

COORDINATION OF PROCUREMENT BY THE ARMY AND NAVY,
20 May 1946.

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CAPTAIN HENNING:

In viewing the background of Admiral Charlton, I could not help but be impressed regarding the work and varied career that characterized the making of a flag officer in the American Navy.

Admiral Charlton graduated with distinction in 1908 from the Naval Academy, sixth in a class of 200. His first service afloat was in the old Pennsylvania. After he was detached from the Pennsylvania, in 1911, he served as the Engineer Officer of the Nashville, which operated in the West Indies and Gulf of Mexico.

From September 1915 until June 1915 he was undergoing postgraduate instruction in mechanical engineering in the Postgraduate School at Annapolis. He then went to Columbia University where he received his degree of Master of Science.

Admiral Charlton served in the Navy Yard, Boston, from November 1917 until May 1918, when he reported to the Bureau of Steam Engineering in the Navy Department.

He was senior Engineer Officer on the Tennessee from November 1920 to September 1922. Then he went back to the Bureau of Steam Engineering for four years. Following that he was a member of the U. S. Naval Mission to Brazil. When he returned to the United States he again served a tour in the Bureau of Steam Engineering. He then became aide and Engineer Officer on the staff of the Commander, Battleships, Battle Force of the U. S. Fleet.

His next duty was as Inspector of Naval Material and Naval Inspector of Machinery in the General Electric Company at Schenectady. Following that he went to Cavite as an Engineering Officer.

In March 1935 he was transferred to duty as Fleet maintenance officer on the Staff of the Commander in Chief, Asiatic Fleet, serving under Admirals Upham, Yarnell and Murfin.

The Admiral's next duty was as Engineering Officer in the Norfolk Navy Yard. In 1940 he was assigned duty as manager of the Puget Sound Navy Yard. Then he went to Chicago as Inspector of Naval Material. Following that he reported to the Army and Navy Munitions Board as the Navy head of the Executive Committee. He later became head of the Production Branch of the Office of Procurement and Material, Office of the Under Secretary of the Navy.

This reviews the main points in the career of Admiral Charlton. His background certainly indicates it is a particularly rich one. He is well qualified, as much as others of whom you can think, for the talk

on joint procurement which he is going to give us here this morning. It is a particularly interesting time in that Admiral Charlton expects to retire within a few days and what he says no doubt will sum up his rich and varied career.

Admiral Charlton.

ADMIRAL CHARLTON:

Captain Henning, distinguished guests and fellow officers:

When General Armstrong asked me to talk to you today on the somewhat overpowering subject of "a review of the coordination by the War and Navy Departments of those functions involved in production control including determination of requirements for components and materials, allocation of facilities, manpower controls, scheduling production, inspection, packing, packaging and conservation," I wished that I had the laconic gift of the late Calvin Coolidge. You may recall the story of his being asked upon his return from church what the subject had been. "Sin," he replied. "What did the preacher say about it?" the questioner continued. "He is against it," said Mr. Coolidge.

It would be as pleasant for you as for me if I could deal with the matter of "coordination," by saying "I am for it," but I am afraid it cannot be disposed of as easily as sin.

Any discussion of the coordination finally achieved by the War and Navy Departments in obtaining the tremendous amounts of materials and components procured for the war effort must have as its basis the Army and Navy Munitions Board. The work of this board, assisted in no small measure by the Army Industrial College, was the foundation on which the War Production Board and many other war agencies were erected.

The Army and Navy Munitions Board was formed in 1922, consisting of the Assistant Secretary of War and the Assistant Secretary of the Navy. Due to various difficulties in determining an assumed war plan, the Army and Navy Munitions Board did little until 1931 when a reorganization was effected.

Plans for industrial mobilization were prepared, the first one being approved in 1933 and the last in 1939. The plan set out in great detail the organization of a War Resources Administration, to be manned by civilians assisted by the Military. A War Resources Board was appointed in 1939 by the Army and Navy with the approval of the President to review the Industrial Mobilization Plan and submit any recommendations considered necessary. This board was appointed in August 1939, before Hitler had invaded Poland and before the limited emergency of September 1939 was announced by the President.

The outcry against the War Resources Board apparently was enough to warrant the President stating in September 1939 that it would soon be disbanded--its work having been completed. This board was officially discharged in November 1939 without any action having been taken on its report, and apparently none ever was.

The Army and Navy Munitions Board had, of course, recommended the setting up of the War Resources Board because of its conviction that we would ultimately be involved in the war and because of its hope that the board would be established as a nucleus of the War Resources Administration.

Unfortunately, the timing of the proposal was premature as the use of the word "war," so far as it applied to entry of the United States, was anathema at that time. Presumably the limited emergency proclaimed in 1939 did not establish adequate authority to set up an emergency agency with board powers, and if an attempt had been made then the outcry would have been heard to high Heaven. The country just was not ready for it. It is interesting to note, however, that, a little over two years later, after the improvisation and confusion which perhaps could not be avoided while the country was being conditioned for active participation in the war, the governmental machinery developed for supervising the Nation's war economy closely resembled that proposed in the ANMB's 1939 Industrial Mobilization Plan.

The Army and Navy Munitions Board continued its studies of the allocations of industrial plants, and the War and Navy Departments placed educational orders within the funds they were allotted. There was not too much difficulty encountered by the Services in obtaining the material they sought to purchase at that time as the total appropriations to the Army and Navy for the fiscal year 1940 were less than two billion dollars.

One thing the Army and Navy Munitions Board did in 1939 was to start administering the strategic materials which were set up by the Strategic Materials Act (Public 117). That Act authorized the appropriation of 100 million dollars in the fiscal years 1939 to 1943 and actually appropriated 70 million. The Army and Navy Munitions Board had control of this money and spent 55 million dollars for strategic and critical materials.

By May of 1940, however, after the fall of France, the demands upon our economy not only for our own defense needs, but for England and France, were such that supervision of industrial mobilization was indicated. The Council of National Defense was called to life under the Act of 1916 and on 29 May 1940 the Council established an Advisory Commission. The weakness of this organization had been clearly demonstrated in 1916, but it was again used as the point of departure in developing governmental organization to mobilize industry. Probably its use at the time was based on the fact that it was the only machinery available based on statutory authority. However, neither the Council nor its Advisory Commission had any real authority, its sole function being advisory to the President.

Under the established procedure the Advisory Committee made studies and advised the Council, which in turn made recommendations to the President. There was no delegation of presidential authority at any point in the line. The principal advantage of its revival at that time

was that it focused attention of the public on the emergency, although the possibility of war was still not even thought of by the country. With 1940 a presidential election year, the regimentation entailed in government control over our whole economy could not even be contemplated by the Administration.

Just after the Council of National Defense was revived however, the ANMB went ahead with the formulation of a Priorities Directive (issued in August 1940) which assigned preference ratings to Army and Navy contracts. Manufacturers, for the most part, accepted these preference ratings on a voluntary basis for a certain length of time.

At this stage of the defense program (August 1940) the Advisory Commission to the Council of National Defense had no priorities organization or power, although all previous planning had provided that such a priorities system would be administered by a civilian organization. However, the Council of National Defense after observing the voluntary priorities plan being operated by ANMB came to the conclusion that priorities would play an important part in defense production and by order of Council October 1940 established a Priorities Board with Donald Nelson as Administrator.

By executive order a little later this board was empowered to place priorities for Army and Navy orders on a mandatory basis. Uniform regulations, essentially the same as the ANMB system, were established and the Army and Navy Munitions Board was made responsible for priorities on critical items.

This Priorities System went through many growing pains but throughout the war the Army and Navy Munitions Board Priorities Committee was one of the most important factors contributing to its successful operation.

The difficulties encountered by ANMB were accentuated by the confusion resulting from the establishment of various governmental agencies, often with overlapping or conflicting functions. A study of the chronology of WPB and its predecessor agencies is very interesting.

Up to this time the development of governmental machinery for supervision of economic resources for war, had placed primary emphasis on production. Distribution for the most part was uncontrolled.

Important events were occurring so rapidly that governmental organization required appropriate adjustments. In March 1941, Congress had passed the Lend-Loase Act. In April the President established the Office of Price Administration and Civilian Supply. In May he set up a Division of Defense Aid Reports to administer activities under Lend-Loase, and declared an unlimited emergency.

This Plethora of boards and committees caused dissension between certain of the operating divisions of OPM and between OPM and the Army and Navy, as might have been expected.

In August 1941, the Supply, Priorities and Allocations Board (SPAB) was set up as a policy-making Board with Mr. Nelson as Executive Director.

As in previous organizations, the authority was given to SPAB as a group and not to a single individual.

With the exception of Civilian Supply, the Secretaries of War and Navy, were included in all the emergency organizations set up. Presumably through these channels, the War and Navy Departments were expected to participate in policy determinations of all these agencies. However, the War and Navy Departments had liaison relationships only, and were denied direct participation in the operation of the agencies. Established policies were frequently rendered ineffective at the operating levels.

In the fall of 1941, the War and Navy Departments realized the necessity for getting closer to the center of the governmental emergency organization. The Under Secretary of War and the Under Secretary of the Navy decided that the Army and Navy Munitions Board, reorganized and strengthened, would be the proper medium for this purpose.

In October 1941, Mr. Eberstadt was called to Washington to study the possibilities of using the ANMB for this purpose. Before his report was finished, it began to look as if the existing emergency agencies were about to fall apart and the Under Secretaries' original idea was extended to include the possibility of ANMB actually taking over the job of industrial mobilization. This of course was the idea of the Industrial Mobilization Plan of 1939. "If the creation of the War Resources Administration is delayed, the Army and Navy Munitions Board should assume the responsibility for guidance during the transition period. Upon creation of the War Resources Administration, personnel and records of the Army and Navy Munitions Board should be used to assist in forming the nucleus of the new body." In other words, the idea was to start over, on the basis that the loose structures of OPM and SPAB would not stand the stress of war and that ANMB would function until an organization similar to the War Industries Board might emerge, headed by a single individual with broad powers.

Mr. Eberstadt's report on ANMB recommended a number of changes including the appointment of a "carefully selected, well-qualified non-political chairman" to act as Chairman of the Executive Committee, which was to be reconstituted with a high-ranking Army and a high-ranking Naval officer appointed to do full-time duty with ANMB.

This report was approved by the Under Secretaries and Mr. Eberstadt was appointed as Chairman of the Executive Committee of ANMB. There was considerable delay in obtaining White House approval, as was considered necessary, due apparently to the fact that a shake-up in OPM and SPAB was under consideration at the time.

Before this approval was received we were at war and the President had established the War Production Board. As then constituted, the Board was composed of Mr. Donald Nelson, Chairman, the Secretary of War, Secretary of the Navy, Secretary of Commerce, General Knudsen for Production, Sidney Hillman for Labor, Leon Henderson for OPA, Henry Wallace

for the Board of Economic Warfare and Harry Hopkins, Special Assistant to the President. In setting up WPB the President delegated broad powers to it and made the chairman responsible for the general direction of war production and procurement.

The Armed Services were much heartened by this shake-up as this superagency approached the 1939 conception of the War Resources Administration.

When joint letters were issued setting forth the functions and mechanisms of this coordination between the Services and WPB, it seemed that we had, at last, well-oiled machinery to carry on the war effort-- but as before there was difficulty getting in at the operating level.

Mr. Eberstadt as Chairman of the ANMB vigorously advocated the interest of the military at every level of WPB, and achieved considerable success. When it began to appear, after several months, that WPB was not as "tough" on nonessential production and in the distribution of critical raw materials as it should have been, Mr. Eberstadt was appointed as Program Vice Chairman and Chairman of the Requirements Committee of the WPB. In accepting these positions in August 1942, he resigned from ANMB.

One of his first acts after moving to WPB was to direct that space be made for the personnel of ANMB in the buildings where WPB was housed. This, of course, was of immeasurable value to the Services. We were really on the inside, and in a position to set forth promptly the effect on the service of almost every decision which had to be made. Until June 1943, the influence of ANMB with the top commands of WPB was an important factor in major policy decisions.

Under the reorganization order 28 July 1943 signed by the President, the Army and Navy Munitions Board in a large measure ceased to function as the joint Army and Navy liaison with the War Production Board, priority administration and clearance of proposed regulations being the principal functions left. It also continued supervision over the stock pile of strategic and critical materials. Since VJ-day the ANMB has again assumed its broader functions under a new charter approved 18 August 1945. Plans for the functioning of the board under its new broad powers are now being formulated under the direction of a civilian chairman, Mr. Richard R. Dupree, appointed 1 April 1946.

It was exceedingly unfortunate that the WPB could not have been established in May 1941, when the President declared an unlimited emergency. We would have had several months jump on the problem we eventually had to face. But even a declaration of unlimited emergency apparently did not openly imply actual fighting. Whether we would have actually gone to war if Japan had not attacked us at Pearl Harbor, is still a matter of conjecture, as recent testimony before the Pearl Harbor Committee of Congress has, I think, shown.

I have perhaps bored you with a recitation of some of the difficulties which the Army and Navy had to overcome in getting their programs rolling. I might say in passing that the Services themselves could not at that time envision the expenditures which were to be found necessary to fight a global war.

We did not foresee soon enough the advisability of extending the Industrial Mobilization Plan to include raw materials, or to the organization of subcontracting, or to the necessity of training workers for defense plants. The astronomical sums appropriated for and expended by the Army and Navy for material from 1 July 1940 to 1 July 1946, (some 200 billion and 130 billion, respectively) could hardly have been foreseen by the wildest spender we ever produced.

However, despite these difficulties, there were numerous definite benefits resulting from the united front of the Army and the Navy.

I have mentioned that the Priorities System was one of the fundamental concepts of the Industrial Mobilization Plan. The primary function of a priorities system, is of course to set up a facilitating and control procedure so that strategically important needs are assured to the Armed Services with a minimum delay.

As first set up by the Priorities Committee of ANMB, preference ratings were AA (reserved for emergency use to be assigned only by the Priorities Committee of ANMB) and A-1, A-2, etc. up to A-10. As early as November 1940, it was necessary to divide the A-1 band into A-1-a, A-1-b, etc. By early 1942, the A-1-a band was so congested that a new series of ratings AA-1, AA-2 to AA-5 was created.

There were also established special rating devices which consist of out of line ratings (i.e. a rating higher than one authorized under Priorities Regulations, Program Determinations, ANMB directives, etc.) and special directives which "spot schedule" production. The experience of the First World War demonstrated the need of an instrument which would by means of special priority ratings or by means of directive, pick out certain procurement and give it the right of way. It is obviously impossible to anticipate in other than general terms the many emergencies which can arise. For example, the Navy recognized that its vessels would receive damage in battle and made provision for necessary replacement parts and repair materials, but could not anticipate the extensive damage which resulted from the Pearl Harbor disaster. It was recognized that in the maintenance of the production facilities there would be a constant series of replacement and a certain number of unanticipated breakdowns, but a complete set of spares for every machine could not be contemplated. It was recognized that certain production facilities would have to be greatly expanded, but the extent of the expansion for 100 octane gasoline or the Synthetic Rubber Program was not anticipated. All of the above cases were entitled to and received special advantage.

The special devices found most useful were the AAA (AA prior to 12 June 1942) and the WPB directive.

The AAA rating under the authority of the Priority Regulations was a demand on a supplier--it required him to use material and labor in his possession on the project given the AAA rating.

A directive on the other hand is an instrument of usually limited scope in that it requires the performance of a definite service usually within a definite time.

During the early period of the emergency the administration of the AAA, and directives also, was in the hands of the chairman of the War Production Board. In the period prior to 12 June 1942, it was the policy of the chairman to delegate this authority rather widely which resulted in a harmful inflation of the entire rating structure.

To combat this inflation, a Special Ratings Division was set up with a WPB, an Army and a Navy representative. This group worked out criteria on which to base its decision as to whether or not an AAA rating should be granted.

A very important part of the special rating procedure, of course, consisted in getting the claimant agency whose project would be delayed to give way. WPB could override a claimant who would not agree to a delay, but the claimant had his day in court and most cases were settled by agreement. Frequent reports were published which allayed fears that the rating structure was being inflated.

From the first of August 1942 to the end of December 1944, some 83,000 cases involving about 650 million dollars were processed.

Directives were put on by the War Production Board generally at the request of the Joint Chiefs of Staff and involved usually large programs such as the 100 octane and rubber programs mentioned before, landing craft, certain artillery and shell programs, etc. When this directive mechanism was initiated, it ran roughshod over other programs. The resulting confusion necessitated better screening, which was eventually applied.

The influence of the Army and Navy on the priority system from the beginning was tremendous. The Priorities Committee of the ANMB continued to function throughout the war and still has certain priority functions delegated to it by CPA, the successor of WPB.

As long as munitions could be produced with interference only with unrated "business as usual," the preference rating system alone was sufficient. But when the munitions program grew to such size that there were not enough raw materials and manufacturing facilities even for munitions, other controls were necessary to provide insurance that materials and products would be available to flow under the guidance of priorities.

In the fall of 1941, we find Mr. Nelson, (when he was Director of Priorities in SPAB) quoted in "Fortune" as follows: "As I see my job," said Mr. Nelson, "it is to destroy an illusion. The people of the U.S. have been living in the comfortable belief that after we had armed ourselves and supplied the rest of the anti-Hitler world with guns from the arsenal, we could get along fine with what goods were left. The U.S. was a big barrel, and when first the British and the French and then our own Services reached in and dipped out their handfuls, nobody missed what they took. Now we are getting near the bottom of the barrel. There are only a few handfuls left and somebody's got to give way, the Civilians or the Military."

When Mr. Nelson made this statement, war production was about a billion dollars a month, having risen to that figure from about three hundred million a month in July and August 1940. Soon after he made his statement, we were at war, and there was no choice but that the civilian economy would have to give way to the military. Also it became apparent that we needed a much bigger barrel and a better mechanism for control.

The Production Requirements Plan was adopted in the second half of 1942. This was a combined preference rating and allocation system whereby manufacturers were assigned quarterly preference ratings for definite quantities of material to be used by them during the three-month period.

The operation of this plan, together with the mechanism of the preference rating system, proved inadequate since they were not based on any realistic programming of production. They did not channel raw materials into the quantity and kind of components required for the end products needed first. The failure of these two types of control accentuated the necessity for definite end-product programming and the gearing of production controls to such programs.

The root of the trouble was the fact that the procuring government agencies were placing contracts for their maximum requirements governed only by the dollar value limitations placed by congressional appropriations. There was no central control over the amount and location of orders. Since each agency wanted as much equipment as it could procure and let contracts to its limit, the demands shortly exceeded the supply of materials and facilities.

The saying attributed to Admiral Blandy "It is a misdemeanor to have too much, it is a crime not to have enough" was being overworked.

Thus it was imperative to have a system which would simultaneously allot materials and control programs and schedules.

During the summer of 1942, a group of representatives of the Army, Navy and WPB entered into an intensive study of past plans and suggested plans, as well as a study of controls used by our Allies and our Axis enemies.

The Services took a very active part in these studies and the Controlled Materials Plan adopted was quite similar to a "Warrant Plan" advocated by the Navy before PRP was adopted. On 2 November 1942, the WPB announced its plan for controlling the distribution of steel, copper and aluminum--the three basic materials needed for war production. The Controlled Materials Plan became fully effective on 1 July 1943.

CMP required the claimant agencies to report their quarterly controlled material requirements on the basis of planned programs to the Requirements Committee of the WPB. The Requirements Committee critically examined each of these and compared the total requirements for each

controlled material with the estimated available supply as reported to it by the Materials Division of WPB. If it was found that demand exceeded supply, the Requirements Committee reduced the allotments of certain claimant agencies and required them to adjust their programs accordingly. In the case of military requirements, the opinions and wishes of the Joint Chiefs of Staff were given full weight. However, the directives of the Joint Chiefs of Staff related to programs, such as a number of destroyer escorts or tanks of 155 mm howitzers. Translation of these programs into quantities of steel required for instance, was done at a considerably lower level and the tonnage demanded by the services was not always allotted, but in most cases it was, particularly after estimates of requirements by the Services were closer and closer to actual needs.

The Claimant Agencies made adjustments in their own programs as dictated by reductions from the Requirements Committee level and allotted materials for the scheduled programs. On this basis, together with the statements of prime contractors of their specific requirements, plus comparison with bills of material, the claimant agencies allotted materials to the prime contractors, and at the same time specified their schedules. This system was effective down the line, each prime contractor allotting materials and authorizing schedules to his subcontractors, and they to theirs.

The Controlled Materials Plan made probably the most important single contribution to the marshaling of our industrial resources for war production. It solved or contributed to the solution of many serious difficulties relating to material shortages, uncoordinated procurement, unsatisfactory scheduling and other factors which were impeding the war effort, because it required the claimant agencies and the WPB to do more effective and longer range planning.

The success of the CMP was due in no small measure to the way the Army and Navy took hold of it and interpreted its functioning to its field services and contractors. Despite the initial weeping and wailing and gnashing of teeth at its complications and paper work, etc., it finally worked very successfully.

Priorities, preference ratings, PRP and the Controlled Materials Plan were not sufficient to insure that the munitions program would not be hindered by nonessential civilian production. It became necessary to set up various regulations to make sure that the production of luxury items was prevented, that the production of essential items was limited to actual needs and that the production of these essential items was geared to the minimum use of scarce materials. Limitation (L) orders, Material (M) orders, Equipment (E) orders, and Preference (P) orders were the principal ones issued. "L" orders were issued to prohibit or curtail production of less essential goods consuming large quantities of scarce raw materials. They included items which were altogether nonessential, those where an adequate supply existed and those made by an industry the facilities of which were needed wholly for other purposes.

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Among the examples of complete stoppage of production were passenger automobiles, mechanical refrigerators, vacuum cleaners, sewing machines and vending machines. There were many items which in limited quantities were necessary for the military or for civilian use. Quantitative production was achieved by (1) quotas laid out in an order, (2) authorizing production only on orders screened by WPB, (3) production for certain uses, and (4) limiting inventories of producers and suppliers. Typical restricted production included electrical appliances, cutlery, portable electric fans and domestic laundry equipment. Other orders limited transfer or sale of products remaining after production was stopped or restricted. And finally certain "L" orders required simplification or standardization of end products which had been "dressed up" with various frills. Examples were hand service tools, glass containers and industrial power trucks.

Material (M) orders allocated raw materials or prohibited or limited their use to specified essential purposes. Practically all scarce materials except steel, copper and aluminum were controlled by allocation orders.

Production scheduling was a type of control effected sometimes by "L" and sometimes by "M" orders. The purpose of this control was to relieve bottlenecks which frequently resulted where the same type of component was used for several programs. WPB with the aid of the Services examined and rearranged schedules of production to relieve bottlenecks and "froze" the schedule. M293 was a good example covering critical common components. Direction 3 to M-293 was a special direction issued to cover spare parts for internal combustion engines when they became critically tight in 1945.

Equipment (E) orders controlled the distribution of equipment, chiefly machine tools and cutting tools.

Preference (P) orders were originally issued to assign a preference rating to an entire industry or to a particular manufacturer thereby saving the paper work incident to frequently recurring requests for individual ratings. Like preference ratings they did not insure tight enough control over the quantity of materials to which ratings could be applied. Most of them were cancelled or allowed to lapse.

"R", "T" and "U" orders covered for rubber, transportation and the utility field what "L" and "M" orders did in other fields.

The Army and the Navy had a great deal to do with the issuance of these orders. An order was usually initiated by an Industry Division in WPB. While each division had experts on its particular industry, they were not sufficiently informed as to the materials and products under the cognizance of other WPB industry divisions to make final decisions which might affect them, nor were the Industry Division informed as to the planning for the entire war effort and its requirements in terms of facilities, materials and manpower.

Because of this, WPB required that an order proposed by a division be circulated to other interested divisions in WPB and then be considered by

a WPB Order Clearance Committee. The Army and the Navy both had representatives on this committee and these two officers also comprised an Army and Navy Munitions Board Clearance Committee. The clearance activities of the Army and Navy were physically located in the same quarters and coordinated their activities in the name of the ANMB Clearance Committee. While proposed orders were being circulated in WPB, they were also being circulated to interested Bureaus, offices and technical services in the Army, Navy and Maritime Commission. From the resulting comments and recommendations, it was ascertained whether or not the proposed order would help or hinder the war effort. A united front of the Services was always presented and our knowledge of the subjects was such that, as I remember, 90 percent of the orders issued by WPB came out as the Services wanted them. Results obtained through control were unusually good and much of the result was due to the active participation of the Army and the Navy as a coordinated unit.

ALLOCATION--One of the concepts of the Industrials Mobilization Plan of 1939 called for the allocation of manufacturers to one service or the other, or to both in some cases for the manufacture of specific products.

Some twenty thousand plants in the United States had been surveyed by the Army and Navy Munitions Board so that what a company could make, how much it could make, and what machinery it had to make it with was well known.

Lists were in hand ready to be implemented on M-Day, but they never were used as intended. M-day really happened long before Pearl Harbor. Plants which had been allocated to the Army or the Navy were being given business from abroad and frequently filled to capacity before our Army or Navy had appropriations to place business with them. The priority system established in August 1940 by the ANMB for regulating the delivery of critical material through the assignment of preference ratings was considered by the Navy as outdated the allocation of individual facilities as a means of priority control, and in July 1941, the Secretary of the Navy issued a letter to the Bureaus of the Navy that naval participation in the allocation of private production facilities was abandoned. The allocation plan was to be considered by the Navy as a plan only, having no effect upon procurement activities in the emergency which existed then, unless invoked by mutual agreement between the War and Navy Departments, and subject to review in light of conditions existing at the time.

Undoubtedly, by the summer of 1941, the allocation scheme was outmoded but that was due to the situation existing in the country at the time and the realization that the productive facilities of the country had to be augmented in all directions to take care of the munitions load which was increasing month by month. It might be said also that the Navy had never entered into the scheme as wholeheartedly as it might have. The studies made of the various plants were of inestimable value to the procurement officers of the Army and Navy, however, and while the plan had been officially abandoned by the Navy, there was a great deal of allocation done, at the working levels by informal agreement.

I believe that an allocation plan is extremely valuable and should be made up again. Out of our experiences in this war, we of the Services will be able to keep a program of requirements for the next war up to date, and with this knowledge allocation of facilities can and undoubtedly will be made.

REQUIREMENTS--Complete coordination by the Army and the Navy in the formulation of requirements for materials and components was not achieved during the war, and war being what it is, probably never could have been achieved even if better mechanisms for coordination had been developed.

I will not attempt to discuss here any faults which might have existed at the Joint Chiefs of Staff level in the consideration of over-all logistic requirements.

Suffice it to say that the papers emanating from the Joint Chiefs of Staff did not provide a sufficiently coordinated and detailed basis upon which the Services at the production level could plan for a logical sequence of procurement, and throughout the war requirements were generally computed separately by the Army and Navy, except for aeronautical equipment.

Much coordination, however, did take place at levels below the Joint Chiefs of Staff generally in areas where materials were critical, and particularly where the requirements of one service were directly dependent upon the activities of the other, as in the case of attack transports and supply vessels and of items procured by one service for use by the other.

Many examples of this coordination can be cited. The Central Procuring Agency staffed by Army and Navy Officers was created to purchase lumber nationally and to allocate it between the Army and the Navy.

The AAF and the Bureau of Aeronautics cooperated effectively on their requirements for airframes, engines, propellers, etc, these items making up 76 percent of the aeronautical program for the two Services. This 76 percent of the aeronautical program amounted to over one-fourth of the entire munitions program (dollar wise) from 1 January 1942 to 1 January 1945.

The Army and Navy Petroleum Board coordinated the requirements of the Army and Navy for fuel and lubricants.

High octane gas requirements were coordinated by the AAF and the Bureau of Aeronautics in so far as possible. Month after month past experience became obsolete, so that the estimated requirements were faulty but at least they were coordinated.

Electronic requirements were coordinated under the Joint Communications Board through its Procurement Precedence of Supplies Material and Equipment Committee which formulated a precedence list. The Army

and Navy Electronics Production Agency (NEEPA) directed production in accordance with this list until the summer of 1944, when it was abolished as no longer necessary.

Antifriction bearings, wire rope, cotton broad woven fabrics, truck and bus tires, rockets, dry cell batteries, ammunition brass and many items in short supply (in addition to steel, copper and aluminum) were fields in which requirements were coordinated and spelled out in order that the War Production Board could increase facilities and insure additional supplies.

This coordination of requirements, such as it was, was arrived at only near the close of the war. Much better coordination will be necessary if, unfortunately, we again have to face an all-out war effort.

FACILITIES AND CONSTRUCTION--It became apparent very shortly after the emergency descended upon us, that the industrial facilities existing in the country were entirely inadequate to produce the munitions needed for the global war in which we were to find ourselves. That was a cause of astonishment, for no one believed that we would ever be short of raw materials or the fabricated products made from them.

The coordination between the Army and the Navy in regard to facilities needed for production was anything but complete in the early stages of the war. In some fields, coordination was unnecessary, of course, as for example, in facilities for shipbuilding and for Army arsenals and Naval Establishments. In other fields there was quite complete coordination as for airplanes where AAF and the Bureau of Aeronautics had joint interest in facilities expansions.

There was a substantial amount of facility coordination where the procurement for both Services was turned over to one service or the other. The Army produced almost all the powder and explosives for both Services. Practically all trucks were bought by the Army also. The Navy purchased most of the fuel oil and lubricating oil used by both Services.

There were many cases of interchange of facilities among the Army, Navy and Air Forces. All have come about by close coordination at headquarters where information was exchanged, needs developed and final paper work adjusted.

There was a constant interchange of information between Army Ordnance and the Bureau of Ordnance in the Navy Department in regard to facilities. This had gone on for some time before we entered the war. The effort here could be coordinated because of the great similarity in many of the items to be procured.

In November 1941, the Office of Production Management began the review of Army and Navy contracts involving substantial new facilities or machine tools.

Soon after WPB was organized, a Facilities Committee was set up on which were representatives of the Army, Navy, Maritime Commission, Smaller War Plants, and War Manpower Commission and War Production Board.

This committee reviewed facilities expansions costing over \$500,000. The review covered primarily the essentiality of the projects although the proposed location was examined from the point of view of availability of manpower, and of the power needed by the equipment. Before coming up to the Facilities Committee, the possibility of using facilities made available by changes of program was inquired into by the sponsoring agency.

Facilities sponsored by the War Production Board itself usually came up from the Industry Division concerned. As the Army and Navy had representatives on each Industry Division, they had an opportunity to present the service opinion at that level before it got up to the Facilities Committee.

Most of the requests for facilities expansions by the Army and Navy had been quite thoroughly screened before they came up to the Facilities Committee, and practically all of them were approved.

In one field of the Facilities and Construction program, there was complete coordination between the Services. This was the ANMB "List of Prohibited Items for Construction Work."

It was prepared and maintained current in joint sessions between the Production Division of ASF and the Production Branch of OP&M of the Navy.

At these joint sessions, Materials and Products Specialists, as well as representatives of the Corps of Engineers and Bureau of Yard and Docks, presented their recommendations from which the list was formulated. This list controlled both command and industrial construction.

MACHINE TOOLS--One aspect of the munitions program where the Army and the Navy coordinated quite fully was that of machine tools and plant equipment. The foresight of the Army and Navy Munitions Board Machine Tool Committee was responsible in large measure for getting the Machine Tool Program underway in time to avert disaster. Organized in the early 1930's, this committee formulated plans for the expansion and control of the machine tool industry in time of war. With the assistance of industry the capacity of all machine tool builders was tabulated and their possibilities for expansion analyzed; standard nomenclature in catalog form was initiated, and some progress made in the elimination of odd and unnecessary sizes of items. In the light of later developments, these plans were rather elementary and quite inadequate for total war. Particularly valuable, however, were the contacts made between the Army and Navy and the leaders of the industry. As is well known, the procedure for procuring war material in this war did not follow a prescribed plan, and it was

therefore necessary for those responsible for plant equipment to rely on their own general estimates of future requirements. When definite programs were laid down, a large volume order for machine tools could be placed. For instance when the Thousand Bomber authorization was made, the Air Forces through the medium of the Defense Plant Corporation placed orders for 200 million dollars of machine tools. Shortly after this it was believed wise to expand facilities for the manufacture of all types and sizes of tools. The composite judgment of officers of the Army and Navy, WPB and the machine tool industry determined the extent of the expansions.

Officers in the Machine Tool Division of the ANMB had realized that the forthcoming demand for machine tools must be anticipated by expanding the capacity of the machine tool industry through the placing of substantial, firm orders.

Accordingly the Army and the Navy, though without appropriations for the purpose entered into facilities and supply contracts with a considerable number of tool builders late in 1940 and early in 1941. Defense Plant Corporation (a subsidiary of Reconstruction Finance Corporation) had been organized in August 1940. Its function was to finance facility and supply contracts using funds provided by RFC. In February 1941, it made 35 million dollars available for tools. Later that was followed by 200 million dollars for the 1000 Bomber Program mentioned before. In two and one-half years it entered into some 750 contracts for tools to the value of nearly two billion dollars.

Of the nearly two billion dollars in pool orders for tools, it was estimated that cancellation costs amounted to about nine million dollars. This very excellent job of buying machine tools by DPC had the benefit of the Army's and the Navy's extensive knowledge and its success was due in no small measure to their participation.

The Machine Tool Division of the ANMB maintained close records of all pool orders and issued reports of their status. Thus it was possible not only to check production of tools under pool orders but to control their manufacture and distribution, curtailing or cancelling if indicated. The success of the entire operation reflected the cooperation and coordination between the services, WPB and DPC.

Other methods of increasing production were the use of the substantial number of machine tools placed in storage by the Army and Navy after World War I, the seizure of tools on order by France when she surrendered and the commandeering of tools on order by the Japanese--sometimes with and sometimes without adequate authority. Export controls were established and export licenses used during the defense period by the ANMB to keep needed tools in the country and to prevent potential enemies from securing them. After WPB was set up, it had a survey made of the Nation's idle equipment and centered its control in WPB regional offices where Army and Navy officers were stationed. This service contributed much to meet the tremendous demands of

subcontractors for machine tools at a time when new tool procurement for subcontractors was next to impossible.

Efficient distribution of machine tools in this war was more difficult than providing an adequate supply. The first plan of distribution was based on "first things first." The preference ratings of supply contractors was furnished to machine tool builders in Master Preference Lists. The faults of this plan were that it promoted extravagant order of tools and all deliveries of scarce tools to the highest urgency standings of the A-1-a preference rating, with the result that a few contractors had excessive quantities of machine tools, many of which stood idle for long periods, while other contractors were unable to complete their pilot lines.

The system was so unsatisfactory that the policy of "first things first" gave way to the policy of building simultaneously all elements of a balanced program. In May of 1942 General Preference Order E-1-b, developed by ANMB, was issued. Under this system 75 percent of the monthly production of each make, size and type of tool was allotted to the military and their contractors. The other 25 percent was allotted to other domestic and foreign purchasers. Of the 75 percent allotted service purchasers, each bureau and service of the Army and Navy received a quota. Each bureau and service made up its own master preference list showing the relative urgency standing of its contractors.

The immediate effect of the new quota system was to introduce economy in the ordering of tools and to permit deliveries where they were needed. The Master Preference Lists were revised at frequent intervals. Flexibility was introduced into distribution by the fact that WPB had authority to divert delivery from one customer to another.

Other examples of coordination between the Army and Navy were the issuance of letters directing the interchange of idle capacities existing in Army and Navy production lines, which were supervised by the inspection forces of the Services in the field.

In 1943 a joint letter was issued providing for the free flow of surplus machine and hand tools and other equipment between the Army and Navy without exchange of funds. This did away with a tremendous amount of paper work and permitted surpluses in one service to cover deficiencies in the other with a minimum of effort.

JOINT SPECIFICATIONS--Until we had been in the war for nearly a year, no official action was taken to set up a board to formulate Joint Army and Navy Specifications for the ASF and the Navy Department. The matter was not pursued as actively as it might and should have been, until nearly the end of the war.

Before the war there had been what might be called unofficial joint specifications, as each service procured a good many items for the other. Acceptance of these items as satisfactory naturally carried with it, approval of the specifications upon which they were purchased.

The common interest in specifications relating to aeronautical material, however, was recognized by the Army Air Forces and the Bureau of Aeronautics as early as 1927. A program of ANA specifications was launched then, and it has continued to be active ever since.

There are in effect today over two thousand ANA specifications, drawings and bulletins of acceptable products.

The following types of specifications are in use by the War and Navy Departments:

Federal specifications promulgated by the Treasury Department. The Army and the Navy both have representatives on the Federal Specifications Committee and have been instrumental in reviving this agency, which was more or less dormant for years.

U.S. Army specifications as developed by the Technical Services.

Navy Department specifications as developed by various Bureaus.

Army Tentative and Navy Bureau Interim specifications were used by individual technical services or bureaus for "one shot" requirements, for use while final specifications could be developed after a period of trial and error.

U. S. Army Specifications and Navy Department Specifications had been prepared separately for years with practically no coordination until a Joint Army-Navy Committee on Specifications was created in December 1942 by a directive signed by General Somervell, and Admiral Robinson. AAF and BuAer Aeronautical Specifications were not included in the purview of this Committee.

The efforts of the committee brought forth some fruit and there was technical specification coordination in respect to a number of items such as electronic tubes, textiles, chemicals, plastics and photographic material. For a variety of reasons, the work of this committee was not pushed as it should have been. Only 127 joint specifications were promulgated in the first two years of the committee's life, although they covered thousands of items.

The unsatisfactory conditions were recognized and after many conferences between the Army and the Navy, a new organization was set up.

The precept of this new organization was signed by the Secretary of War and the Secretary of the Navy, and thus brought in the Army Air Forces and the Bureau of Aeronautics. (Except for items for which the procurement responsibility and use rest solely in the Army Air Forces and Bureau of Aeronautics or either of them, and those materials and processes for which there is a peculiar aeronautical requirement.)

A Specification Council and a Specifications Board were set up under the ANMB, the intent of the directive being to establish between the War and Navy Departments a joint organization for promulgating,

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administering and policing specifications which will be utilized by all procuring agencies of the War and Navy Departments. This joint council and board superseded the previous JAN Specification Committee.

As can be imagined, there has been difficulty in getting such an organization rolling. The Specification Board has twenty-two members, comprised of an executive committee of four members appointed by the Secretaries of War and Navy and eighteen members from the technical services of the Army, Army Air Forces and Bureaus of the Navy Department, Marine Corps and Coast Guard.

However, the organization is a going concern. The field to be covered in joint specifications has been explored, those specifications of the Army and Navy which will lend themselves to joint action have been listed and a priority for consideration has been established.

In January of this year, a five-year objective covering the activities of ANJSB was promulgated. This covered the processing of the two thousand to three thousand specifications considered by the technical services as capable of being developed into JAN or Federal specifications. It also provides for the continual revisions of existing JAN specifications to keep them current with technological developments and changing military characteristics.

The importance of getting together on joint specifications cannot be exaggerated, and every effort should be made by the technical services to expedite their formulation. Not only are joint specifications highly essential for joint procurement, but even without joint procurement, we should not lay ourselves open to criticism by having common articles vary enough in their specifications to confuse and irritate manufacturers.

Closely connected with the matter of joint specifications is the matter of inspection of materials and components purchased under these joint specifications, as well as under other specifications.

Coordination of inspection between the Army and the Navy has been made very difficult because of the differences in inspection policy in the Army Service Forces and the Navy. These differences exist in a great many fields such as subcontract inspection, contractors' Certificates of Compliance, differences in scope of duties in naval inspection offices and ASF Technical Services offices, inspection forms, etc.

At the operating level, there has been very good coordination particularly on items covered by JAN specifications or ANA specifications.

On such items no technical difficulties were involved, but the inspection policy differences mentioned above complicated the taking over of inspection by one service for the other. However, a great deal was accomplished in this area.

For instance, the Signal Corps and the Bureau of Ships divided inspection of certain electronic material; the Petroleum Section of the

Bureau of Ships and the Fuels and Lubricants Section of Army Quartermaster Corps divided inspection of petroleum products. Complete coordination was achieved in the inspection of strictly aeronautical material between AAF and BuAer, Navy.

There were such differences in inspection policy that plant by-plant coordination was about all that could be done during the war.

Inasmuch as the question of inspection is so intimately connected with the formulation of joint specification and joint procurement, the Army-Navy Joint Specification Board might well take up the question of reconciling the differences in policies, organizations and procedures existing in Navy and Army Inspection.

Such a reconciliation of differences will assist still further in improving the attitude of suppliers toward the Services.

MANPOWER--Manpower to operate the colossal industrial machine which is the backbone of modern war was just as important to us in the production job as the facilities themselves.

This phase of industrial mobilization, however, was the last one to receive serious attention in the governmental emergency organization. There were several reasons for this. At first there was no real problem with the over-all supply of labor. Although there were shortages in certain skilled trades, many training programs conducted by various agencies were fairly successful for a time in easing the situation. In the early part of 1942, due to the draft of men to the Armed Forces and the expanding demands of industry, an over-all manpower shortage began to develop and showed signs of becoming increasingly critical. A central authority to deal with labor supply was necessary. When the WPB was established, the Labor Division under Sidney Hillman had attempted to coordinate labor supply and training, but the problems were becoming so complicated with the number of agencies involved that the situation got out of hand. Everyone recognized the necessity of some real authority set up by the Congress or executive order to cope with the problem.

Many were of the opinion that such an authority should be set up in the WPB in order that manpower for the Armed Services should be in control of the agency responsible for production of munitions.

However in April 1942, the War Manpower Commission outside of the WPB was established by executive order, with Paul McNutt as chairman. Representatives of the War, Navy, Agriculture, Labor Departments, the Labor Production Division of the WPB, the Selective Service System and the Civil Service Commission made up the WMC. Authority and responsibility were vested in the chairman, who was charged with the formulation of plans, programs and policies with respect to the mobilization of manpower, including estimates of requirements for industry and for the military, as well as for the training of industrial workers and the distribution of all available manpower.

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Even with this apparently compact and centralized administration, the manpower feature of economic mobilization was much more complicated and difficult than that for material resources. The WMC never had adequate authority to enable it to do this obviously necessary drafting of labor for essential war jobs, and the situation with regard to manpower remained muddled until the end of the war.

Early in 1945, the shortage of labor in the raw material industries--coal, steel, copper, lead and zinc to mention only a few--was enough to affect the production of end products. If the war against Germany had not ended when it did, I believe that a National Service Law would have been necessary to keep our war machine rolling.

To assure that manpower problems which might threaten production schedules were given remedial action promptly, the Army and Navy established manpower organizations to work with the WPB and WMC. The service organizations were set up to assist the civilian agencies by giving them information developed by our field organizations and by evaluating the effect of proposed plans and policies upon procurement.

The service organizations were needed also to assure, within the Army and Navy, compliance with the regulations as issued by the civilian agencies and to interpret these regulations to their suppliers.

On 4 September 1943, the Office of War Mobilization announced a program designed to meet war and essential civilian manpower needs which was applicable to the west coast where labor shortage had become most acute. Subsequently, this program was extended to all critical labor areas throughout the United States. In substance, it provided for the establishment of Area Production Urgency Committees in each critical labor area under the chairmanship of a representative of the WPB with membership from the interested procurement agencies. The committee was empowered to establish relative urgencies within the areas for manpower in accord with directives from the Production Executive Committee of the WPB. There was also established in each area a Manpower Priorities Committee under the chairmanship of WMC which was empowered to establish ceilings of employment in manufacturers plants, to control referrals by the U.S. Employment Service, and to assure the proper utilization of manpower within the area. The Army and Navy usually had the same representative on both committees.

At first these committees were set up in areas designated Group I and Group II. Group I being where the situation was already critical and Group II where the situation was stringent and liable to be critical within six months. Later Group III areas where supply and demand for labor was in balance and Group IV areas where a labor surplus existed were designated and Production Urgency Committees were established in these areas.

Other phases of the labor problem aside from labor supply which might interfere with war production were handled by the National War Labor Board for labor disputes and wage cases; the National Labor Relations Board for labor relations; and the National Selective Service

System for draft deferment matters. The Army and Navy had active representation with these agencies.

One field where the Army and Navy were particularly active was in the formulation and policing of the National Production Urgency List--the so-called "must" list.

Back in 1943, the WMC sent out a list of essential activities. The list was supposedly to be used for labor referrals but its use for that purpose was not wholehearted. It was used primarily as a guide for Selective Service Boards in drafting men into the Services.

In November 1943, the War Production Board got up a list called the "General Production Urgency List." This was an attempt to put into seven groups the relative urgency of production. In March 1944, the Production Executive Committee of WPB issued a list of thirteen highly urgent programs, which was to be used as a guide by local Production Urgency Committees. By September 1944, there were thirty-nine programs on this list and the WMC said they just could not find enough labor to refer to the companies involved--200,000 men were necessary for the manufacturers of "must" items.

The list was boiled down to a smaller one by the Petroleum Executive Committee in October 1944, (nineteen programs), but at once it began to grow again as every industry wanted to get on the "must" list. During the last year of the war, the Navy advocated the abolition of the list entirely, with the exception of those items on which explicit instructions had been issued by the Joint Chiefs of Staff. The Navy's stand was that local committees were in a better position than anyone in Washington to determine which contractors should be on a local "must" list.

Another coordinated effort in which the Army and Navy had a large part was the Joint Program Information Committee. This committee was set up by the WPB and WMC jointly in February 1945, to develop cooperative programs when the need arose for the dissemination of information on special programs, by Production Urgency and Manpower Priorities Committees in local industrial areas, particularly Groups I and II.

The committee was set up because broad national publicity on manpower and production began to lose its effectiveness and it was thought that publicity should be considered in terms of local areas in which production and manpower deficits were important.

Case histories on various subjects such as railroad workers, lumber, repair of battle damaged ships, etc. were prepared in Washington pointing up manpower needs. The motto was "Pinpointed for specific skills, authenticated by local and Washington facts, fully explained to the Community." Newspapers and the radio were most cooperative in publicizing the data given them by the local committees, which took the Washington information and added the local color. Army and Navy representatives generally spearheaded these Joint Program Information Committees.

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Coordination between the Army and Navy on manpower was, on the whole, continuous, effective and harmonious. There was complete interchange of information between the parallel organizations of both departments on all matters of common interest. Directives and instructions were exchanged; ideas concerning basic policy positions were discussed informally and usually resulted in the issuance of similar policy instructions on labor supply and labor relations matters. It was continuously emphasized at conferences and in operating instructions that Army and Navy representatives should attempt to reconcile any competing manpower demands before meetings, so as to present a united viewpoint to the committee.

It was inevitable, of course, that there should be competition between the Army and the Navy for manpower, since both Services were major claimants for what was available. Directives from the Joint Chiefs of Staff as to the relative importance of top programs resulted in the acquiescence by one service to the prior claim of the other. Although both Services vigorously pursued the common aim of obtaining the manpower necessary to meet production objectives, there were no major instances where conflicts were not settled either at the department level or in the field, and generally amicably.

PACKING AND PACKAGING--Prior to the entrance of the United States into the war, the Armed Services had given insufficient consideration to the packing and packaging problems which eventually proved to be of vital concern to all agencies. Packaging as used commercially and domestically and for prewar export was found to be well developed, but lacking in those essentials which were necessary to pack and package against the hazards of wartime handling and transportation conditions, extreme climatic conditions and long term unprotected storage in the open. It is unfortunate that the development of amphibious warfare did not give more consideration to what would happen to stores and equipment landed on open beaches under fire, particularly in the tropics.

Losses in the early part of the war due to inadequate preservation, packing and packaging and primitive methods of handling reached staggering proportions. In many cases 70 to 100 percent of valuable shipments were lost, jeopardizing the success of major operations.

Efforts to coordinate the packaging function early in the war June 1942 were carried out by the Container Coordinating Committee of the War Production Board. Membership on this committee consisted of the Army, Navy, Army Air Forces, WPB, Lend Lease, ODT, WSA, and WFA, Treasury Department. The committee was established to coordinate the policies of the various agencies in regard to the use of containers and packaging materials for domestic and overseas shipments before most of the services and bureaus had packaging staffs. It prepared several manuals and packaging specifications which contained excellent material. The net results of the committee's action were rather weak however as it had no authority to enforce coordination and when packaging sections were established in the various bureaus and services they did not actively support the committee. Each bureau and service

had full authority over packaging of the material under its cognizance. Consequently, due to a variety of reasons including ignorance, desire for autonomy and rather smug self-satisfaction, policies varied from accepting "commercial packing" to the specification of packaging which was overly elaborate and expensive.

Conditions improved of course as reports came in from the fighting fronts and verification of the conditions existing was made by packing specialists from the procuring agencies. These specialists in packing were obtained from civil life usually commissioned in the Army and Navy, and very generally knew their stuff.

Finally in the latter part of 1944, a Navy Packaging Board and an Army Packaging Board was set up by the Navy and ASF respectively, and early in 1945 a Joint Army Navy Packaging Board was established. The individual service boards were composed for the most part of packing specialists as was the Joint Board.

The coordination of the work of these three Boards was excellent and resulted in Joint Army-Navy Specifications and Packaging Instructions which if carefully followed would permit the laying down of equipment in operational areas with a five percent loss as a maximum.

The personnel comprising the boards was highly skilled, enthusiastic and broad-minded. Small differences of opinion were not permitted to delay the promulgation of a specification. Time limits were put on the discussion of specifications and agreement of those involved was generally obtained most expeditiously.

Problems of packaging were attacked from an over-all War and Navy Department aspect, rather than from an Army service or Navy bureau point of view, and this esprit de service, so to speak, had much to do with speeding up the work. Chiefs of Navy bureaus and Army technical service cooperated fully in the work of the boards and insisted on the same full cooperation from everyone under their command.

By the end of 1945 practically all procurement common to the Army and Navy was standardized as to preservation, packing and packaging procedures.

The Secretaries of War and Navy have directed that joint packaging effort be continued in the Army and Navy Joint Specification Board under the direction of the ANMB.

Such continuing coordination is necessary in order to adjust to the less rigorous conditions of peacetime and to take advantage of new and improved developments constantly occurring in the fields of containers, dehumidification agents, rust preventives, moisture-proof barriers and the like.

It will be necessary for the ANMB to insist on this continued and flexible coordination, just as it must for joint specifications

in other fields, as the tendency on all sides in times of reduced personnel is to cut down on what shortsighted and mistaken people call "frills."

CONSERVATION--Conservation in its broad sense covers practically the whole field of production, embracing materials, facilities, labor, transportation and power, through the stages of design and specification, requisition and purchase, manufacturing processes, and distribution.

A great many of these items are outside the purview of this talk today. Coordination which existed in regard to some of the items has already been covered.

Most of the work done by conservation groups in the two Services was in regard to materials. The Conservation Committee of the ANMB provided the principal means of joint action in conserving critical materials until August 1942 when the committee ceased to function actively as such. Informal cooperation continued between the Conservation Branch in ASF and the Conservation Division in OP & M (Navy).

Conservation directives were exchanged and frequently discussed prior to issuance.

Conservation groups in the two Services were instrumental in getting joint action on specifications and packaging under way.

Lists of critical materials were published by the Army, Navy and the WPB though often they were not identical. It was only near the end of the war that a combined "Critical Materials List" was issued.

The conservation personnel assisted in the preparation of the "List of Prohibited Items for Construction Work."

The Army and Navy groups cooperated in issuing procedures in regard to reclamation work in the fields such as salvaging lumber, reworking critical components, and reclaiming petroleum products.

Material Regulations (Morders) proposed by the W.P.B. were cleared with the conservation people before issue.

The best example of coordination in conservation was that of the Operating Committee on Aircraft Materials Conservation. This committee made a definite contribution to aircraft production. It had representatives from the AAF, Bureau of Aeronautics, Navy Department and WPB. Set up in 1942, it issued some 100 mandatory directives and bulletins to the aircraft industry as the sole agency acting on joint conservation problems, and succeeded in obtaining hearty cooperation from all hands.

Another example also in the aircraft field, is the Committee on Materials Research Coordination established in early 1944 to bring

to the attention of all concerned, the work being done on research for aircraft materials. The committee was established under the aegis of the National Advisory Committee for Aeronautics and had representation from AAF, BuAer, CSRD and the Aircraft industry. It helped bring order and action into this very important field. The work, carried on primarily for airplanes, has much of interest to other activities of the Army and the Navy, involving as it does the supply of materials with suitable weight and strength under high temperature conditions.

In concluding this talk, I think it is very evident that a very cursory examination of our industrial mobilization during this last war points up a great many faults which must be corrected. We threw together a creaking machine with badly cut gears, lubricated at times it seemed with red lead and emery, with too many steering wheels and operated over a very rough road. It was fortunate for us that we had time as we went along to redesign the machine, get the proper lubricants and resurface the road. I think the country realizes how lucky we were to have had that time. It also realizes that, in view of the latest developments in war weapons, the next time we face an emergency our survival will depend upon what we have instantly ready. As a corollary, of course, is the fact that with world-wide knowledge that we are ready, the emergency probably will not arrive.

I say that the country today realizes the necessity for readiness. How long that frame of mind will last is a question. One would think that our experience of the last few years would satisfy anyone of the necessity for having ready at all times a carefully considered and up-to-the-minute plan for coordinating the Nation's resources for an all-out war effort.

If such a plan is prepared by the military alone, however, it will probably suffer the fate of the Industrial Mobilization Plan of 1939.

Any plan to be effective must be known and approved by the country at large. Such knowledge and approval can best be obtained through the proposed National Security Council and National Security Resources Board.

These two civilian boards made up of men high enough in government to advise the President adequately and reporting directly to him would relieve the military of any suspicion of warmongering for its own aggrandizement.

The Security Council would concern itself with the formulation of foreign and military policy and would coordinate the efforts of the State Department and the Armed Forces to implement this policy. In other words, the Armed Forces must know how far we are willing to go to obtain acceptance of our policies. They then can determine how large an Army, Navy and Air Force must be maintained constantly and in what directions and in what sequence they must be augmented if war should unhappily develop.

Instructions can then be issued to the agencies concerned as to the number of ships, planes, tanks and other military equipment which the Armed Forces are to procure and the order in which it is to be procured. This knowledge will permit them to break down the over-all program into requirements for materials and components.

This information fed into the Security Resources Board through the Army and Navy Munitions Board will enable the former to establish and keep up to date--against constantly changing requirements by the Services--sufficiently flexible policies and programs which will insure the most effective use of our raw materials and their fabrication into military products.

It sounds very simple but as studies in the College are indicating it is a very complicated matter and will require unceasing efforts of this class and those of succeeding classes in this College to coordinate the requirements of the Services for any future war.

At the levels on which work for production control, cooperation, interchange of information, ability to see the other man's point of view, and the realization that a war is not an Army's war, nor a Navy's war, but a country's war, are functions absolutely necessary to success.

CAPTAIN HENNING:

I want to thank you, on behalf of the school, for a very comprehensive review of the organization of controls necessary in industrial mobilization. Your paper will be made a part of the records of the school and will be, I am sure, of value to future students.

Thank you very much, Admiral Charlton.

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(28 June 1946--200.)S