prevention of frostbite and freezing to death lies, besides wearing clothing to keep off cold, in taking sufficient nutrition and sufficient sleep. If one does not sleep sufficiently, he feels languid; if one lacks nutrition, the temperature of the body will be lowered, and he will be less able to resist external influences. These cause frostbite and death by freezing. So in winter eat sufficient and sleep as much as time allows.

3. When you drink "sake," you feel warmth for a time in your skin, but the heat of your body decreases. Moreover, "sake" makes one sleepy, which causes frostbite or death by freezing, so that while there is any danger of frostbite you shall abstain from "sake."

4. One thing that can not be omitted in the prevention of frostbite or freezing to death is exercise. Exercise promotes the circulation of blood and increases bodily heat; so that those who have to remain at one place, such as sentinels, shall try to take exercise, as by marking time, etc.

5. Massage is a kind of exercise of the part rubbed, so that if the ears, nose, hands, feet, etc., become insensible it is the beginning of frostbite, and such parts shall be rubbed.

6. Headdress, gloves, and stockings are means of guarding against frostbite, and they shall be carefully kept in good condition, mending them whenever there are rents in them.

7. Be careful not to touch cold metal articles with the naked hands, especially when they are wet; it will cause frostbite.

8. The feet are the parts most easily frost-bitten, caused by wet stockings freezing while on the feet. Care shall therefore be taken not to allow water to get inside of the shoes, especially when crossing a river or marching on the snow. Whenever water enters the shoes or the stockings become wet by sweat of the feet, change the stockings while taking rest.

A famous general of old said that the secret of winning victory lies in the legs, so that the greatest care must be taken of the feet.

9. The extremity of the genital organ is sometimes frost-bitten, so that you should never forget to button the trowsers after urinating.

10. The symptoms of frostbite are: First a feeling of chilliness of the part, then pain and then loss of sensation.

This is the first stage of frostbite and in this stage it is injurious to warm the part by fire. Rub the part with snow or with a cloth steeped in cold water, then wipe well the part and rub with ointment. When frostbite progresses further, the part changes color and becomes swollen. At this time if medical treatment is given immediately the part affected will get well.

11. If any of your comrades should fall down on the way, his limbs become stiff, his breath faint, and if he gives no reply to your call, then treat him according to the following instructions till the surgeon comes, but never try to warm him nor bring him too near a fire:

(*a*) Carry the benumbed man to a room where there is no fire, strip off his clothes, and rub him all over with snow or with cloths steeped in cold water.

(*b*) While rubbing, when the limbs become soft, put him into a tub of water, continue rubbing, at the same time pouring in gradually hot water. When there is no tub to put the patient in, then try artificial respiration at once.

(*c*) When the water of the tub becomes tepid, then take the patient from the tub, wipe him well, lay him down on a bed, and perform some method of artificial respiration.

(*d*) When the breathing is restored, then give him luke warm tea and make him lie down in bed.

12. While marching on snowy ground an eye disease (snow blindness) is caused by the reflection of the sun's rays. Avoid walking with your head down, and it is advisable to use eyeglasses of slightly dark color or an eye curtain to protect your eyes against reflection of the sun's rays.

13. While marching over a frozen river or lake, never put your hands in your pockets, because in case you break through the ice your hands being in your pockets will not assist you.

### (*b*) "YETSU-BYO" (HEAT DISEASES).

1. This is the general name of sunstroke and other diseases caused by hot temperature, and which are very dangerous, occurring very often during the march in a hot climate.

2. Those who are not accustomed to marching, those who are weak in constitution, those who have overworked themselves, those newly recovered from disease, those who have not slept well, or who have indulged in venereal excess, or who suffer from hunger, thirst, or excessive drinking, etc., are very apt to be attacked by this disease.

3. The precautions to be taken by everyone against sunstroke are: To be careful of their health, to abstain from "sake," to fill always the flagon with water (against the time you may be thirsty), and to eat and sleep sufficiently, to leave early in a hot climate and take rest during the heat of the day, to march in open order, to lighten the burden, to bare the breast, shall be as ordered by the commanding officer.

4. The symptoms of sunstroke are excessive perspiration, pain in breast, shaking of legs, difficulty in breathing, dizziness, and a feeling of faintness. At this stage the patient shall leave the ranks, rest in the shade, drink, open his clothes, and wash his head and breast with cold water, and he shall recover.

If, however, such a patient continues to march in spite of the foregoing symptoms, the perspiration will stop, his skin become dry, saliva sticky, pulsation rises, breathing becomes faint, and he will at last become insensible, and if medical treatment is not given in time the case will end fatally.

6. In case anyone should fall insensible from sunstroke the patient shall be treated as follows till medical aid arrives:

(*a*) The patient shall be placed in the shade where the current of air is good. Then take off his coat and pantaloons and loosen his underwear. Let him lie down with his shoulders raised. Unnecessary crowding around the patient must be forbidden.

(*b*) Then wash his head and breast or the whole body with cold water, or wind the body with wet cloths, sprinkling them now and then to keep the cloths wet.

(*c*) When the breathing is impaired then perform artificial respiration.

(*d*) While performing artificial respiration send a current of air over the face with a fan continually.

(*e*) Rub the hands and feet of the patient.

(*f*) If the patient recovers consciousness, then give him plenty of water.

### *VII. Precautions against contagious diseases.*

1. Contagious diseases do not originate within but are introduced from without, so that with proper precautions they can be prevented.

The causes of such diseases are generally minute bacilli—invisible to the naked eye. When they enter into the body and get proper lodging place, they multiply in wonderful rapidity, causing serious disease and at last death. From olden times and in every country the number that die of disease during a war is always greater than the number that fall in battle, and this is principally due to contagious diseases. Such being the fact, the staff takes strict measures for the prevention of them, and everyone shall strictly observe orders given them, at the same time not neglecting to pay rigid attention to their health themselves.

2. The most common disease that visits the army in war time as well as in peace is typhoid fever. The cause of this disease enters into the body through the food, so that the first preventive measure is not to eat and drink anything unboiled. The poison also attaches to clothing, fingers, etc., and then enters the mouth, so that everyone shall take care to dust well his coat, wash his undergarments very often, and wash the hands before meals.

3. Dysentery and cholera also enter into the body by the medium of food, and precautions against these diseases are practically the same as in the case of typhoid fever. Unripe fruits cause diarrhea, so that such fruit shall not be eaten.

4. Smallpox still prevails in China and Korea, therefore even those who have been vaccinated shall not approach the patient nor the house in which there is such a patient.

5. Pest generally enters into the body through a wound in the skin, so that when there are signs of the prevalence of this disease, even for a small scratch, one shall ask for medical treatment. Never walk in the bare feet, and always wear gloves.

Rats and flies are the principal mediums of this disease, so that means must be taken to exterminate them, and they shall not be allowed to touch the food.

6. Malarial fever or ague spreads through the medium of mosquitoes, so that care must be taken not to be stung by them.

7. Venereal disease is the general name for gonorrhea, bubo, and syphilis, and is caused by intercourse with women affected with the disease. All the prostitutes in China and Korea must be considered as affected with the disease. Never approach them. If you do, you will bring upon yourself calamity, expose yourself to shame, and leave the evil to your posterity.

8. Of eye diseases of a contagious nature the most fearful is trachoma. This disease spreads by using a common basin and towel to wash the face. So when there is a case of such disease never use a basin and towel in common, and if there is only a limited number of basins, use them after washing them with water several times.

If anyone who is suffering from gonorrhea touch his eye with his soiled fingers, gonorrheal ophthalmia will be caused, which will end in the total loss of sight.

Many other translations and illustrations are necessarily omitted, those presented are sufficient to give a clear idea of the points investigated.

*Statistics of killed and wounded of the naval force.*

| Date. | Sites of engagements. | Total killed and wounded. | Dead. | | Recovery. | | Patients remaining. | |
|---|---|---|---|---|---|---|---|---|
| | | | Killed at once. | Death after wounded. | Served again. | Invalided. | Inpatients. | Outpatients. |
| February 9 | Port Arthur | 72 | 3 | 6 | 59 | 3 | 1 | ...... |
| February 24, March 27, and May 3. | First, second, and fourth blockade of Port Arthur | 129 | 81 | 2 | 46 | ...... | ...... | ...... |
| March 10 | Battle of destroyers, Port Arthur. | 23 | 7 | 2 | 13 | 1 | ...... | ...... |
| April 13 | Port Arthur | 7 | ...... | ...... | 7 | ...... | ...... | ...... |
| April 25 to May 1 | Bombardment of the Yalu bank. | 4 | ...... | ...... | 4 | ...... | ...... | ...... |
| May 3 | Protecting flotilla for third blockade. | 4 | 2 | ...... | 1 | 1 | ...... | ...... |
| May 12 and 14 | Sweeping of Tahyovkow. | 43 | 8 | 1 | 33 | 1 | ...... | ...... |
| May 15 | Sinking of the Yoshino | 320 | 319 | ...... | 1 | ...... | ...... | ...... |
| Do | Sinking of the Hatsuse | 587 | 494 | 1 | 92 | ...... | ...... | ...... |
| May 15 to 20 | Port Arthur | 31 | 20 | 4 | 7 | ...... | ...... | ...... |
| May 26 | Bombardment of Kinchow Bay. | 14 | 2 | 1 | 11 | ...... | ...... | ...... |
| May 30 and June 6 and and 7. | Port Arthur | 10 | 2 | 2 | 6 | ...... | ...... | ...... |
| June 13 | Sweeping of Talian Bay | 35 | 19 | 4 | 9 | 3 | ...... | ...... |
| June 22 to 27 | Port Arthur | 37 | 19 | 1 | 15 | 2 | ...... | ...... |
| July 5 | Sinking of the Kaimon | 29 | 22 | ...... | 7 | ...... | ...... | ...... |
| July 8 and 9 | Port Arthur | 5 | ...... | ...... | 5 | ...... | ...... | ...... |
| July 13 to 26 | ......do | 57 | 10 | 4 | 40 | 2 | 1 | ...... |
| July 28 to August 9 | ......do | 61 | 29 | 2 | 27 | 2 | 1 | ...... |
| August 8 | Sea fight of the Yellow Sea. | 226 | 65 | 6 | 143 | 7 | 5 | ...... |
| August 11 and 12 | Capture of enemy's destroyers. | 17 | 1 | ...... | 14 | ...... | 2 | ...... |
| August 14 | Sea fight off the Ulsan | 124 | 36 | 10 | 74 | ...... | 4 | ...... |
| August 16 to 25 | Port Arthur and Pigeon Bay. | 20 | 11 | ...... | 9 | ...... | ...... | ...... |
| August 30 and September 3. | Port Arthur | 36 | 21 | ...... | 15 | ...... | ...... | ...... |
| September 10 to 15 | Port Arthur and Pigeon Bay. | 34 | 29 | ...... | 4 | ...... | 1 | ...... |
| September 18 | Sinking of the Heiyen | 197 | 197 | ...... | ...... | ...... | ...... | ...... |
| September 19, 21 and 30. | Lunwangtung and Port Arthur. | 3 | 3 | ...... | ...... | ...... | ...... | ...... |
| October 11, 17, and 26 | Port Arthur | 14 | ...... | 1 | 12 | 1 | ...... | ...... |
| November 2 to 30 | ......do | 35 | 6 | 2 | 26 | ...... | 1 | ...... |
| November 30 | Sinking of the Saiyen | 67 | 38 | ...... | 29 | ...... | ...... | ...... |
| October 4 | Port Arthur | 11 | 11 | ...... | ...... | ...... | ...... | ...... |
| December 10 to 16 | ......do | 355 | 304 | 11 | 34 | 1 | 5 | ...... |
| July 26 to December 30 | Landing party | 355 | 31 | 29 | 258 | 10 | 27 | ...... |
| January 22, 1905 | Port Arthur | 13 | 7 | ...... | 6 | ...... | ...... | ...... |
| May 27 and 28 | Japan Sea | 699 | 90 | 27 | 401 | ...... | 99 | 82 |
| | Total | 3,674 | 1,887 | 116 | 1,408 | 34 | 147 | 82 |

*Killed and wounded, arranged according to rank.*

| Rank. | Total killed and wounded. | Dead. |  | Recovery. |  | Patients remaining. |  |
|---|---|---|---|---|---|---|---|
|  |  | Killed at once. | Death after wounded. | Served again. | Invalided. | Inpatients. | Outpatients. |
| Officers | 304 | 160 | 11 | 113 | ........ | 12 | 8 |
| Warrant officers | 86 | 43 | 4 | 36 | 1 | ........ | 2 |
| Petty officers and men | 3,219 | 1,652 | 97 | 1,236 | 33 | 132 | 69 |
| Employees | 65 | 32 | 4 | 23 | ........ | 3 | 3 |
| Total | 3,674 | 1,887 | 116 | 1,408 | 34 | 147 | 82 |

Respectfully submitted.

William C. Braisted,
*Surgeon, U. S. Navy.*

The Chief of Bureau Medicine and Surgery,
*Navy Department, Washington, D. C.*

O