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U. S. NAVAL TECHNICAL MISSION TO JAPAN
CARE OF FLEET POST OFFICE
SAN FRANCISCO, CALIFORNIA

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RESTRICTED

From: Chief, Naval Technical Mission to Japan.
To : Chief of Naval Operations.

Subject: Target Report - Bacteriology and Chemistry in the Japanese Navy.

Reference: (a)"Intelligence Targets Japan" (DNI) of 4 Sept. 1945.

1. Subject report, covering Target M-10 of Fascicle M-1 of reference (a), is submitted herewith.

2. The investigation of the target and the target report were accomplished by Comdr. P.B. Ayres, (MC) USNR, assisted by Lieut. P.E. Arioli, (MC) USNR, Lieut. W.W. Woodworth, USNR, Lt.(jg) F.J. Gilbert, USNR, and Lt.(jg) R.M. Hendrickson, USNR.

C. G. GRIMES
Captain, USN

30628

BACTERIOLOGY AND CHEMISTRY IN THE JAPANESE NAVY

"INTELLIGENCE TARGETS JAPAN" (DNI) OF 4 SEPT. 1945

FASCICLE M-1, TARGET M-10

NOVEMBER 1945

U.S. NAVAL TECHNICAL MISSION TO JAPAN

SUMMARY

MEDICAL TARGETS

BACTERIOLOGY AND CHEMISTRY IN THE JAPANESE NAVY

Questioning of Japanese naval medical personnel on the specific items requested in this target elicited negative answers. The Army Technical Medical Mission was able to contact several civilian institutions which had some research work on these subjects. The titles of papers they found are appended (Reference "C"). Work of any value for this particular target came chiefly from the Government Infectious Disease Research Institute, located in TOKYO, with Dr. MIYAGAWA in charge, which target the Army likewise has well exploited.

The information recorded in this report may be of some value, in that it is revealing, even though of a negative character.

Bacteriology in the Navy during the recent years had been of a very restricted nature. Diagnostic work was limited to the minimum necessary for physico-chemical analysis, and "infectious disease" laboratory procedures.

A few reports on research projects have been included in the references.

TABLE OF CONTENTS

REFERENCES

A. Japanese Personnel Who Assisted in Gathering or Locating Equipment and/or Documents:

None.

B. Japanese Personnel Interrogated:

1. The entire roster listed under Reference B of "Data Relative to Life in the Jungle and On Sea Islands, and Data on Composition of Insecticides", NavTechJap Report, Index No. M-01.

2. Capt. MURAKAMI, (MC) IJN, Pathologist, Tokyo Naval Medical School.

3. Lt. Comdr. YONEGAWA, (MC) IJN, Dermatologist, Tokyo Naval Medical School.

4. Vice Admiral YASUYAMA, (MC) IJN, Bacteriologist, CO of Omura Naval Hospital.

5. Lt. Comdr. T. TAKASHI, (MC) IJN, Bacteriologist, Sasebo Naval Hospital.

C. Reports of Other Investigating Committees:

1. "Periodic Reports on the Activities of the Committee for the Technical and Scientific Investigation of Japanese Activities in Medical Science" - Chief Surgeon's Office, GHQ, AFPAC (Advance Echelon).

2. Report of the U.S. Typhus Commission in Japan - files of the U.S. Typhus Commission, Washington, D.C.

3. Report of the Commission for the Investigation of Schistosomiasis - files as in 1. above.

4. Reports of the Public Health and Welfare Section of the GHQ, SCAP, AFPAC.

LIST OF ENCLOSURES

(A) List of Data Relating to This Target Gathered by Other Agencies.

(B) List of Documents Forwarded to NMRI, Bethesda, Md.

(C) List of Documents Forwarded to WDC Through ATIS

(D) List of Drugs Forwarded to NMRI, Bethesda, Md.

INTRODUCTION

The following information is listed in "Organization, Administration, and Facilities of the IJN Medical Corps," NavTechJap Report, Index No. M-AA, in the section on the training of Japanese Medical Officers:

"Training for advanced (medical) students.

"4. Naval Immunization - wartime and peacetime immunization methods for the fleet including essential microbiology and serology.

"5. Naval Pathology - The study of both common and exotic diseases in the Navy.

"8. Naval Medical Chemistry - Medical chemistry including billeting, food, clothing, detection of poison gas, gas decontamination...

"9. Endemic Diseases in the Navy - Study of domestic and foreign endemic diseases, particularly those found in ports."

This course covered six months, and from the titles would indicate a very adequate coverage of the subjects. Actually, it has proved that these were condensed and limited refresher courses of what the medical officer had studied in medical school. Practically no patient-material was available for demonstration, lectures and laboratory demonstration taking up most of the allotted time. The specialist's post-graduate training was as follows:

"1. Naval Immunology - Training methods, fundamentals of bacteriology, serology and parasitology.

"2. Epidemiology in the Navy - General outline of domestic and foreign diseases.

"3. Pathological Testing - Bacteriological and blood testing."

Again a six-months course, in which these subjects were included, was given. The so-called Medical Chemistry was a mixture of chemical warfare and food sanitation and inspection. With this for background, it should also be remembered that a great deal of what was taught at the Japanese Naval Medical School in TOKYO was quite sound. The indications are, however, that the medical officers found the standards of practice lower than those of instructions, the actual procedures being conducted on a much lower plane than their level of knowledge, as of graduation.

The naval medical officers, hence, that were most qualified in these subjects were the younger men, recent graduates of the medical school. Almost all of these have been sent overseas or had been given duty afloat, and could not be contacted.

THE REPORT

1. "Phages" - It was reported that one phage had been used and was in use for the diagnosis of the bacillary dysenteries. No samples were discovered in any of the hospital pharmacies, drug supply depots, or dispensaries. A liquid, described in "Rehabilitation in the Japanese Navy", NavTechJap Report, Index No. M-E, may have been of such nature.

The nearest preparation to a "penicillin" was "grunogen fluid," documents on the preparation and use of which are referenced in Reference "D" of this report.

2. No special directives besides those contained in the sanitary regulations had been issued in respect to ventilation. A project was under way in the Sasebo Naval Hospital to study the problem of air-borne bacteria, cross infection and its relation to ventilation, but no results had been reached, and very little had been done before the hospital was partially destroyed by fire from an air raid.

3. The grouping of streptococci, clostridia, etc., and their identification was done in rather elementary fashion as far as actual practice was concerned. The identification was by growth and cultural characteristics and morphology. When the available culture media are listed one reason becomes apparent. In the naval hospitals the following media were found:

a. Plain broth
b. Peptone broth
c. Blood broth (could be prepared but was seldom used)
d. Plain agar
e. Blood agar
f. Laeffler's agar slants
g. Endose plates
h. Six fermenting sugars (usually in agar slants) for identification of the B. coli and lactose fermenting pathogens.

Other media were not available, unfamiliar, or "impractical."

Occasionally a guinea pig inoculation for Tbc. was done. Even potato was not used for cultures. As reported, no pneumonia typing or culturing was done. Neisser's bacillus was not cultured.

In serology, variations of the Wasserman and Kahn, Widals', blood typing, and a few serum agglutinations comprised all the procedures. Hence no sub-grouping of streptococci were possible. Staphylococci were "albus" or "aureus." Pyocyaneus was commonly reported, and the gram negative intestinal rods tested against fermentation.

Meningococcus culture was not done, few colorimetric determinations could be carried out, and although sedimentation rates were part of the routine, serum albumin and protein, blood chlorides, and other blood chemistries were rarely ordered or performed.

These "advanced techniques" were practised in the Tokyo Naval Medical School, in the Imperial University Medical Schools and in the larger Medical Colleges. A few of the larger hospitals such as YOKOSUKA and KURE, had a few more laboratory procedures in bacteriology as routines, than the rest.

The naval medical officers for the most part seemed satisfied that the laboratory examinations were adequate, and regarded the advanced techniques as unnecessary refinements. They could not be carried out in any case, as has been noted, due to the scarcity of culture media materials, the lack of adequately trained technicians, and the urgency of the routine work, so crowded were they with casualties.

4. The Medical Corps Bacteriologists had not been approached by any agency regarding the deterioration of oil in storage tanks from bacterial action. No shore-based line officer had any knowledge of such a condition, or any conception of its possibility.

5. Synthetic anti-biotics had not been prepared, nor did the Navy Medical Corps have any research underway along these lines.

6. The use of ultracentrifuges and electropharesis was a matter of academic acquaintance only. It was believed that in research laboratories such methods were in use, but no biological house was known to be producing biologicals by such methods, and the Navy certainly was not.

The discrepancy between the techniques taught and the information disseminated from the Naval Medical School and those in use in the practice of naval medicine, seemed to be about equal to the difference between the most advanced Medical Schools (in certain universities) and the Naval Medical School. Civilian medical professors, research workers, their techniques and equipment for laboratory research and their progress, were on a higher professional plane, and at more advanced levels than the military. The various reports referenced in Reference "C" of this report, and the estimates of the Army Committee which made the investigation bear out this contention in most instances.

On the various points noted in this report, and adequate survey of civilian practices and research might well contribute more valuable and interesting data, i.e. see item 1, Reference "C" of this report.

A table of various serums and vaccines in use in the Navy follows under Table I. Table II shows those actually produced by the Navy. Table III notes civilian-produced vaccines with comments, chiefly obtained from the "Institute for Infectious Diseases," TOKYO, Japan.

TABLE I
TABLE OF VARIOUS SERUMS AND VACCINES

ITEM	REMARKS	EFFECTIVE TIME
Smallpox Vaccine	1 supply (for 5 persons)	2 months
Refined Smallpox #2	1 adult 0.5 milligrams	1 month
Refined Smallpox #3	child (6 adults) 3 milligrams	1 month
Liquid Diphtheria Serum #3	1,500 immunity units 3 milligrams	1 year
Strong A Liquid Diphtheria Serum #2	6,000 immunity units 5 milligrams	1 year
Strong A Liquid Diphtheria Serum #3	12,000 immunity units 10 milligrams	1 year
Strong B Diphtheria Serum #2	5,000 immunity units 5 milligrams	1 year
Strong B Diphtheira Serum #3	10,000 immunity units 10 milligrams	1 year
Liquid Tetanus Serum #1	6,000 immunity units 10 milligrams	1 year
Liquid Tetanus Serum #2	24,000 immunity units 40 milligrams	1 year

TABLE 1 (Continued)

ITEM	REMARKS	EFFECTIVE TIME
Liquid Tetanus Strong Serum #2	20,000 immunity units	
	20 milligrams	1 year
Enteric Fever Serum	20 milligrams	1 year
Dysentery Serum (Dr. TAKA) #1	10 milligrams	1 year
Dysentery Serum (Dr. TAKA) #2	20 milligrams	1 year
Dysentery Serum (SHIGA) #1	10,000 immunity units	
	10 milligrams	1 year
Dysentery Serum (SHIGA) #2	20,000 immunity units	
	20 milligrams	1 year
Cholera Serum	40 milligrams	1 year
Drinking Spoon (飲匙 IN SHI)		
Snake Venom Serum	40 milligrams	1 year
Streptococcus Serum #1	20 milligrams	1 year
Streptococcus Serum #2	40 milligrams	1 year
Staphilococcus poison-resistant serum A type #2	20 milligrams	1 year
A-type Staphilococcus poison-resistant serum	40 milligrams	1 year
B-type (Strong) Staphilococcus poison-resistant serum #2	50 milligrams (10 tubes of 5 mg each)	1 year
Epidemic Cerebro-Spinal Meningitis Serum	20 milligrams	1 year
Pneumonia double germ Serum	20 milligrams	1 year
Jaundice haemorrhage Sperochete Serum	20 milligrams	1 year
Mixed serum - colon germ and gas ulcer germ #1	20 milligrams	1 year
Mixed serum - colon germ and gas ulcer germ #2	40 milligrams	1 year
Gas ulcer germ serum #1	20 milligrams	1 year
Gas ulcer germ serum #2	40 milligrams	1 year
Diphtheria prevention liquid #2	20 milligrams	
	10 persons	1 year
Tetanus preventive liquid for horses #1	100 milligrams	1 year
Anthrax Serum	40 milligrams*	1 year
Tuberculin (old)	3 milligrams	1 year
Enteric fever diagnosis liquid	20 milligrams	3 months
Paratyphus A-type diagnosis liquid	20 milligrams	3 months
Paratyphus B-type diagnosis liquid	40 milligrams	3 months
Diphtheria toxin liquid #2	5 milligrams	6 months
Diphtheria toxin liquid #3	10 milligrams	6 months
Old Tuberculin Dilute liquid #2	50 persons	6 months
Old Tuberculin Dilute liquid #3	100 persons	6 months
Syphilis diagnosis liquid	10 milligrams	Several years
Refined Staphilococcus (toxoid) #2	12.5 milligrams	
	5 persons	1 year
Tetanus prevention liquid #2 for horses	500 milligrams	1 year
Refined Streptococcus (toxoid) #2	20 milligrams	
	10 persons	1 year
Erysipelatous streptococcus vaccine	5 milligrams	3 months
Pertussi's vaccine #2	10 milligrams	3 months
Gonococcus vaccine #2	20 milligrams	3 months
Soft Chancre Vaccine	0.5 mg 2 tubes	
	1 mg 10 tubes	6 months
Enteric fever vaccine	40 mg 13 persons	3 months
Paratyphus A vaccine	40 mg 13 persons	3 months

* Limited to Physician's request for treatment and prevention

TABLE 1 (Continued)

ITEM	REMARKS	EFFECTIVE TIME
Paratyphus B vaccine	40 mg 13 persons	3 months
Paratyphus Mixed Vaccine	40 mg 13 persons	3 months
Enteric Fever - Paratyphus Mixed Vaccine	40 mg 13 persons	3 months
Dysentery Vaccine	40 mg 30 persons	3 months
Dysentery (Children's dysentery)	40 children	
Internal Vaccine #3	20 adults	
	120 pills	1 year
Cholera Vaccine	40 mg 13 persons	3 months
Plague Vaccine	40 mg 13 persons	3 months
Influenza - Pneumonia double germ mixed vaccine	40 mg 13 persons	3 months
Jaundice haemorrhage spirochete vaccine	40 mg 13 persons	3 months
Rabies Vaccine #1 for dogs	5 milligrams	
	1 animal	1 month
Rabies Vaccine #2 for dogs	50 mg 10 animals	1 month
Rabies Vaccine #3 for dogs	520 mg 50 animals	1 month

TABLE II

VACCINES

1. Epidemic Meningetis - Immunization vaccine.

2. Cholera - plain agar growth, heat-killer washings. Immunization dose 0.5 cc, 1st dose 1.0 cc, seven days later 2nd dose.

3. Typhoid Triple Vaccine - agar culture, killed bacterial emulsion at 56° C heat.

   a. Para A - 0.5mg % per 1 cc vaccine
   b. Para B - 0.5mg % per 1 cc vaccine
   c. Typhoid -0.7mg % per 1 cc vaccine

   Dosage - 0.5 cc initially, followed in seven days by 1.0 cc. Repeated every six months routinely.

4. Diphtheria

   a. T.A.T. Ramon
   b. Toxoid

SERUMS

1. Standard Blood Group Typing sera - Diagnostic.

2. Plasma - Dehydrated, from whole blood.

TABLE III

VACCINES

1. See Table I for all serums and vaccines not in Table II or below.

2. Typhus - emulsion of infected mouse lung. No proven value as yet.

3. Bacillary Dysentary

   a. Oral vaccine, not satisfactory.
   b. Agar grown, formolin killed emulsion of "Shiga" strain gave poor results prophylactically.
   c. "New strain" cultivated on agar dissolved in chloroform. Still experimental.

4. Dengue - infected mouse brain emulsion attenuated by ultra-violet ray gave "fair" prophylactic results.

SERUM

1. Japanese "B" Encephalitis - convalescent serum for therapy.

"PHAGES"

1. "Shiga" Bacillary Phage used in diagnostic laboratory procedures.

ENCLOSURE (A)

LIST OF DATA RELATING TO THIS TARGET
GATHERED BY OTHER AGENCIES

A. Files of USA Typhus Commission - Brig. Gen. A. Bayne-Jones, USA, Director.

1. Typhus statistics in Japan 1915-1945.
2. Endemic centers (14 Oct. 1945 Memorandum headed "Recommendation for prevention and control of typhus in the home islands of JAPAN for the year 1945-1946).
3. Typhus in Japan and Korea - General comments from Japanese doctors - 8 Oct. 1945 Memorandum headed "Conference with Japanese on incidence and distribution of Typhus in Japan and Korea."
4. Report of Typhus Survey in Korea dated 27 Oct. 1945.
5. Typhus incidence in Korea in 1944, 1945.
6. Communicable diseases in Korea for 1945.

B. Pertinent Articles in Reports (Ref. C-1 this report).

1. Leishmaniasis - transmission and treatment - ASO
2. NIIGATA Antiserum for clostridial group - AON
3. NIIGATA clostridial classification - AON
4. Cataphoresis in virus and rickettsial diseases for obtaining antigenic fractions SAPPORO, AON
5. Electronic Microscope NRC - TOKYO AON
6. List of Biologicals used and studied, Infectious Disease Institute, ASO, TOKYO
7. Strains used in Typhoid-Paratyphoid Vaccine Preparation Infectious Disease Institute, TOKYO, ASO
8. Strains used in Dysentery Baccili classification Infectious Disease Institute, TOKYO ASO
9. New Salmonella strains, Infectious Disease Institute, TOKYO, ASO
10. List of Army Medical College Biologicals, TOKYO, ASO
11. New synthetic drug "KOHA" OKUBA Army Expt. Station, TOKYO - ASO
12. Expts. with dry plasma, sera and bact. toxins Dr. MIYAGAWA, Infectious Disease Institute, TOKYO - ASO
13. Fat powder colloids in malnutrition (Intravenous). Infectious Disease Institute, TOKYO - ASO
14. Powder colloid of Bacteria and antigenetic properties Dr. MIYAGAWA Infectious Disease Institute, TOKYO - ASO
15. New drug "Communin" for treatment of pyogenic infection Dr. OGATA, Infectious Disease Institute, TOKYO - ASO
16. Strains Used for Preparation of Typhoid and Paratyphoid Vaccine (Appendix A, Part I, ASO)
17. Salmonella Classification (Appendix A, Part I, ASO)
18. Army Colloidal Dispersion of Metals
19. Methods for Preservation at Room Temperature of Biological Materials (serum, plasma, red blood cells, bacteria, viruses, etc.)
20. Mouse Fixed Dengue Strains of Virus
21. Dengue Vaccine
22. Mouse Fixed Infectious Hepatitis Virus
23. Japanese "B" Vaccine
24. Communin
25. "BCG" Vaccination on a Large Scale
26. Penicillin Research Committee
27. An Inventory of Samples of Sera, Vaccines and other Biologicals taken from the Army Medical Section, Mfg. Division, NIIGATA (Col. MOORE).

ENCLOSURE (B)

LIST OF DOCUMENTS FORWARDED TO NMRI, BETHESDA, MD.

ND 10-7501.8 Annex #2 on Training

1. Methods of cultivating greenogen and clinical use of its basic fluid (T.N. Penicillin?) - Lt. Comdr. (MC) HASHIMOTO.
2. External use of greenogen fluid - Lt. Comdr. (MC) HAYAKAWA.
3. Utility value of greenogen - Lt. Comdr. (MC) KIMOTO
4. Criticism of the plan of classification of dysentery strains as proposed by the Japanese Science Society and the plan of classification of dysentery germs used by the Navy - Capt. (MC) KAWAI, Lt. Comdr. (MC) MATSUBARA.

ENCLOSURE (C)

LIST OF DOCUMENTS FORWARDED TO WDC THROUGH ATIS

NavTechJap Document No.		Atis Document No.
ND 21-7517-M10	Advanced Bacteriological Instructions	3112

ENCLOSURE (D)

LIST OF DRUGS FORWARDED TO NMRI, BETHESDA, MD.

NAVTECHJAP EQUIPMENT NO.	COMPONENTS
JE21-75-5	Weil's Disease Serum Anti-Tetanic Serum Anti-Dephtheria Serum Desiccated Typhus Immune Serum Paratyphoid B Diagnostic Solution Dried Plasma
JE21-7507	Murata's Syphilis Diagnostic Idechigen Otolysin
JE21-7511	Yiyoda Microscope Medium
JE21-7520	Yiyoda Microscope Small
JE21-7521	Olympus Microscope Large
JE21-7522	Yiyoda Microscope Large
JE21-7525	Anti-Strep. Serum No. 1 Anti-Strep. Serum for Scarlet Fever No. 2 Anti-Strep. Serum for Scarlet Fever No. A Dried Agar Medium Dried Bouillon Kaufman Medium Pills Litmus Milk Pills "Aronzon" Milk Medium Pills "Rassem" Milk Medium Pills "Andorade" Milk Medium Pills