

**Military hygiene of the Japanese army / by Baron K. Takaki, F.R.C.S.E., D.C.L., late Director General of the medical department of the imperial Japanese navy.**

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JAPANESE ARMY.

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D.C.L.

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WITH COMPLIMENTS  
—OF THE—  
AUTHOR.



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## MILITARY HYGIENE OF THE JAPANESE ARMY.\*

By BARON K. TAKAKI, F. R. C. S. E., D. C. L.,  
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OF THE IMPERIAL JAPANESE NAVY.

The medical organization of the Japanese army department with the education of the medical officers, the hospital corps, etc., is much similar to that of the Japanese navy, so that its description in detail would be simply a waste of time, and I believe that it is already too well known to the world.

The health of our army has been gradually improving in late years, but beriberi (kak'ke) is not eradicated as it is in the navy, and I regret to state that although the cases are few in time of peace at home, the disease is apt to break out in time of war when strong men are needed. In former years beriberi prevailed largely in the army, as it did in the navy, but now it occurs less frequently. The following table explains the facts:

BERIBERI PER 1,000 OF MEN.

Name of division.	Year. 1883.	Year. 1884.	Year. 1885.	Year. 1903
Imperial Guards.....	489.53	486.56	269.82	} 14.63
Gendarmes .....	408.17	354.54	254.96	
Academy, etc.....	607.70	725.00	412.12	
School of sergeants, etc....	217.82	412.89	349.81	
Tokyo .....	349.88	467.99	311.16	
Sendai .....	120.16	216.02	138.36	
Nagoya .....	119.55	100.24	94.58	
Osaka .....	308.31	232.90	7.07	
Hiroshima .....	144.82	2.85	3.08	
Kumamoto .....	102.95	154.75	39.17	
	276.75	315.37	188.01	

This table shows that the disease was violent in

\* Cartwright Lecture given before the Alumni Association of the College of Physicians and Surgeons (Columbia University) of the City of New York.

its attacks. The different sections of the army suffered differently as to numbers, so that the hospitals provided for certain divisions were inadequate to take all the cases of beriberi; therefore in order to meet such emergencies other accommodations were provided in the neighborhood to which patients were sent, such change of air being considered beneficial and curative.

The number of beriberi cases greatly diminished in 1885 in the Wagoya division. This result is considered to have been due to the introduction of a diet of rice with barley, in proportion of seven to three. The Hiroshima division has suffered very little in general. The price of food is less there than at other places, so that better and more nutritious food could be supplied at the same expense, and therefore the commander in chief was able to supply some bread in place of rice. The results of the experimental use of barley in the Osaka division, and in the navy, induced the army authorities of other divisions to adopt a supply of barley in proportion of three of barley to seven of rice, and the result in 1903, as shown by the table, was a decrease of sickness in general and of beriberi in particular.

The health and efficiency of the army depend upon the care of the individuals, general sanitation, food, clothing, exercise, etc., hence, the following are the chief subjects to be considered:

1. Selection of men at enlistment. This is a most important subject, so that all nations are particularly careful in the selection of new men for their armies. A high standard of physical condition is adopted and all recruits are required to come up to this standard, as nearly as possible. Unless this is done the army is weakened, increasing sick days, hospital accommodations, invalided men, the services of medical officers, etc.; all involving an enormous waste of time and money.

2. Sanitary arrangements: Construction of bar-

racks, quarters, shelters, tents, etc., water supply, drainage, cleanliness of environments are very important but there is no necessity of describing them, as they are too well known. I shall refer to this subject later on.

3. Clothing: It is not necessary to speak about this subject, but I shall show you samples of our army uniforms.

4. Food: The quality, quantity, and methods of supply of food are absolutely important in time of peace or war, so that I say the food must be considered as the first essential subject of military hygiene. I firmly believe that men supplied with a sufficient quantity of food of good quality to keep up a proper nutrition will maintain their strength and efficiency whether they live in unhealthy places or are exposed to inclement weather with a deficiency of clothing and lack of proper shelter. For example, the better state of our navy's health since the year of 1884 is due to improved conditions. Prior to this date our naval men used to suffer much in summer with beriberi and diseases of the gastrointestinal organs. The sickness of the men also increased whenever they had to exert themselves more than usual, say to march for a day or more, thus losing in bodily weight, or when taking a long voyage, or going to tropical regions, or to cold regions such as the northern ports of Corea, where they used to get chilblains of hands, etc. Since the improvements were made in rations these evil effects are not seen. Our men stood the climate during the recent war well in winter as well as in summer. Not only during this war, but also during the Japan-Chinese war twelve years ago, the naval men kept their health excellently; that is, in northern parts of China and Corea as well as in Formosa and adjacent isles.

As to the selection of the men, the construction of ships, barracks, etc., there were no particular changes made with the view of the improvement of

the health in our navy. No doubt certain improvements were possibly made and at the same time the same is common with the other nations. In the ships and barracks, etc., built before 1884, no alterations were made, yet the health of the navy has improved, as stated before, proving that the change in the ration alone has had to do with the improvements of health. With our army, the health of the soldier has improved since the addition of barley to the ration. Again in the recent war, from the month of July, 1904, up to January of 1905, beriberi attacked some parts of our army, but upon the adoption of barley in proportion to the quantity of meat used, uniformly added to the existing three to seven of rice and the uniform increase of meat to the existing rations, a marked diminution of beriberi is said to have followed, decreasing to one third of its previous occurrence.

5. Prevention of contagious or infectious diseases: It is a fact that an outbreak of any contagious or infectious disease weakens the strength of an army, hence the absolute necessity of preventing such, not only in time of war but also in peace. The following are the chief diseases which have been great foes to the navy and army from ancient times: 1. Cholera. 2. Dysentery. 3. Typhoid fever. 4. Beriberi. This has attacked the Japanese navy and army badly for more than thirty-three years. 5. Malaria. 6. Scurvy. 7. Smallpox. 8. Typhus. 9. In addition, yellow fever, measles, scarlatina, cerebrospinal meningitis, venereal diseases, alcoholism, phthisis have been prevalent, but I do not regard these so important as the others.

The recent advancements in medical science have made their pathology clear, so that prevention has become more and more positive or certain. What we have to regard as important, so as to keep the health of force, is to carry on in all its details a proper method adapted to the different varieties of

these preventable diseases. In time of peace and war, every precaution must be taken against intrusion of any such disease as is preventable.

The following rules were insisted on in the army :

1. No man should be allowed to approach the poisons of an infectious disease. 2. A sufficient supply of wholesome water should be guaranteed, thorough drainage, and proper treatment of excreta, etc., must be strictly observed. 3. Clothes and all necessaries to each man should be kept clean so as to avoid conveyance of infections. 4. The quality and quantity of the food and its cooking must receive strict attention, as the chief means of introduction of preventable diseases into the human body is through the food supply.

What are we to do in time of war? We have simply to do what is stated or already mentioned, as far as is practicable. As the army moves its quarters here and there, practical applications of preventive methods are not so easy as in times of peace. When should these be done? In the first place, the medical officers of any army, wherever they go, must ascertain as far as possible the presence or absence of such diseases as are infectious or contagious. Camping must be avoided as much as possible where there is a dangerous disease or any suspicion of an existence of such in any house or place.

When an epidemic disease breaks out the sufferers should be isolated at once, thus preventing its extension or spreading.

For the execution of the second rule the surgeon must ascertain where water is to be obtained and whether or not it is drinkable. When found to be unfit for drinking he must give public notice to this effect ; and, if necessary, he must arrange to keep a guard over the infected source. When the weather is hot, long marches are to be made and troops are fatigued and thirsty, they have no time to think of



danger, therefore, every one must be trained to the boiling of water before drinking it.

There are, it must be remembered, great difficulties, especially at night, in determining whether a given water supply is good, and special precautions should be taken in time of night marching.

For the execution of the third rule clothes, shirts, blankets, etc., must be kept clean and those washable must be washed whenever there is an opportunity of doing so. In the quarters or districts where there is any epidemic disease, all the necessaries must be disinfected or sterilized with special disinfecting apparatus.

For the execution of the fourth rule, the food must be inspected by medical officers before and after cooking, prior to its issue, and at the same time special care must be taken as to the food obtained at any new place. In addition to the general rules already outlined, each individual must take care of himself, therefore the imperial Japanese army was supplied with a text during the recent war and every officer of the line and medical officers have had to instruct soldiers, including inferior officers, explaining the text instructions whenever they thought necessary or found time to do so.

The contents of the instruction under the title:

*Sanitary Instructions in the Field for Inferior Officers and Soldiers*, pertain to: 1. Body. 2. Clothes. 3. Drink and Food. 4. March. 5. Quarters or shelter, etc.; a, shelter; (b) open camp. 6. Prevention of diseases incident to marching; a, chilblain; (b) sunstroke. 7. Prevention of contagious or infectious diseases.

I. *Rules of General Hygiene*.—1. Onychia (swollen finger), boils, toothache, etc., even when slight, disturb the free actions of body and lower the fighting strength of the army. As these are generally caused by carelessness everybody ought not forget to keep himself clean even in war time.

2. As it is generally impossible to have warm bath

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during active service, each soldier should therefore wash himself with cold water often, especially in the axillæ, the inner sides of thighs, and the pubes particularly.

3. The hair of the scalp should be cut short, and washed so as to keep the head clean.

4. Every morning the mouth and teeth should be cleaned as a protection against decaying teeth.

5. Owing to frequent use the hands get dirty easily and in consequence are very liable to become inflamed. Besides, through them the pathogenic organisms may enter and cause trouble. Therefore they should be washed often with soap and water.

6. The feet, like the hands, also get dirty easily. Moreover, they become moist through the boots and give out a peculiar odor, and often produce boot sores. When getting into quarters, therefore, they must be washed. Those who ride should wash the inner side of the thighs and the buttocks so as to prevent saddle sores as much as possible.

7. As the dirt beneath the nails often contains infectious material, they should be cut and cleaned frequently, but they should not be cut too deeply, as such is apt to cause wounds.

8. In winter, when the skin of the hands and feet is rough and fissured, there is always the fear of infection entering, and therefore they should be washed, dried, and treated with suitable ointments.

II. *Clothing.*—1. The chief purpose of dress is to protect against cold, but too much clothing causes sweating and is injurious. During working hours the clothing should be light, but there should be sufficient protection from cold after sweating. During rest, or during sentinel duty or when scouting the body should be protected with various kinds of winter clothing.

2. The overcoat is an indispensable article of winter clothing, as it often serves as a bed. If it gets wet through rain or snow it should be dried immediately upon reaching quarters.

3. Shirts, undernickers, and socks should be washed often and thus kept clean, otherwise the body itself cannot be kept clean.

4. When repairing tears in undernickers the sewing

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seam should not be made irregular—especially for those who ride—because it often causes saddle sores.

5. As an abdominal belt is a good protection against cold, it should be worn regularly when given.

6. The socks should be changed often, as torn or wet socks frequently cause boot sores, chilblains, etc. When too cold with socks alone, the feet should be bound with any linen or woolen cloth (flannel best) and shoes put on.

7. Shoes should be kept soft, because sore feet are caused by not only the bad fit, but also by the hardness of the leather. Oil should be used for the purpose of keeping the leather soft.

8. The method of making hardened shoes soft is as follows: (1) Put them in water or brush with wet brush until they become soft; (2) wipe off the water on the surface and then let the leather absorb soluble lard by applying it under the influence of the sun or stove or bonfire.

9. As the shoes of the infantry are as the horses of the cavalry, they should be well looked after.

10. As it is impossible to escape injury when the shoes become torn they should be carefully mended. Wet shoes should not be suddenly dried, as it is not good for preservation. They should be bound in warm straw or woolen cloths, and should be dried gradually by heat.

11. When the shoes become torn and there are no fresh ones to change, the feet should be bound first with dried grass, straw, etc., and then several times over with cloth, and one should finally wear waraji (Japanese straw shoes).

III. *Food.*—1. The bodily strength is kept up by food, and more food is necessary in times of war than in time of peace. If you don't eat enough you soon get tired and cannot work.

2. In addition you cannot bear cold well and often become ill if you do not eat. Therefore sufficient food ought to be taken, so as to prevent hunger, but over-eating and drinking are injurious.

3. When very tired or very hot, do not take food at once, but wait a short time before doing so.

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4. Auxiliary food of unusual smell or taste should not be eaten.

5. As ripe fruits are good for health and have power to ease thirst, they may be eaten after peeling the skin, but unripe fruits often cause diarrhœa and they should not be taken, especially when dysentery or cholera is prevalent.

6. As fresh vegetables and water often contain poisons they should not be taken in that state.

7. Any kind of water if having been regularly used before may be used, but if possible boil it before drinking.

8. The water in old wells, ponds, or marshes, even when boiled, is dangerous, and it should not be used unless necessary.

9. The food left behind by the enemy, the well water in the district newly captured, or any drinks or eatables among the inhabitants should not be carelessly used, as there is danger of poison having been mixed with it.

10. Tea, coffee, etc., are good tonics for the relief of weariness and tired feeling. Tobacco in small amounts is also good for the same purpose.

11. Wine or alcohol if taken moderately is beneficial and recoups the energy, but in large quantity is very injurious. When there is danger of gangrene or death from cold, sunstroke or fever, it should be forbidden.

IV. *During the March.*—1. On the day before starting the shoes or socks should be well arranged, the body washed and cleaned, the food well chosen, and sufficient sleep taken. If you slept little through drinking bouts, you will soon get tired during march, and moreover liable to suffer more readily from cold and sun.

2. All strings or laces that require tying, or buttons that require fastening should be carefully attended to before starting, because that cannot be easily done during march, owing to the numbness of the hands through cold.

3. Fill the water bottle with either boiled water or tea before starting.

4. During march try to keep regular step, and do not walk with heads down. When climbing hills or marching against the wind do not talk or smoke.

5. Never get out of the column unless compelled to

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by circumstances, because running after in order to catch up with the column tires one excessively.

6. Try to drink as little as possible during the march. The bad habit of drinking water, when thirsty, induces and does not stop thirst.

7. When hot, do not take a large quantity of water at once, because it is injurious and at times causes death. Therefore drink water gradually in small quantities.

8. During the march if you get thirsty do not eat ice or snow, because it only increases the thirst.

9. During rest button up your collar and do not permit the sun to shine directly on the head.

10. Lying down on the wet ground when hot is injurious. Therefore choose dry ground, or sit on the ground after covering it with straw, dead grass, or fallen branches.

11. Always attend to the feet when resting. If there is any sign of redness go to the medical officer and ask for an ointment to rub on them. In addition to the ointment a specially prepared powder may be used.

12. Pay careful attention to the socks. Pull out any wrinkles, and afterwards change from one side to another. If wet put on fresh new ones.

13. In order to recover energy when tired the feet should be rubbed with a wet cloth, and the hands, face, and neck should be washed with cold water.

14. During resting if impossible to obtain good water to ease thirst, keep a pickled plum in the mouth or bite harmless things, like leaves, straw, etc., because they ease thirst for a time.

V. *Houses or Quarters.*—I. *Barracks.*—1. In Corea and China the houses are warmed by heating the floor. If the Japanese charcoal fire pot be used in these houses there is danger of death through poisoning by a carbon monoxide gas.

2. If the stove is damaged and cannot be used the charcoal fire pot may be used, but in that case the windows should be left open all night or new windows might be cut, so that there will be good ventilation.

3. In Corea and China the flies are exceedingly numerous, and coming in contact with food they become the medium of infectious diseases. Special precaution

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should be taken against them. Bedbugs are found almost everywhere, and often disturb the sleep. As they sometimes cause skin disease, some special precautions must be taken, or ask the medical officer to give you medicine to get rid of them.

4. In Corea and China there are no lavatories in the houses, therefore temporary lavatories are generally built at headquarters, but if they cannot be constructed in time, each soldier should dig a hole and after excreting cover it with dry soil, so as to prevent flies from coming in contact with it and becoming the medium of transmission of infectious diseases.

II. *Open Quarters.*—1. If you have to sleep out in a tent always keep the tent open during the day. In warm weather, even at night time, keep several places open in order to let the air in.

2. Straw, dry grass, fallen leaves, etc., used for bed in the tent should be taken out often and dried in the sun.

3. In warm weather the tents may be advantageously arranged in the open method and in cold weather in the closed method. Those not in use should be used for covering the ground to protect against moisture.

4. In winter the feet especially become cold and are liable to get frozen easily; therefore the best way is to wear double or several layers of socks, then cover them with straw, and finally use the overcoat when going to sleep.

5. When snow laden, do not sleep on the ground, because even when hardened it gradually begins to melt, and by wetting the clothes takes away the bodily heat. In consequence, there is danger of gangrene or death from cold. Therefore, always clear the snow off the ground and heap it up around, so as to make a snow bank. Then sleep in it, but the entrance should be made against the wind.

6. Lavatories need the same care as in barracks.

VI. *On March.*—The most fruitful sources of trouble to the soldier on the march are boot sores, cold and thirst. As the first has already been mentioned we shall give some points about the last two now.

A. *Cold.*—1. The common sites of freezing are the

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tips of the fingers, the feet, ears, and nose, that is, the parts lacking sufficient nutrition, owing to poor circulation. Therefore, when on the move during winter pay special attention to these parts. Moreover, before starting, rub the hands and feet with ointment.

2. The radical preventive measures are to wear warm protective winter clothing, to keep up the nutrition and to have sufficient sleep. When the sleep is insufficient, everybody gets easily weary of exercise and low spirited, and when sufficient nutrition has not been taken, the bodily heat is lower and the resisting power is weakened.

3. Alcoholic spirits give temporary warmth to the skin, but lower the general body heat and so aid in freezing and death, consequently alcoholic drinks are to be avoided.

4. Exercise is very important, because it increases body heat. Therefore, even when on guard and standing at one spot, always keep step to time and keep the feet on the move.

5. Massage is a form of local exercise. If you lose feeling in the ear, nose, hands, or feet, you should begin rubbing them at once, as these signs indicate freezing.

6. Head gear, gloves, and socks are protective mediums against cold. If they are torn, they should be mended.

7. Bare hands, especially when moist, should not touch frozen metals, because it causes burns.

8. The feet are particularly to be looked after, owing to the socks becoming wet and freezing to the feet. Therefore the most important preventive measure is to keep water out of the shoes or boots. Pay special attention when crossing a river or walking in the snow. If the socks become wet from water or sweat, change them during rest. The feet are important, and it has been said by a famous ancient warrior that victory rests in the feet.

9. As the head of the penis sometimes becomes frozen take care not to forget to button the trousers after urinating.

10. Chilblains are indicated by cold, pain, and loss of sensation. It is not advisable to apply warmth to

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the affected parts. The best way is to rub with snow, or use a cold wet bandage, and then put on an ointment. If the disease advances, the color of the skin changes and blebs are formed. Even at this stage, the disease can be stopped without progressing to a serious stage, by medical treatment.

11. If any of your comrades fall on the ground after becoming stiff all over the body, and are at the point of death from freezing, try the following measures until the medical officer arrives: (a) First carry the sufferer to a room without fire and take off all his clothes. Then rub the whole body with snow or a cold wet cloth. (b) If you find the limbs becoming soft, while making friction, put them in the water and continue to rub the whole body while pouring hot water slowly on the parts affected. (If there is no vessel in which to place the patient in hot water, try artificial respiration at once.) (c) If the hot water become lukewarm, take the patient out and dry him. Then remove him again into a fireless room on a bed and try artificial respiration. (d) If respiration recovers, give him warm tea and place him in a warm bed.

12. During march in snow, many suffer from snow blindness or snow eye. Therefore avoid looking down and wear dark spectacles or light shade to protect against sunshine.

13. Do not cross a frozen lake with the hands in the pockets, because if you fall in by some chance, you will not be able to use the hands in pocket.

*B. Sunstroke.*—1. This is a dangerous disease occurring frequently during marching in hot weather.

2. Men unaccustomed to marching, or of weak constitution, or after severe exercise or illness, or of insufficient sleep, or of loose habit, or of empty stomach, or liable to thirst, especially of drinking habit, are easy victims to sunstroke.

3. The points to be remembered are as follows: (a) Good living; (b) no drink; (c) do not forget to fill the water bottle, so as to provide for thirst; (d) do not miss either food or sleep; (e) besides, always start early so as to avoid the midday heat, and rest at that time; (f) open the column, lessen the baggage, open the clothing, letting in the air to the chest.



4. The early signs of sunstroke are: (a) Profuse sweating; sweat falling from face in drops, running into eyes and neck, accumulating in epigastric region; (b) the head and skin all over the body become heated; (c) respiration becomes difficult, there is palpitation of the heart, and chest motion is uneasy. If you are in these conditions ask leave to drop out and rest in the shade. Then take a drink of water and open the coat and shirt wide. Next wash the head and wipe the chest with cold water. If you do this you will soon recover.

5. If you go on staggering in spite of these signs the sweat will stop, the skin becomes dry, the saliva will stick in the mouth, the pulse becomes weak, the respiration shallow, and finally you fall into a state of coma. If not treated in time, the man is sure to die.

6. If one falls down in that state treat him as follows till the arrival of a medical officer: (a) Carry him to a shade, giving plenty of fresh air, and take off his coat and trousers. Loosen the shirt and lay him with the upper portion of body raised. Forbid crowding around him. (b) Wash the head, chest, and all over with cold water. Or cover the body with wet cloth, and by pouring water keep it wet. (c) If the respiration is difficult, apply artificial respiration. (d) While applying artificial respiration, a fan should be used all the time. (e) Rub the hands and feet. (f) When he becomes conscious let him drink a large quantity of water.

VII. *Infectious or Contagious Diseases.*—1. The cause of infectious or contagious diseases is not internal, but is due to a poison which always comes from outside, and special care is necessary to protect ourselves. These poisons are very minute organisms, generally not visible, and if they once get into the body and find a suitable spot they grow and develop grave disease, and may finally cause death. From ancient times there have been more deaths from disease than from wounds in war time. The chief instruments of this dreadful result are the infectious diseases. Therefore the sanitary arrangements of the headquarters are very strict, but every individual soldier should pay strict attention to all details.

2. The most common disease attacking the army, both in time of peace and of war, is typhoid fever. The poi-

TABLE I.—NUMBER OF DEATHS AND WOUNDED IN THE WAR OF JAPAN AND RUSSIA, 1904-1905.

Instant death.		Wounded.		Unknown.		Loss.		Total.
Officers and men.	Petty officers and men.	Officers.	Petty officers and men.	Officers.	Petty officers and men.	Officers.	Petty officers and men.	
1,657	41,562	5,307	148,366	53	5,028	7,017	194,956	201,973

Subofficers are here included with the officers. The table was made from the reports received until June 30, 1905, concerning troops in Manchuria, and till the end of August, 1905, concerning troops in Corea and Sakhalin. The proportion of instant deaths of officers is 1 to 3.25 and that of petty officers and men is 1 to 3.56. The table shows that the officers died instantly in a larger proportion than petty officers and men. The proportion of death, including both instant and subsequent death, is 1 to 3.94. (The number of deaths are 1,522.)

TABLE II.—NUMBER OF PATIENTS TAKEN INTO THE FIELD HOSPITALS FROM THE BEGINNING OF THE WAR UNTIL AUGUST 31, 1905.

Wounded.		Accidents.		Infectious or contagious diseases.		General diseases.		Total.
New cases.	Dead.	New cases.	Dead.	New cases.	Dead.	New cases.	Dead.	
146,813	15,018	8,304	4,147	17,866	2,044	203,270	6,850	44,272

The above table may have to be corrected afterward. The proportion of death from infectious and general diseases (the total number, 12,811) to that of death from wounds is 1 to 4.

TABLE III.—THE TABLE OF TERMINATIONS OF THE PATIENTS TRANSPORTED FROM THE FIELD TO THE INTERIOR.

Classification.	Officers, Infectious or contagious.		Subofficers, Infectious or contagious.		Petty officers and men, Infectious or contagious.		Noncombatants, Infectious or contagious.		Total.
	Wounded.	cases.	Wounded.	cases.	Wounded.	cases.	Wounded.	cases.	
Cured	1,097	930	287	1	50,690	460	73,327	64	15,484
Invalid	3	10	2	1	11,355	4,113	4,113	1	3,601
Death	26	18	3	3	935	2,125	57,207	51	25,938
Miscellaneous	1,089	801	346	167	36,941	1,095	14,790	3	
Remains	137	178	27	51	9,604	42			
Totals	2,352	1,937	665	4	109,525	1,908	151,562	119	12,782

REMARKS.—This table is made referring to the reports received from the beginning of the war till the end of August, 1905. The miscellaneous includes those cases sent back to their own homes and discharged from other circumstances. This table may have to be corrected later. The total number of patients transported back from the field to the interior is 281,587. The proportion of the wounded to that of infectious and general diseases with accidents is 100 to 150.

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son enters the body chiefly through the food, and therefore do not eat uncooked food or drink unboiled water. This is most important. As poison is sometimes introduced into the body with the food through the mouth, to which it is conveyed by the fingers, the hands should always be washed before food is taken.

3. The poisons of dysentery and cholera are also introduced through food, and require similar treatment as typhoid. As unripe fruits cause diarrhœa, do not eat them.

4. As smallpox still prevails in China and Corea, do not go anywhere near the infected houses even if you have been vaccinated.

5. The pest generally enters the body through a small wound. So if there is any sign of pest epidemic always go to a medical officer even if the wound is slight. Moreover, you must not walk in bare feet and must keep the gloves on. As rats or flies are the chief causes of this disease try to get rid of them as well as possible, and let them not touch the food.

TABLE IV.--NUMBER OF NEW CASES IN SUMMER MONTHS.

	June. Per cent.	July. Per cent.	August. Per cent.	September. Per cent.
1904-1905, the whole army	7.63	8.70	7.92	5.63
1903, in peace.....	11.06	13.66	13.91	11.55

6. Malaria is introduced by mosquitoes. Therefore always keep them off by the mosquito net or other methods.

7. Gonorrhœa, syphilis, etc. These diseases are caused by coming in contact with women suffering from them. Therefore keep in mind that the Chinese and Corean loose women are all infected, and do not touch them. If you do, you will not only invite calamity with shame to yourself, but leave unending trouble to your descendants.

8. Among the infectious eye diseases the most important is the infectious conjunctivitis. This is introduced through using a common washing basin, towels, etc. Therefore when this disease prevails avoid using the same utensils as others use, but if there are no available vessels, wash them several times with clean water before using. Another disease to be careful

TABLE V.—NUMBER OF INFECTIOUS AND BERIBERI PATIENTS FROM THE BEGINNING OF THE WAR IN 1904 TO THE LAST DAY OF AUGUST, 1905.

	Smallpox.	Scarlet fever.	Typhus.	Diphtheria.	Typhoid fever.	Dysentery.	Beriberi.
	New cases.	New cases.	New cases.	New cases.	New cases.	New cases.	New cases.
Totals	347	10	51	9	9,722	7,642	97,572
	33	2	11	1	4,073	1,804	3,956

This table may also have to be corrected afterward.

*Takaki: Military Hygiene.*

about is the gonorrhœa, because the eyes are often attacked through touching them by infected hands.

TABLE VI.—COMPARATIVE TABLE OF INFECTIOUS DISEASES PER 1,000 OF MEN.

	Cholera.		Typhoid fever.		Dysentery.		Malaria.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Japan-China war . . . . .	82.77	50.86	37.14	10.98	108.96	15.72	102.58	5.29
North China trouble . . . . .	...	...	36.42	12.14	108.71	33.65	95.61	2.20
Japan-Russo war . . . . .	...	...	9.26	5.16	10.52	2.68	1.96	0.07

This table is made with the reports received from the beginning of the war till the last day of May, 1905, and may also have to be corrected later.

TABLE VII.—TABLE OF THE MEDICAL OFFICERS OF THE ARMY OF JAPAN.

Ranks.	November 10, 1905.			Total.
	Active.	Reserve.	Retired.	
Surgeon, lieutenant general . . .	1	3	..	4
Surgeon, major general . . . . .	7	2	2	14
Surgeon, colonel . . . . .	37	5	3	45
Surgeon, lieutenant colonel . . . .	43	6	5	54
Surgeon, major . . . . .	176	29	19	224
Surgeon, lieutenant . . . . .	443	78	74	595
Surgeon, lieutenant, junior . . . .	232	866	110	1,208
Surgeon, second lieutenant . . . .	234	2,076	6	2,316
Probational surgeons . . . . .	38	..	..	38
<b>Totals . . . . .</b>	<b>1,211</b>	<b>3,065</b>	<b>219</b>	<b>4,495</b>
Pharmacists:				
First-class inspector . . . . .	1	..	..	1
Second-class inspector . . . . .	2	..	..	2
Third-class inspector . . . . .	8	4	1	13
First-class pharmacist . . . . .	53	7	5	65
Second-class pharmacist . . . . .	30	72	9	111
Third-class pharmacist . . . . .	16	428	2	446
<b>Totals . . . . .</b>	<b>109</b>	<b>511</b>	<b>17</b>	<b>637</b>
<b>Grand totals . . . . .</b>	<b>1,320</b>	<b>3,576</b>	<b>236</b>	<b>5,132</b>

TABLE VIII.—TABLE OF DEATH AND WOUNDED OF THE MEDICAL OFFICERS DURING THE WAR.

Ranks.	Deaths.	Wounded.
Surgeon colonel . . . . .	1	69
Surgeon lieutenant . . . . .	2	
Surgeon lieutenant junior . . . . .	6	
Surgeon second lieutenant . . . . .	9	
<b>Total . . . . .</b>	<b>18</b>	

*General Remarks.*—During the recent war we had to take the strictest precautions to keep our men free from epidemic disease by the execution of various plans devised at the beginning of the war. For

instance, as to the supply of water, we had to provide water carriers drawn by four horses, water boiler cart drawn by one horse, and boiled water stations as well as a small provision pan; thus a soldier can have boiled water by boiling it with his own pan when he finds the necessity of doing so. At the boiling water station during the march, the soldiers had to fill their own canteens with boiled water. During the march, when they exhausted their own canteens, they had to get water from the water boiler car which always accompanied the troops, and the water carriers were almost always with them. When they had to get water from a stream or river, they were ordered to get the drinking water from the centre of the stream so as to avoid the impurities coming from the bank of the rivers; even then the water had to be boiled before they took it. From experience they found it difficult to know whether water which they got during the night was pure or dirty, as the light was not sufficient. Therefore we had to take great precautions during the night march.

*Food.*—Almost all foods were sent from the interior to the front under strict superintendence of officers in ranks, but of course whenever fresh food could be obtained keen precautions were taken not to get any injurious materials from the natives, because there was some danger of poison being mixed with the food, and thus we tried our best to give them fresh food as much as possible. During severe winter the soldiers were required to keep their provision box wrapped with a piece of flannel and keep it under the overcoat, so as to prevent its freezing. They were ordered also to cook their rice each time they had to eat, according to the circumstances, and also at times they had biscuit in place of rice and barley. During the hottest part of summer they added a small quantity of acetic acid to the rice and barley cooked in order to prevent de-

composition. In addition to a regular supply of food material, the soldiers were allowed to buy eatables according to special regulations laid down prohibiting them from buying directly from the natives. Sake was allowed to each of them in average of two ounces as an extra, under strict superintendence of the medical officers. Sweets were allowed to those who had no inclination to drink sake.

*Camping.*—As to camping on the march, a so called camping party, consisting of the line and medical officers, was sent ahead so as to see if the camping place could be made safe from the strategical as well as the sanitary point of view. Medical officers had to inspect the source of water supply, the conditions of houses found there, and the people living therein. When medical officers found any water which was unfit to drink, they put up a notice cautioning the troops not to take it, and in special cases where there was great liability for the soldiers to drink the water a guard was kept on the polluted water supply.

The natives had to be inspected in order to determine if they were suffering from any preventable disease, and if it was found that they had such, they were removed to special quarters, where they could be cared for by the medical officers. As to the peasants' houses which might be used for quarters, these were cleaned from corner to corner and disinfected, and the grounds about the houses as well as those outside the camping tents were cleaned and disinfected. Afterwards the medical officers cleaned daily and burned all the combustible refuse by fire or buried the same. Excrements were treated in the same way as the others.

Considerable trouble with flies had to be overcome. At the beginning various methods for killing flies were devised, but they were so numerous that the army was practically overwhelmed by their

invasions. It was soon found that they lay their eggs in manure as well as in refuse, and now all the manure was burned as quickly as possible, and in this manner we have been able to diminish the number of flies.

*Clothes.*—In addition to washing the clothing as often as opportunities permitted, disinfecting apparatus with which the clothes, etc., belonging to each soldier could be disinfected or sterilized were put in operation. Each apparatus had a capacity of disinfecting for twenty men at one time and more than one hundred apparatus were utilized. I believe that they were a very useful means of preventing the spread of epidemic disease.

*Sending the Troops to the Front.*—Before the troops were sent out to the field they were made to undergo strict inspection by medical officers to see whether there was danger of any form of epidemic disease being amongst them. When such were found they were all disinfected and sent out.

As to transportation of troops from the front back to the interior, all the troops had to be disinfected at quarantine stations and then were allowed to land. Three quarantine stations, the principal of which is that of Ninoshima, where they disinfected 6,000 men in the course of twenty-four hours when in active use. Both steam sterilization and use of formalin with steam, of which I do not think there is any necessity of description because they are all the same as you find in your own quarantine stations.

All transport ships were thoroughly cleaned and disinfected each time they came back to the ports, and the interior of them were cleansed and disinfected with steam, etc.

*Treatment of Wounds.*—Our army surgeons were in favor of conservative surgery and all wounds were treated aseptically as far as possible. In a great many cases the wounds were healed by the end of a week or ten days without having to change the



first dressing. Major operations were avoided as much as possible in the front. Of course, after transportation to the interior such operations were performed according to the nature of the wounds. The medical officers applied various means in the treatment of the wounded in the front, according to their nature, but, after all, aseptic surgery was the principal object. As to the results and terminations of all the cases treated we are not yet in position to inform you, because such a large number of troops and medical officers were employed, and consequently the reports which have to be made from the front army corps had not arrived at the time when I obtained the reports which I have here given you. As one example of the results and terminations of treatment, I give you a short account of the hospital established in Hiroshima.

The hospital was established in April of 1904 and the report covers the time up to November 30, 1905. During this interval the hospital admitted 203,782 cases, whence 162,885 were transferred to other hospitals, but the average number of patients in the hospital was about 5,000 and the largest number the hospital had at a time was 10,000. Almost all serious cases were kept in the hospital because they were unfit for transportation, yet the result was so good that the ratio of death and invalided is a little above one per cent. Almost all the wounds of the soft tissues healed within ten days; those with injuries to the bones have obtained favorable results excepting those who were wounded at the siege of Port Arthur. The many men who were wounded in the head and chest have recovered from the wounds received, and there were also many cases of aneurysmal varix, wounds of nerves, requiring operations. The number of operations performed at the hospital amounted to more than 3,500.







