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

1 November 1946

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

Subject: History of U.S. Naval Technical Mission to Japan.

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

Enclosure: (A) Historical Narrative of U.S. Naval Technical Mission to Japan.

1. Enclosure (A), an historical narrative outlining the activities of the U.S. Naval Technical Mission to Japan during the period 1 September 1945 to 1 November 1946, is submitted herewith.

2. The report describes the organization and methods used in accomplishing the objectives assigned by reference (a).

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ENCLOSURE (A)

HISTORICAL NARRATIVE OF
U.S. NAVAL TECHNICAL MISSION TO JAPAN

INTRODUCTION

In the summer of 1945, when the tremendous momentum of our drive was rolling up the islands of the Pacific and bringing imminent the invasion of the Japanese homeland itself, the United States Navy established a mission to determine the position of the Japanese in the field of naval technology.

How did the design and construction of their warships compare with ours? What range and power had their guns? How heavy was their armor and what was its metallurgy? Were they ahead of us in electronics development? The Navy wanted the answers to these and a thousand other technical questions.

To obtain the desired information, investigators had to enter Japan with the occupation forces, before manufacturing plants, equipment, materials and records could be destroyed and experienced personnel dispersed.

NavTechJap, which became the abbreviated designation for the U.S. Naval Technical Mission to Japan, was established on 14 August 1945 by directive of Commander in Chief and Chief of Naval Operations. The formation of the Mission was in accordance with the provisions of the intelligence appendix contained in the plans for OPERATION BLACKLIST, which provided for the occupation of Japan. Capt. C. G. Grimes, USN, who was Fleet Intelligence Officer in Charge of Technical Intelligence for Joint Intelligence Center Pacific Ocean Areas (JICPOA), was designated Chief of the Mission.

The surrender of the Japanese in mid-August required that the basic organization be equipped and prepared to leave Pearl Harbor by 1 September 1945, approximately two weeks after the directive establishing the Mission had been issued, in order to obtain the advantages of early exploitation of targets. The nucleus of the initial organization was recruited from technical and language personnel attached to JICPOA and technical personnel flown to Pearl Harbor from various continental naval activities. This group was designated JICPOA Team No. 29 and consisted of approximately 105 officers and 84 enlisted men. It sailed from Pearl Harbor on 1 September 1945 aboard USS SHELBY (APA 105) and was part of the convoy which entered SASEBO Naval Harbor on 23 September 1945 - the initial occupation in KYUSHU.

Another group, somewhat smaller than Team 29, was organized and designated JICPOA Team No. 30. This group joined the Third Amphibious Corps in the occupation of certain areas in China. Elements of the Intelligence Groups of Commander Seventh Fleet joined at SASEBO, and on 28 September all units were consolidated as NavTechJap.

PURPOSE OF THE MISSION

The purpose of the Mission was to survey all Japanese scientific and technological developments of interest to the Navy and Marine Corps in the Japanese Islands of KYUSHU, SHIKOKU, HONSHU, HOKKAIDO; in China; and in Korea south of latitude 38°N. This involved the seizure of intelligence material, its examination and study, the interrogation of personnel, and, finally, the preparation of reports which would appraise the technological status of the Japanese Navy and Japanese industry.

INITIAL OPERATION

The Mission was ordered to enter Japan with the U.S. Marine Fifth Amphibious Corps, at SASEBO and to locate and maintain headquarters there. The pur-

pose was to associate the Mission with an area of Japan occupied by a naval unit in order that the Mission might obtain all logistic support from that organization; and to permit the Mission to furnish it intelligence services. After landing, the Mission established headquarters in buildings formerly used for workers' barracks in the SASEBO Naval Arsenal. Billeting and messing facilities for officers and men were also provided in these buildings.

While the Mission was enroute to Japan, dispatches were received from Commander Third Fleet requesting that a naval technical intelligence team be sent immediately to YOKOSUKA to exploit targets in that area. A representative of the Mission was flown from Saipan to TOKYO to consult with the Staff, Commander Third Fleet, and upon arrival of the unit in SASEBO, a team of approximately 25 officers and enlisted men left for YOKOSUKA. Shortly thereafter, a request was received from Commander Fifth Fleet (the Third Fleet having been relieved) requesting that a team enter KURE with the initial Army landing in that port. This team joined at Okinawa the convoy assembling for KURE and landed there on 7 October 1945.

Within a period of three weeks from the initial landing at SASEBO, technical intelligence teams stemming from the headquarters of the Mission at SASEBO had entered TOKYO, YOKOHAMA, YOKOSUKA, KURE, HIROSHIMA, OSAKA, NAGOYA, KYOTO, MAIZURU, MATSUYAMA, KOCHI, FUKUYAMA, OKAYAWA, NAGASAKI, KUMAMOTO, MOJI, SHIMONOSEKI, KOGOSHIMA and FUKUOKA, with or shortly after the initial landing of the Army or Marine units in these cities.

Within four weeks, technical intelligence teams were established in or within easy reach of all major industrial centers in the main Japanese Islands of KYUSHU, HONSHU, SHIKOKU and HOKKAIDO, and teams had entered China and Korea. The purpose was to fan out quickly available talent at headquarters so that qualified representatives of the Mission would be available in all parts of the Empire to evaluate targets, to interrogate Japanese naval and civilian personnel, and to report in summary form, the intelligence value of that area. A secondary purpose was to provide qualified Navy personnel in each area who could clear all naval equipment for demolition and who could when necessary instruct Army or Marine personnel in methods of demolition.

The magnitude of the task assigned to the Mission presented almost immediately two major difficulties. One was the increasing necessity for well-equipped and competent technicians to cover the vast field of Japanese naval developments. Qualified specialists and experts had already been requested from the Bureau of Ships, the Bureau of Ordnance, the Bureau of Yards and Docks and the Bureau of Medicine and Surgery. This problem was quickly solved by the immediate action of the bureaus concerned. The best officers and technicians in their respective fields were made available, and in not a few instances that personnel had a valuable knowledge of the Japanese and their language through having either been born in Japan or having lived there before the war.

The second, but none the less important difficulty confronting the Mission, was one of location. SASEBO, located on the island of KYUSHU, is in a provincial and agricultural area of Japan, as far removed from the scientific and technical centers in the vicinity of TOKYO as it is possible to be and yet remain on the main islands of the Empire. It was evident from the very beginning that this headquarters location would add to the complexities of obtaining information, make difficult the interrogation of Japanese scientists, engineers and naval officers, and would not permit adequate liaison with the Military Intelligence Section of the General Staff of the Supreme Commander for the Allied Powers. Every day the Mission attempted to operate with headquarters at SASEBO only served to prove the handicap which that location placed upon it. It was remote from all the industrial centers of Japan; communications were poor; and all intelligence units operating in the Empire, such as U.S. Strategic Bombing

Survey, the Compton-Moreland Scientific Survey, the Air Technical Intelligence Group, and the Military Intelligence Section of SCAP, had headquarters in TOKYO. The function of the Naval Technical Mission to Japan had to be correlated with the activities of these groups in order that all intelligence units could profit from the disclosures obtained by each.

The basic technical intelligence instruction from SCAP, dated 2 October 1945, directed that the Assistant Chief of Staff, G-2, coordinate and supervise the exploitation of intelligence targets in Japan and Korea. Location of headquarters in TOKYO thus became mandatory and immediate steps were taken to obtain permission to shift the headquarters of the Mission to this central location. Permission was finally granted just prior to 1 November 1945 to relocate the headquarters of the Mission in TOKYO.

At SASEBO on 29 October 1945 Commander Fifth Fleet placed USS BLACKFORD (APB-45) at the disposal of the Chief of the Mission and headquarters was moved aboard. Expeditious departure was effected and on 1 November, BLACKFORD arrived at the Shibaura Ferry Slip, Tokyo Bay.

HEADQUARTERS IN TOKYO

The relocation of the headquarters in TOKYO, besides permitting better and closer liaison with other intelligence units, improved immeasurably the effectiveness and efficiency of the Mission. Access to much intelligence information was now more readily available. Communications with investigators deployed throughout the Empire were facilitated, permitting better coordination of the activities of each team with the activities of headquarters. Billeting and messing facilities were greatly improved. At first the entire complement of officers and men was billeted aboard BLACKFORD, but increase of personnel required more facilities and an additional barracks ship, APL-46, was allocated by Commander Fifth Fleet. Subsequently, quarters were obtained for the Chief of the Mission in the Imperial Hotel in TOKYO, and for 40 senior officers in the Dai Iti Hotel, both hotels being Army billets.

All logistic support for the Mission, such as food and quarters for the overflow of officers and men billeted in TOKYO, Army winter uniforms for all personnel, and maintenance of automotive equipment were provided by the Army. The Mission could not have satisfactorily completed its work in Japan without this assistance.

The administrative offices of the Mission remained aboard BLACKFORD, but the office of the Chief of the Mission was established in the Meiji Building in the downtown section of TOKYO. The Technical Department, under whose cognizance came the responsibility for accomplishing the specific tasks of the Mission, was also established in the Meiji Building and space was allocated for conferences and interrogations. Thus the working unit was in close proximity to other intelligence units and liaison offices, an arrangement which provided a very satisfactory and efficient method of operation.

By 1 November 1945 the Mission had grown to approximately 295 officers, 125 enlisted men and 10 naval technicians. Among the officers was a delegation of approximately 23 British technical specialists and language officers, an able and experienced group which cooperated effectively on many difficult investigations. There was a constant turn-over in the personnel attached to the Mission due to the arrival of specialists and the detachment of officers

having completed their assignments.

ORGANIZATION WITHIN THE MISSION

Under the Chief, the Mission was divided into two departments, Executive and Technical. Under the Executive Officer were several assistants and section heads in charge of liaison service, administrative files, personnel, supply, transportation, communications, shipment of seized enemy material and documents, and language services. Under the officer-in-charge of the Technical Department, was an assistant officer-in-charge, and section heads in charge of the Ships, Electronics, Ordnance, Medical, Special, and Petroleum Sections, as well as the Atomic Bomb Medical Group. With necessary additions, the organization of the Technical Department closely followed that of the Foreign Department of the Office of Naval Intelligence, each having substantially the same cognizant sections.

In addition, there were two other activities in the Technical Department. One was the Progress and Reports Section which was charged with the responsibility of filing intelligence material, and with the receiving, editing, typing, and final printing of the technical reports of the Mission. This section also correlated the activities of each section to eliminate duplication and maintained progress data on the exploitation of each target so that the overall completion of the Mission's work could be predicted. It is interesting to note in passing that nearly all typists in this section, about 20 in all, were Japanese civilians. A considerable amount of drafting (some 3000 items were eventually drafted) was necessary in connection with preparation of reports, and this work was originally done largely by Japanese obtained from the Ship Construction Section of the Technical Department of the Japanese Navy Ministry.

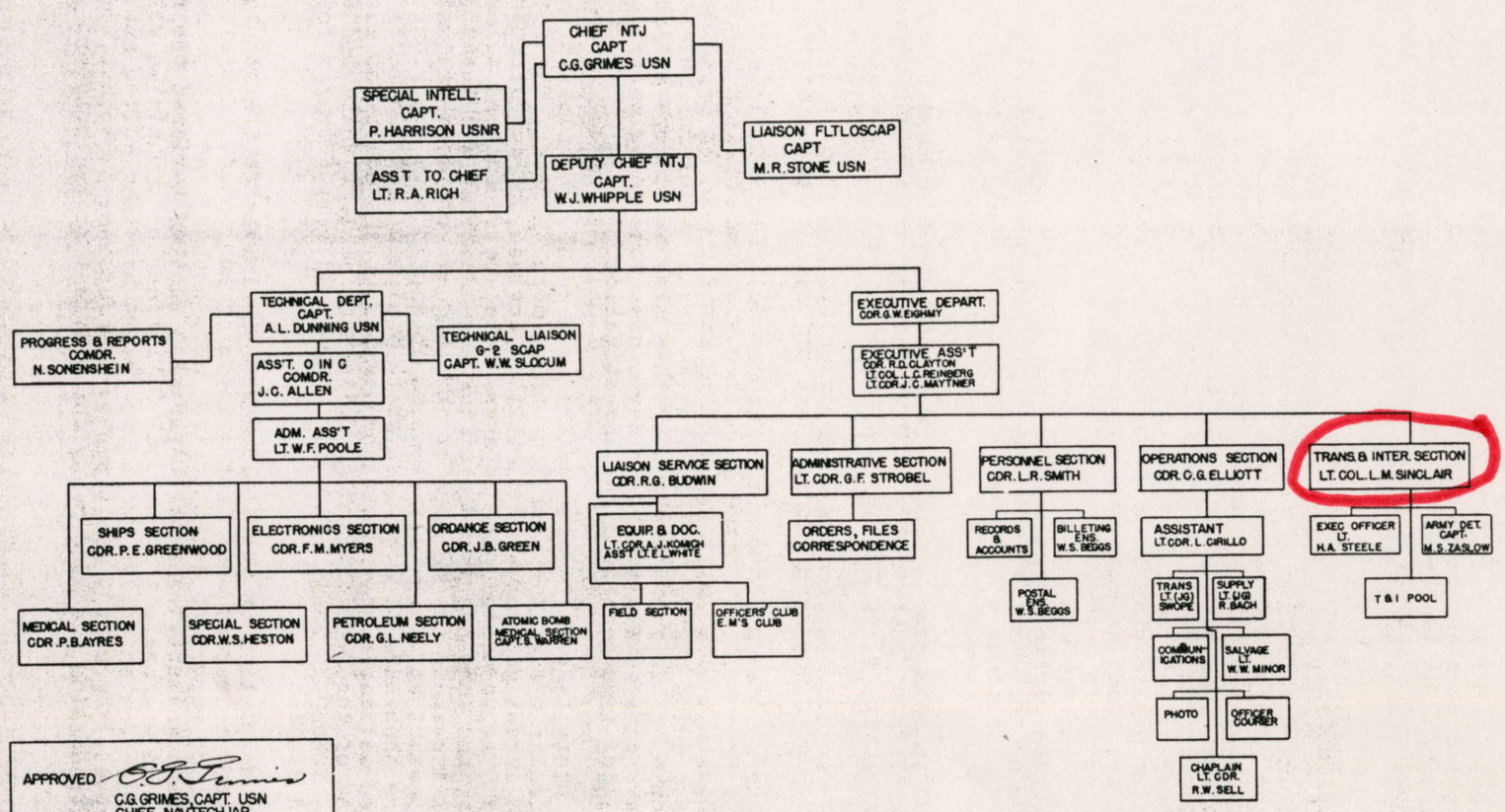
The other activity in the Technical Department was designated Technical Liaison, G-2, SCAP. Immediately on arrival of the Mission in TOKYO, an officer was detailed as NavTechJap Liaison Officer to Military Intelligence Section, G-2, SCAP. This officer attended all General Headquarters, SCAP policy-forming conferences and meetings which affected naval intelligence. He cleared all naval intelligence targets with and passed all intelligence material and information gathered by the Mission to the Military Intelligence Section, G-2. This close cooperation between the two organizations benefited both and resulted in a respect and admiration for the quality of work which both organizations were doing. It immeasurably improved the quality of the overall intelligence gathered in this area.

In addition to the Technical and Executive Departments, a separate Special Intelligence Group was maintained. This group was employed in the exploitation of such non-technical targets as were requested by higher authority, or as were left uncompleted on the departure from Japan of the U.S. Strategic Bombing Survey.

Figure 1 presents graphically the overall organization of the Mission.

On 1 November 1945, Commander Fifth Fleet ordered the Chief of the Mission to designate one officer for each Army, Corps and Division area in Japan, who, in addition to his duties with NavTechJap, would act as liaison officer from the Fifth Fleet to the Army unit. The estimated officer requirements for this liaison service was 25 senior officers. The Fifth Fleet Liaison Officers were

U. S. NAVAL TECHNICAL MISSION TO JAPAN
ORGANIZATION CHART



APPROVED C.G. Grimes
C.G. GRIMES, CAPT. USN
CHIEF, NAVTECHJAP

ENCLOSURE (A), continued

established to place a qualified naval officer with each Army unit who could initiate action to clear naval problems arising in the Army unit and who could make recommendations to the Army, when requested, on methods of demolition of Japanese Navy equipment. Figure 2 shows the organization of the Liaison Service.

METHOD OF APPROACH

The primary objective of the Mission was to find, investigate, examine, evaluate and report on Japanese naval equipment, documents and methods. Before the cessation of hostilities, the Office of Naval Intelligence was ready with a complete list and description of information desired by the several Bureaus of the Navy Department and the specific targets to be investigated. As early as 15 September 1945, copies of "Intelligence Targets Japan" (DNI) of 4 September 1945, a publication prepared by Chief of Naval Operations, were received by NavTechJap. That advance planning crystallizedthe objectives of the Mission and permitted it to move at once into the field with specific purposes. Copies of "Intelligence Targets Japan" were issued to all officers concerned. The book itself was divided into several sections, each having the same general designation as the name of sections comprising the Technical Department of the Mission. The sections of the book were in turn broken down with a description of each specific target designated by number. A target is usually understood to mean a definite object in a specific place, but a slightly broader definition was applied in this case. A target was understood to mean a technical "subject" regardless of where activities pertaining to it might be located within the Empire. Every piece of equipment of the same type obviously would not be investigated, but the original type and all subsequent modifications were covered. This method resulted in a comprehensive report on the development and use of the entire subject, and not just one unit or phase of the subject.

Another helpful guide was the "Report on Scientific Intelligence Survey in Japan, 1 November 1945" (the so-called "Compton-Moreland Report") summarizing the findings of a small group of scientists who, in September and October 1945, made a quick survey of the Japanese organization for scientific research and development. In fact, members of that mission, before publication of their report, gave advance suggestion to NavTechJap concerning certain fields or devices meriting immediate detailed investigation.

With "Intelligence Targets Japan" as a guide, technicians and specialists in a particular field were assigned one or more targets. The activities of the individual investigations were closely supervised and coordinated by the section heads. As requested, key Japanese naval personnel and scientists were produced by the Japanese Liaison Office for interview and interrogation. In nearly all instances one or more of the language officers assigned to NavTechJap were present at these interviews to interpret both questions and answers. Visits were then made to locations where equipment and documents could be found. When deemed advisable, documents and samples of the equipment were seized and sent to one of the four NavTechJap collection centers which had been established at SASEBO, YOKOSUKA, KURE, and KOBE, where they were prepared for shipment to the United States.

After completion of the field work, the investigators returned to TOKYO where a complete report was first written in long hand. A staff of editors processed each report to determine its completeness and acceptability. The head of the cognizant Technical Department section reviewed the report for technical and engineering accuracy. No officer or technician was permitted to return to the United States until his report had been edited and accepted. Once accepted, the report was typed by the Japanese personnel, in the Progress and Reports Section and made ready for shipment to the printer.

In many instances it was necessary to do more than simply investigate the material on hand. For example, a new model, 20-cylinder diesel engine was about fifty percent completed when Japan surrendered and all construction and development of war material stopped. The engine showed promising possibilities. The originating Japanese engineers and scientists were located and brought back to complete its construction at the expense of the Japanese government. Upon completion tests were run to determine its performance.

The search for data and equipment on Japanese petroleum research seemed hopeless, until the remains of a laboratory were discovered at OFUNA. Most of the documents, data, etc., were said to have been destroyed, but enough remained to indicate that a sizeable establishment was once in operation there. Again the Japanese engineers, draftsman, scientists and research men formerly employed in the laboratory were assembled to duplicate plans, drawings and experimental data which had been developed. Strangely enough, the Japanese scientists took considerable pride in accomplishing this work to demonstrate the extent of their advancement. The net result was a complete disclosure of Japan's petroleum research.

FINAL STAGE OF THE MISSION

By early February 1946 reports in rough form were being submitted in volume. The means for completing and printing reports were not available in Japan, and CinCPac made available the facilities of the Joint Intelligence Center, Pacific Ocean Area, to the Mission for that purpose. JICPOA was well-established in Pearl Harbor in a separate building with trained personnel and modern equipment for typing, drafting, laying-out, and printing reports. The Progress and Reports Section was, therefore, moved by plane to Pearl Harbor on 22 February 1946. Upon completion of technical investigations several weeks later, all activity of the Mission in Japan was terminated and, on 11 March 1946, the remaining personnel left the Empire and established headquarters in the JICPOA Building in Pearl Harbor. This arrangement permitted close cooperation, eliminated delays, and provided the highest possible security.

Editorial work was highly important. Since there were to be nearly two hundred separate reports, uniformity in arrangement was desirable. No effort was made to standardize the author's style, though clarity of expression, accuracy of statements and figures and adequate cross-referencing were necessary if the reports were to be of value. A proper segregation of descriptive matter and tabular statistics was sought, and much material placed at the end of the reports as appendices or enclosures to avoid cluttering up the text. A summary was provided at the beginning of each report to give a quick picture to the reader not interested in detailed descriptions and figures. References were given to other NavTechJap reports on similar or related subjects or to those prepared by other activities such as USSBS, ATIG, and TLID.

NavTechJap and JICPOA worked so closely on the production of reports that the problems of one were the direct concern of the other. Difficulty in obtaining an adequate number of typists was matched by the need of capable layout personnel, and the demand for draftsmen was perhaps the hardest of all to solve. About 1 May, for instance, when all possible sail was being crowded to complete the project, NavTechJap had 10 draftsmen on this work, JICPOA furnished 5, Naval Shipyard, Pearl Harbor supplied 25, the 30th Engineer Topographical Battalion at Schofield 6, Naval Shipyard, Mare Island 35, and Naval Shipyard, San Francisco, 15.

All naval activities had common problems resulting from the loss of high-point, trained personnel and the demobilization of the Naval Reserve. But the work of the draftsman, photographer, printer, required highly specialized skill which made replacement by inexperienced personnel (even when available), a

very slow procedure. Consequently the small group of qualified personnel worked under extreme and unceasing pressure. Especial commendation is due JICPOA whose resourcefulness, untiring effort, and admirable "know-how" contributed so much to the success of the concluding phase of this Mission.

OBSERVATION AND COMMENT

It is for others to evaluate the results of the many investigations undertaken by NavTechJap. Some targets were of interest because of new, unique, or superior design by the Japanese. Other targets produced seemingly negative results which nevertheless have positive value from knowing that another nation has verified our research and conclusions, or has tried methods new to us yet which failed of accomplishment.

NavTechJap investigators, unarmed and often alone, visited scores of places in Japan, both urban and rural, and never once were molested or threatened. Usually the American was ignored, little curiosity being displayed by Japanese adults. When they were asked for information, friendliness and willing cooperation were the general rule.

Of considerable interest was the observation that the Japanese Army and Navy both deliberately spurned the scientist, whose knowledge, laboratories and research equipment might have contributed so much toward a more successful prosecution of the war by the Japanese. The scientist recognized this and felt deeply injured over the lack of confidence in his ability and his loyalty. Little organized research was carried on during the war. A corollary to this, is the fact that by such policy Japan failed, in general, to realize those tremendous and permanent scientific advances that the modern nation gains from huge wartime expenditures for research.

The common concept that the Japanese lack originality and are merely an imitative people is in need of qualification. They entered the fields of science and mechanical industry only a comparatively few years ago. The sensible thing was to engage in wholesale copying until they caught up with other countries. Had they proceeded independently in scientific research and discovery, they would always have been fifty years behind. The Japanese may be especially adept at copying but evidence of their originality and ingenuity is not lacking.

The Japanese received very little effective help from the Germans or the Italians. It is true that the Japanese I-400 type submarines were equipped with Schnorkel, but it is understood the Japanese saw a German submarine in Hong Kong and copied the Schnorkel features. A Japanese submarine crew was sent to Germany for training, but all hands were lost on the trip back. Some assistance was received from Germany pertaining to electronics, but Japan was still well behind us in the design of this equipment. Such information as the Japanese obtained was largely of a general rather than specific nature. The single important exception seems to have been the assistance given by Germany in the sonar field. Some of the Japanese equipment was almost an exact copy of captured British equipment.

At the time of the Pearl Harbor attack, Japan had a strong and well equipped navy, with ships that were of good design and rugged construction. Three of them, the battleships YAMATO and MUSASHI, and the aircraft carrier SHINANO, were the largest, and in many respects, the most powerful warships in the world. YAMATO and MUSASHI had standard displacement of 63,000 tons each (when fully loaded, 73,000 tons) and a speed of 28 knots. Their main battery, consisting of nine 46cm. (18.1-inch) guns had a maximum range of 45,000 yards. This is noteworthy in itself, since they were the largest naval guns in the world.

To match this, the largest United States battleship was the WEST VIRGINIA

of 32,400 tons standard displacement, 21 knots speed, and main battery of eight 16-inch guns.

During the latter part of the war, surface ship production was largely abandoned by the Japanese in favor of submarine production, and during 1944 they brought out the I-400 class, three huge submarines whose primary mission undoubtedly was bombing the Panama Canal and cities of the United States. They had a displacement of 5,550 tons each, a length of 400 feet, a maximum speed of 19.7 knots surfaced and 7 submerged, and cruising range of 34,000 miles at 16 knots. Eight torpedo tubes and one 5.5-inch deck gun comprised the armament. In addition, in a hangar tube (11.6 ft. diameter) on main deck, each submarine carried three bombing planes, each weighing about four tons, capable of 290 knots speed, and carrying a bomb of 0.8 tons or one 18-inch airplane torpedo.

By comparison, our largest submarine was NAUTILUS, with a displacement of 2730 tons, a length of 371 feet, a speed of 17 knots surfaced and 8.5 submerged and a cruising range of 15,000 miles. The armament consisted of eight tubes for 21-inch torpedoes and two 5-inch guns which were later replaced by 3-inch.

The Japanese developed very successfully torpedoes of three different types, using pure oxygen, air, and electricity for propulsion. There was nothing unusual about the 18-inch, air-driven torpedo, but the 21-inch electric type, with a range of 7500 yards at 30 knots, was an effective weapon because it left no wake, was easy to manufacture and hence used extensively.

In time of war persons of every nationality show unlimited courage and self-sacrifice, but never before was the willingness of the individual soldier to destroy himself so incorporated into the wartime policy of a nation. When Japan was forced to change from offensive to defensive warfare, she realized it would cost the lives of many brave men, but coolly and efficiently she devised plans and equipment which would take numerous enemy lives in exchange for each native son.

The best known of these implements of self-destruction was the Kamikaze plane, which was considered not so much a projectile carrier as the projectile itself, with a human being as part of its steering and control mechanism. The men who volunteered for this one-way ride were a select group of Japan's best pilots, and there were always more volunteers than planes.

The Baka Bomb and its human control was a variation of the same idea of death in and from the air.

On the surface of the water, it took the form of Shinyo, a small special attack boat which utilized the explosive charge in its bow by ramming the side of the intended victim. These motor boats were collected in special attack basins along the coast or carried on mother ships. Such suicide craft were manned by middle school boys of 15 and 16 years of age. It is reported that a supply of volunteer pilots was obtained because of special privileges, early responsibility, fast promotion, and the promise of a posthumous monetary award to the volunteer's parents.

Underwater opportunities for destruction stimulated the Japanese imagination. The Kaiten ("Great Undertaking") was a one-man submarine which was substantially an altered torpedo having human control and additional fuel capacity inserted between the torpedo warhead and the torpedo engine. Six Kaiten were carried on the decks of I-type submarines and connected by tubes through which the pilot could enter the torpedo and start on his journey without the submarine having to surface. These midget or suicide subs were manned by young volunteers of 18 to 20 years, attracted by much the same inducements offered the Shinyo pilots. The Japanese claimed great success in the encounters be-

tween Kaiten and enemy shipping.

The Japanese had amphibious tanks 35 feet long, that rode "piggy back" on submarines. In preparation for an attack, the submarine would surface, and, after the tank had drained, it would be boarded by a crew of one officer and six men and a landing party of 35 men. The tank would then be driven off the sub, or the later would submerge, leaving the water-borne tank ready to proceed under her own power. When the Nipponese strategy turned defensive in 1944, these sea-going tanks were modified to include torpedo cradles. Upon reaching an objective, both torpedoes would be released at short range. No attempt to return ashore for re-loading would have been made, as the expendible tank would have simply been scuttled on the spot, and the brave but hapless crew would join their honorable ancestors. (These mechanical oddities were never known to have been used operationally although about 100 were built.)

Still another, though less well-known suicide group, was the Fukuru, or "Crouching Dragons". Had the war reached the stage of repelling an amphibious landing on the shores of HONSHU, the Fukuru were prepared and equipped to walk underwater and ram an explosive bomb against the hull of an enemy landing craft. These "underwater kamikazes" wore diving suits equipped with two oxygen tanks, submarine-type air cleaning devices, and tubes for liquid food, and could operate effectively in water 50 feet deep, walk underwater more than a mile an hour, and stay underwater for ten hours. At the war's end, 4,000 Fukurus were at the YOKOSUKA Naval Base, of whom 1200 were fully trained.

Loss of much of her shipping capacity and the resulting fuel and food shortage caused Japan to give consideration to suggestions by her oceanographers that ocean currents be utlized for transportation of necessities. Since 90% of the drift bottles set adrift in the Japanese Sea off the east coast of Korea reached the northern part of HONSHU it seemed feasible to use the Kuroshio (Japan Current) for the transportation of soya beans from Manchuria and other goods from Formosa, Nansei Shoto, etc., to Japan proper. A small wooden ship of 200 tons was successfully floated from FUSAN to HONSHU. Then plans were made for floating metal drums which would drift below the surface but some in every lot would be equipped with radios, and at intervals would rise and be contacted by land stations in order that their movements could be traced. Loss of the Philippines meantime, prevented carrying out the plan.

Japan was far behind us in the field of electronics, but her experiments with a "Death Ray" may nave the unique outcome of saving countless lives threatened by tuberculosis. These experiments showed a pronounced effect on the lungs of the animals tested, and further research was contemplated toward a possible cure for tuberculosis. It was noticed that higher frequencies affected the brain. The investigators realized that heat was an evident factor but were sure that frequency was important also. The frequency characteristic could be associated with the resonance dimensions of the head and body respectively. It is quite possible that Japanese or American investigators may develop treatment for tuberculosis and for certain brain disorder that will have great therapeutic value. A mass chest X-ray program for the diagnosis of tuberculosis was interruped by the war, but Japan was using an "immunization" technique that should be further investigated.

The Japanese medical officers observed that most cases of night-blindness occured with pilots having liver trouble and whose secretion of the bile was not normal. Acting on this hint, they developed a preparation named "Migozai" whose ingredients stimulate the secretion of the bile and the absorption of Vitamin A, so necessary for the retina of the eye The vision of the dark - adapted eye when taking this preparation improved from 1½ to 2 times. This means, looking at the same object, the eye can see it from twice the distance.

More notable, and certainly more far reaching, is the discovery of two drugs by Japanese who were searching for some therapeutic agent resembling

cnolrophyll, with its power of converting sunlight into energy. These were derived from neocyaine and named Koha and Shiko (meaning Rainbow Wave and Violet Light). The drugs improve general body resistance and stimulate regeneration of tissue. The Japanese have demonstrated remarkable results when used in leprosy cases. Burns and frostbite responded with gratifying acceleration, while benzine burns and boiling water burns especially, showed quick improvement.

Of considerable interest is an unusual type of hangar constfuction that the Japanese had developed. It was called the "Diamond Truss", from the diamond-shaped pattern formed by the intersecting arches. It is in reality a hangar made of a series of intersecting skew arches. In this novel design, the skewed arches form the longitudinal bracing of the structure in addition to taking the regular loading. The design resulted in a tremendous saving of steel. At first glance it would appear that the cost of fabrication of such an unorthodox structure,would be prohibitive, but actually, no bent plates or structural shapes were necessary and standardization on the sizes of hangars kept the steel detailing to a minimum. The entire structural frame is made up of plates and angles. To avoid complicated framing at the intersections of the arches, the top and bottom chords of the arches were cut and framed into gusset plates. This type of construction might well receive consideration by our architects and builders for any structure where large roofing areas are involved, such as hangars, garages, factory and mill buildings, armories, and gymnasia.

Petroleum was the " Achilles Heel" in the Japanese armor, and her lack of this precious fuel was the fundamental cause of her downfall. When the Japanese super-battleship YAMATO made her suicidal sortie southwest of KYUSHU in the waning months of the war, she was powered by edible refined soya bean oil. U.S. Navy planes sank the soy bean-burning warship on 7 April 1945 when she was intercepted enroute to attack American shipping at Okinawa.

Lack of oil resources kept scores of Nipponese ships lying immobile in KURE and other ports and many of her battleships and cruisers were sitting-duck targets, easily sunk by bombs and torpedoes dropped by our airmen.

Japan's efforts to find substitute fuels were frantic (and to a limited extent effective), but entirely inadequate. Until the beginning of the war, the Japanese Navy's chief source of diesel and bunker fuel was imports from California. This stockpile was exhausted in 1942 and cracked residues from Sumatra and Borneo crudes were than utilized as bunker fuels. In 1944, due to Japanese tanker losses to U.S. submarines, research and practical testing were undertaken on both diesel and boiler fuels to develop substitutes. By the spring of 1945 aircraft carriers were utilized as tankers to bring motor gasoline from Singapore to be used as charging stock in the manufacture of even more desperately needed aviation fuel.

Satisfactory diesel fuels were produced from coconut oil, hydro cracked; pressed copra oil; esterfied copra oil; and soya bean oil. Pine root oil was used too, but had a tendency to leave gummy deposits in the engine. A determined effort was made to develop an industry for converting coal into oil, but the results were comparatively insignificant. As a matter of fact, the outputs of oil from shale at FUSHAN, until 1944, exceeded the combined output from all coal conversion processes.

During the last year of the war the Japanese had considerable success with a program for producing alcohol and using alcoholic aviation fuels. For instance, they were able to produce one pound of ethyl alcohol from the fermentation of eleven pounds of sweet potatoes. This in turn necessitated vital decisions about which varieties of potatoes were best for food and which best for fuel,

and how the two should be apportioned to keep the nation alive to fight.

By the spring of 1944, the supply of cane sugar and molasses from Formosa, Java, and the Philippines was decreasing and more emphasis was placed on Manchurian grain as a raw material source of ethyl alcohol. Finally, butanol plants were converted to the production of ethyl alcohol. Thus the Japanese were converting rubber into gasoline for war purposes while in America gasoline was being converted into rubber, with the same end in view.

STATISTICS, MEASURE OF ACCOMPLISHMENT

The duration of the Mission was from 1 September 1945 to 1 November 1946.

During the existence of the Mission, 350 officers and 260 enlisted men (Army, Navy and Marines), 29 British officers and men, and 16 naval technicians, (a total of 655) reported for duty. Attached is a list of all personnel with their last known adresses.

A total of 185 separate reports comprising approximately 10,000 printed pages, were prepared and 500 copies of each were printed.

Approximately 3500 documents were seized and shipped to the Washington Document Center and the technical bureaus of the Navy Department.

Approximately 15,000 pieces of equipment were seized and shipped to the United States for laboratory investigation. The largest items were two 18.1-inch guns shipped from KURE, each 75 feet long and weighing 180 tons.

Pictures of the principal personalities associated with the Mission, and of the offices and quarters maintained follow.

ENCLOSURE (A), continued

U. S. NAVAL TECHNICAL MISSION TO JAPAN
ROSTER OF ARMY PERSONNEL

(Officers)

Name	Rank	Serial No.	Service	Address
BALDRIDGE, R. C.	1st.Lt.	0516511	AUS	1112 W. 8th. St. Topeka, Kansas
BENNETT, A.	Capt.	022731	AUS	The Old Point Nat'l Bank, Phoebus, Ga.
BRUNER, G. W.	Major	0503399	AUS	205 Hendron St. Walsenberg, Colo.
DIETTERLE, S. L.	1st.Lt.	01114454	AUS	53 Menlo Pl. Berkley, Calif.
DIXON, S. B.	1st.Lt.	0520519	AUS	610 E. 9th St. Houston (7), Texas
DONALDSON, G. P.	Capt.	0461016	AUS	Abraham Baldwin College, Tifton, Ga.
GIGLIO, C.	2nd Lt.	0876515	AUS	1218 Leland Ave. Bronx (60), N. Y.
HALL, M. A.	Major	0370491	AUS	Ridgewood Rd. Jasper, Alabama
HORN, M. R.	1st.Lt.	0545302	AUS	Bertha, Minnesota
JORGENSEN, W.	Major	0308731	AUS	Hollywood Farm, Woodville, Wash.
KAPLAN, D. S.	1st.Lt.	0545440	AUS	Army Detachment, CincPoa HQ, FPO, S. F., Calif.
LAMB, F. W.	Capt.	0384602	AUS	Army Staff, CincPoa, FPO, S. F., Calif.
PARKER, R. R.	1st.Lt.	0532676	AUS	2213 Los Angeles Ave. Pittsburg (16), Pa.
PERKINS, L. C.	Capt.	0509114	AUS	623 Perkins Ave. Colfax, Wash.
SINCLAIR, L. M.	Lt.Col.	0334699	AUS	3720 Ivy St. DelPaso Hgts. Sacramento, Calif.
SNEIDER, R. L.	1st.Lt.	0558646	AUS	AAF Annex #2 Gravelly Pt. Wash. D. C.
TOLBERT, S. H.	Major	0570546	AUS	801 W 18th St. Vancouver, Wash.
VATCHER, W. H.	1st.Lt.	0558478	AUS	912 Beverly Dr. San Gabriel, Calif.
WEBSTER, A. G.	1st.Lt.	0558476	AUS	505 Pendleton St. Waycross, Ga.
YUDKOFF, A. S.	1st.Lt.	0558498	AUS	2501 Davidson Ave. New York 63,N.Y.
ZASLOW, M. S.	1st.Lt.	0545869	AUS	Army Detachment CincPoa HQ, FPO, S. F., Calif.

(Enlisted)

Name	Rank/Rate	Serial No.	Service	Address
AOYAMA, T.	T/3	30106403	AUS	1627-D Nuuanu Ave. Honolulu, T. H.
CAIN, E. L.	Cpl.	37401540	AUS	359 Whittier St. St. Louis, Mo.
CUELLAR, C.	T/4	39700018	AUS	2817 Macon St. Los Angeles 41, Calif.

(Enlisted)

Name	Rank/Rate	Serial No.	Service	Address
DANIELSON, D. D.	T/5	36950683	AUS	910 E. 62nd St. Chicago 37, Ill.
FILMER, S. H.	T/4	12144829	AUS	5 Grove St. Port Chester, N. Y.
FURUIYE, N.	T/Sgt	38083529	AUS	Rt. 1 Box 63 Lafayette, Colorado
HARADA, J. L.	T/3	39017459	AUS	1633 Nuuanu St. Honolulu, Hawaii
HEIDORN, L.	T/5	3665872	AUS	Winslow, Indiana
HIRANO, F. M.	T/3	39166325	AUS	2106 3rd. Ave. Minniapolis, Minn. deceased
HENDON, T. S.	M/Sgt	14001684	AUS	410 W. 2nd St. Leland, Miss.
INAGAKI, G. J.	T/3	37566034	AUS	674 Wall St. Salt Lake City, Utah
ISOKANE, S.	T/3	30106672	AUS	2528 Stream Dr. Honolulu (3), T.H.
JENKINS, J. H.	T/4	13106315	AUS	413 Butternut St. N. W. Wash., D.C.
KUWAHARA, B. A.	T/3	30106642	AUS	P.O. Box 859 Honolulu(8), Hawaii
KAWAMOTO, E. T.	T/Sgt	30105395	AUS	1014 Long Lane Honolulu, Hawaii
KAWAMOTO, G.	T/3	30100326	AUS	P.O. Box 3 Volcano House Hawaii Nat. Pk., T. H.
KAWASAKI, T.	T/4	30106725	AUS	P.O. Box 370 Waipahu, Oahu, T. H.
KONOKOWSKI, D. P.	T/3	16168870	AUS	824 N. Ashland Ave. Chicago, Ill.
KOYANAGI, T.	T/3	30106676	AUS	Box G. Papaikou, Hawaii, T. H.
KRUEGER, H. J.	T/5	32721078	AUS	651 East 236th St. New York(66), N. Y.
KUBOTA, H.	T/3	30103678	AUS	130 A Bates St. Honolulu, T. H.
KUGA, F. T.	T/3	30101996	AUS	c/o Waialai Ser. Sta. Honolulu, (55), T. H.
LEONARD, R. C.	T/5	19144287	AUS	Army Detachment, CincPoa, Navy 128, FPO, S. F., Calif.
LINDSAY, W. C.	T/4	39209152	AUS	3725 NE. 37th Ave. Portland, Ore.
MAKINO, W. Y.	T/3	39019037	AUS	419 Sunset Blvd. Los Angeles, Calif.
MATSUI, J.	T/3	30106512	AUS	Waikapu, Maui, T. H.
MIYAGI, T. T.	T/4	39021104	AUS	558-B S. Hotel St. Honolulu, T. H.
MIYATA, R. M.	T/3	39168691	AUS	2030 Clarkson, St. Denver(5), Colo.
NAGATA, S.	T/4	30105431	AUS	1109 Pinkham St. Honolulu T. H.
NAGATA, N.	T/4	30106576	AUS	1423 16th Ave. Kaimuki, Hon. T. H.
NAKADA, K. Y.	T/3	30106599	AUS	Adjutant General, Washington, D.C.
NATHAN, L. H.	T/5	31354340	AUS	121 Park Dr. Boston (15), Mass.
OKA, C. D.	T/Sgt	39089420	AUS	3432 Quivas St. Denver (11), Colo.
OKADA, H. H.	T/4	30105329	AUS	938A N. Vineyard St. Hon., T. H.
OLIVER, J. A.	T/4	39530988	AUS	905 16th Ave. Longview, Wash.
ORLANS, C. A.	T/4	15307345	AUS	891 Wash. Ave. Brooklyn(25), N.Y.
OTA, K.	T/4	39002339	AUS	Adjutant General, Washington, D.C.
OTANI, J. S.	T/4	39089688	AUS	610 "N" St. Sacramento, Calif.
PLUMMER, J. F.	T/5	30334308	AUS	469 Hill St. Waterbury, Conn.
SACK, E. H.	T/5	32633564	AUS	Curling, New Foundland
SAITO, J. H.	T/3	30106518	AUS	2280-A Date St. Honolulu, T. H.
SCHLATTER, C. R.	T/5	16073640	AUS	Army Detachment, CincPoa Navy 128, FPO, S. F., Calif

ENCLOSURE (A), continued

(Enlisted)

Name	Rank/Rate	Serial No.	Service	Address
SHIGETA, Y. J.	T/3	30106521	AUS	3734 Harding Ave. Honolulu, T.H.
SHIMAMOTO, T.	T/3	30107346	AUS	Adjutant General, Washington, D.C.
SKURNICK, J.	T/5	32815455	AUS	143 Morton Pl. Bronx (53), N.Y.C.
SPOOR, J. A.	T/Sgt	16087103	AUS	Army Detachment HQ, CincPoa Navy 128 FPO, S. F., Calif.
SWEENEY, W. C.	T/5	11057400	AUS	47 Smith St. Fitchburg, Mass.
TAMASHIRO, J. S.	T/3	30103636	AUS	P.O. Box 89, Waimea, Kauai, Hawaii
TERAO, N.	T/4	30106522	AUS	Box 185 Puunene, Maui, Hawaii
TORAKAWA, T.	T/4	39681266	AUS	P.O. Box 662 Bountiful, Utah
TSUTSUI, K.	T/4	30102926	AUS	Adjutant General, Washington, D.C.
TURNBEAU, C. C.	T/sgt	38447039	AUS	4248 Pleasant St. St. Louis, Mo.
WINSTEN, H. H.	T/5	31245917	AUS	75 Central Ave. Pawtucket, R. I.
YAGI, K.	T/3	39007295	AUS	413-15 Beason Bldg., Salt Lake City, Utah
YAMAGATA, M.	T/4	30106160	AUS	P.O.Box 691, Wailuku, Maui
YAMAMOTO, B. L.	T/3	30101854	AUS	P.O.Box 185, Pearl City, Oahu, T.H.
YAMAMOTO, S. Y.	T/4	30104662	AUS	P.O.Box 58, 920 Cedar St. Holoa, Kauai, T. H.
YAMASHITA, T.	T/5	30101449	AUS	58 Cabrinaha L. Kilauea Ave. Hilo, Hawaii
YOKOYAMA, H. N.	T/3	30106582	AUS	1154A Kokohead Ave, Honolulu (26), T. H.