NAVY REQUIREMENTS

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GENERAL McKINLEY: Gentlemen, you had one side of the requirements problem this morning in a lecture by General Powers of the Air Force. This afternoon we are going to look at the Navy picture.

The story will be told to us by Rear Admiral Ernest L. Herrmann, who has come halfway around the world to be with us. It took a great deal of cooperation from the Commander in Chief of the Pacific Fleet to get him here.

I do not have to tell you of the speaker's unusual career with the Operating Forces, the Bureau of Ordnance, and as Chief of Logistic Plans in the Office of the Chief of Naval Operations.

I do want to thank Admiral Herrmann for coming so far to talk to us. I want to extend to him a very, very cordial welcome from the Industrial College.

Admiral Herrmann.

ADMIRAL HERRMANN: As General McKinley has remarked, I have come to Washington from the west coast to deliver this lecture. I arrived on the West Coast just a week ago from my station in China. One might infer from that that the subject assigned is one for which I have some unique or at least rare qualification. Actually the circumstances are that when this lecture was first scheduled, last April, I occupied the position of Chief of Logistic Plans, in the Navy Department, and hence was quite the logical person to address this question on the subject of "Navy Requirements," which is at the root of logistical planning for the Navy. As it worked out, shortly after that time, in fact, I was sent to Turkey on temporary duty to look at her naval establishment and to draft the naval section of the Turkish-aid program under the Greece-Turkey Aid Bill. Shortly after that, I was detached from the Navy Department and sent to the China Station to command the Cruiser Division there. I have, therefore, in the last six months, been occupied with a wide and rich variety of jobs--not, however, including logistic planning. This has given me the advantage of viewing the subject of my talk from a distance great enough to permit distinguishing the forest from the trees. On the other hand, there may be present among you some who have later information than I have on details of planning tasks which I will mention.

It seems to have been the fashion in the years following the war, in addresses on the subject of logistics, to plug the subject--for

example, by giving historical evidence of past failures attributable to lack of or inadequate logistic planning and preparation, or by citing tributes that have been paid to the importance of logistics by our highest war commanders. All of this I am sure you have heard, and the very fact that you are here is, to me, strong evidence that you appreciate the importance of logistics and need not have it sold to you.

I should like, however, to plant this thought in the same general connection, namely, the necessity of resisting tendencies to allow logistic planning agencies to bear disproportionately the brunt of reductions in personnel as our Armed Services come under ever-increasing pressure for economy. It is all too tempting to mark the cuts in those groups which seem to be doing nothing of immediate concern anyway. Who will know the difference if the logistic plan for Operation Go-and-Do is not ready by the arbitrarily assigned date? We got along without such things before World War II, so we shouldn't be too badly off if we didn't have them now. It is an insidious line of thought, and in competition with the day-by-day problems,--budgetary blitzes, and Friday afternoon emergencies--it can well result in keeping the day-by-day front covered, and the more distant but vastly greater and more vital future front left wanting.

True, great recognition has been given to logistics at all levels of our service schools. It is the major subject at our own Industrial College and is included in the courses at the National War College and Armed Forces Staff College. In the Navy it is prominently included in our General Line School and although already for a long time included in the course at the Naval War College, it has only very recently been established there on a basis of full coequality with strategy and tactics. At the Naval War College, the Logistics Course now stands on its own right on the same level with the Strategy and Tactics Course, rather than as a portion of the latter as heretofore. This was done purposely, to do two things, (1) to signify at the very highest level of naval education the coequal relationship between strategy and logistics and (2) to signify there also the interdependence of the two. To anyone who has given thought to the matter it must be evident that making large-scale strategic plans without parallel logistic planning and feasibility evaluation is like "playing house." And logistic planners must base their plans on strategic plans--when they don't have any other strategic plans they must make up their own (they then call them "assumptions"). This is better than nothing, but it is not good enough--and entirely unnecessary when you can educate strategic and logistic planners under the same roof and engender in them the habit of thinking of their own side of the problem always in relation to the inseparable other side.

Yes, we have made progress in recognizing the problem adequately in the field of military education, but the note of caution I should like

to sound here is that we must not permit what is thus gained to be confined to the academic field. It seems to happen all too often that an officer spends a year or two at a school and then fails to be placed where he can utilize what he has acquired. We need to maintain strong logistic planning agencies, staffed with officers who know what it's all about. That is the first, and perhaps foremost, logistic requirement that I wish to set forth in this talk on requirements!

As I believe many of you will appreciate, one of the biggest bugaboos in logistics is finding an adequate definition for the term. It is an intriguing term and many people shy away from the subject because it sounds very complicated--probably not within the I.Q. of a normal individual. Shortly after I joined the logistics organization of the Navy Department and was casting about for rational guidance as to what I had gotten into, I came across a reference to a book entitled "Pure Logistics." This seemed very promising, so I looked it up--hoping at least to get something authoritative in the way of a definition of the term and thus to be spared the continual embarrassment of not being able to give such a definition for the title of my job. This book did indeed devote a comprehensive chapter to the derivation of a definition for logistics, and wound up with the somewhat baroque but certainly all-inclusive definition that "logistics is all that which is not strategy or tactics." Thus the author arrived at a definition which was sure to cover everything, but without giving much information as to the nature of the various things included. I doubt that the term is susceptible of a satisfactory definition, and I believe that one would do better to explain or describe it rather than try to define it.

One such explanation was given in a little story which appeared in a newspaper a few years ago: some of you may have seen it--it goes like this:

"The science of logistics has just been explained by a general in Washington. It consists, he says, of getting the right thing to the right place at the right time--and this is the way it's done:

"A soldier in a lonely North Africa outpost was seated, watching the horizon, at 11:23 on a certain night. Another American soldier approached him, limping as if from a long hike.

'Are you Private Jones?' the second soldier asked. The first one said he was.

'I'm from the Services of Supply,' said the second soldier. 'Here's that safety pin.'

'Safety pin?' asked the first man. 'I don't need no safety pin. I button.'

The other soldier said, 'All I know is, the Services of Supply told me to deliver a safety pin to you.'

'You're nuts,' said the first soldier. 'I'm going to sock you in the jaw.' He rose to his feet--and his pants fell down.

The Services of Supply man said: 'Here's your safety pin, soldier. I don't know how the big boys figure it out, but you got to admit they know their job.'"

How the big boys do figure it out would make a long story if told down to the detail of a safety pin, but the essence of the problem is indeed getting the right thing to the right place at the right time, and we can hit some of the high spots in that problem here today.

In the Navy Department we consider logistics as having three major subdivisions, or stages, viz: (1) determination of requirements, (2) procurement, and (3) distribution. Of these, the first (i.e., determination of requirements) and so much of the third (i.e., distribution) as relates to distribution to the ultimate user comprise what may conveniently be thought of as the "military phase" of logistics--some call it the "consumer phase." The second subdivision (i.e., procurement) and so much of the third (i.e., distribution) as relates to distribution during the procurement stage comprise the "procurement phase" of logistics--or, as some call it, the "producer phase" in contradistinction to the "consumer phase." The procurement phase is a largely commercial phase of logistics in the sense that it is a phase in which civilian effort and know-how are predominant factors.

In the Navy Department, what I have called the "military phase" of logistics is a function under the office of the Chief of Naval Operations, and within that office it is the responsibility of the Deputy Chief of Naval Operations for Logistics; the Chief of Logistic Plans, under the DCNO (Logistics), is responsible for planning tasks in the "military phase." The "procurement phase" is a function handled up by the Assistant Secretary of the Navy and executed under him by the lateral Commission and the Bureaus. I will confine myself to the "military phase," with emphasis on the determination of requirements, which obviously is what calls the tune for everything else in logistics.

It would be well to note at this point that the procedures by which requirements are determined fall into two general categories. First, there are requirements which are derived directly from over-all strategic plans or from specific war plans; these would be stated as phased requirements for certain forces, which would then be translated into ships, planes, bases, etc., personnel to man them, and major programs to support them. The second general category is closely related to the first, but deals rather with demands of the operating forces for their maintenance, as developed by themselves and by the

technical Bureaus; it has to do with such things as requisitions from units at sea, requirements developed through issue and usage experience, overhaul schedules, stock status, "pipe-line" and reserve" considerations, etc. Both categories are included in logistic planning, the first almost wholly in the top-level departmental planning, the second largely in the operating forces and technical Bureaus. I will devote myself in greater measure to the first category.

In my opinion, logistic planning is closely analogous to budgeting in that it entails systematic analysis of what is required in relation to what can be had, and eventually a balancing of the desired against the possible. Most people have learned by experience that budgeting becomes increasingly difficult as the sum total of what is desired is reduced to real "musts" and still exceeds or closely approximates the aggregate of what can be had. It is no different in logistic planning. Thus logistic planning--which includes development of requirements--is not of controlling importance when supply is large in comparison with demand; but it becomes vital when we are endeavoring to apply our maximum effort, for the magnitude of this effort will depend significantly on the efficiency with which we utilize our potential maximum capacity.

Our biggest logistic plan is the logistic plan which is designed to support our mobilization for war. Everyone knows that war in this day and age, for a country like the United States, means all-out war--hence our mobilization must be for an all-out effort, and the mobilization logistic plan must be one adequate to support that effort. In this Industrial College you are principally concerned with ways and means of developing such support from industry to the utmost; I feel that it would therefore be appropriate for me to make the major point, in this talk on "Navy Requirements," a description of the process by which the Navy determines its total requirements to support mobilization.

Not long after the cessation of hostilities in World War II, the Navy Department undertook the preparation of a mobilization plan which was designed to serve at least as a stop-gap pending the preparation of a comprehensive mobilization plan based on reasonably realistic assumptions as to future strategic plans. This stop-gap plan was very simple; it assumed no specific war tasks, but merely indicated the time-phasing for bringing active and reserve fleet units to war readiness and for reactivating and bringing to war readiness the inactivated or "mothball" units. In the absence of specific war tasks, it was decided that consumption rates comparable to those actually experienced during fiscal 1945 should be assumed. The time for bringing active units to full war-readiness was set at one month, for reserve units at three months, and for inactivated units at nine months; appropriate stipulations were included for bringing to war-readiness bases in the various categories of activation.

This constituted a statement of requirements, and based thereon the Navy Department undertook the preparation of what was entitled Logistic Support Plan No. 1. The statement of requirements was promulgated in December 1945, and the completion date of a first approximation of Logistic Support Plan No. 1 was set at 1 July 1946. By September the contributory plans of the various bureaus and offices of the Navy Department, numbering 23 in all, had been submitted and an analysis and feasibility evaluation was undertaken by the Logistic Plans Division. By 15 October the latter had been completed, points of unfeasibility indicated, and in some cases remedial measures revealed. Although admittedly a plan of limited application, the strategic mobilization plan and its associated Logistic Support Plan No. 1 served not only as a very valuable trial run for our logistic planners, but it produced concrete results in revealing, before demobilization had gone too far, the fallacy of declaring surplus numerous installations and items of equipment. It revealed, for example, that the existing plans for disposition surplus certain training stations and recruiting activities would render it physically impossible to reopen even our existing shore (including the inactivated ones) within nine months. Similar indications were arrived at with respect to all manner of items of equipment--even clothing--and this information was most useful in overcoming pressure from the surplus property administration to literally open the gates and let flow out--at a few cents on the dollar--any critical items of war reserve. The Logistic Support Plan No. 1 gave us the first concrete data, to scale, of what our aircraft production task would be like in the event of mobilization, and served as early warning against using too free a hand in releasing wartime production facilities in this field.

I have mentioned the foregoing more or less in passing, for I desire to exemplify in the form of an accomplished fact some of the most important features of broad gauge logistic planning, including the most important feature of all, viz, the determination of requirements. In broad outline the steps in the development of Logistic Support Plan No. 1 were: (1) The statement of requirements based on strategic considerations--in this case merely the placing on full war-footing of all existing naval craft, and their support at consumption rates actually experienced in June 1945; (2) the determination of what would be needed in men and material to fulfill these requirements; (3) a comparison of what was thus needed with what could be had; (4) the institution of measures to permit the fulfillment of needs which could not be fulfilled under existing conditions, in so far as this was within the limits of reasonable feasibility; and (5) the adjustment of the strategic plan to bring it within the limits of reasonable feasibility. The same steps should be followed in the development of any logistic plan--and I repeat at this point that a strategic plan and its supporting logistic plan are no independent toys and cannot exist without, one might say, the knowledge and consent of the other. The statement of requirements is made by the strategic planners; it is based

by the logistic planner; and it is the logistic planner who has the responsibility of determining whether the statement of requirements is one that can be fulfilled. In this he can be like the "no-can-do" paymaster, who devotes his energies to finding out why things cannot be done; but he should be like the "can-do" paymaster, who devotes his energies to finding out how things can be done,--and if no way as yet exists, he devises one if at all possible.

One other point of interest is included by the experience with Logistic Support Plan No. 1 which I have briefly outlined, namely, the time element in developing this sort of plan. It took approximately eight months to produce a first approximation of this plan in sufficient detail to permit a feasibility assessment. It was reported in some cases that at least another ten months would be required to develop the plan in sufficient detail to insure effective implementation--provided that existing planning agencies were not reduced in strength--and this was a relatively simple plan, one, for example, including no new shipbuilding program. Of course, the then existing planning agencies have been reduced in strength, and the chances are that they will suffer still further reductions; that is why I found it fitting to note earlier in this talk that the maintenance of strong, competent logistic planning agencies is a must of the first order. The task to be done is enormous, both in magnitude and in importance!

In the latter part of 1945, the Joint Logistics Committee of the Joint Chiefs of Staff undertook, as called for by the terms of their charter, the preparation of a so-called "Over-all Logistic Plan." Although I was for two years a member of the Joint Logistics Committee, I never was satisfied that I (or anyone else) had a clear understanding of just what this "Over-all Logistic Plan" was really to cover. The job was on our agenda for many months without getting substantially past the discussion stage, but it did engender the thought that what was ultimately needed was a logistic plan to support mobilization, and in the summer of 1946 this project was undertaken.

There was, at first, considerable difference of opinion as to the best manner of approach to this problem. One school of thought reasoned that since any future war in which we were likely to engage would be an all-out war, we should first determine the magnitude of our all-out effort, and, based on that knowledge, determine what kind of war we should plan to wage. It was reasoned that a start could be taken on our maximum potentials in aircraft production, shipbuilding, ordnance procurement, tank and vehicle production, etc., and with this knowledge plans could be made to utilize the aggregate maximum. This reasoning seemed logical enough to persuade some members of the Joint Logistics Committee to institute such a study--and this study was still on the agenda of the committee when I was detached last July.

In my opinion, however, such a study, while interesting and possibly useful, should not serve as the basis for development of a mobilization plan for all-out war. It would seem to be definitely a case of putting the cart before the horse. There is inherent in such a process the fallacy that the ultimate potential in one field of production, say aircraft, is importantly affected by the priority that field is to be given in relation to some other field of production, say vehicles, or ship-building. To use the hedgehog absurdum, one could build far more aircraft if one decided in advance not to build any ships, or landing craft, or what not; one could build one decidedly greater Navy if one decided in advance to have no army, or air force. Ultimately, then, our over-all potential should be determined on the basis of the proportions in various lines of effort in which it is to be expended. This leads us right back to strategic considerations and to the strategic plan, as the basis for our logistic planning. And it is not likely that, in the first approximations, the sum of efforts in various fields, properly proportioned to support a strategically sound war plan, will not exceed the over-all potential--but I would like to come back to this point later.

During 1946 the Navy Department, in collaboration with the Joint Chiefs of Staff through its representation in the Joint Strategic Planners, developed a strategic concept as a basis for a mobilization plan and early in 1947 undertook the development of a logistic plan in support thereof; this logistic plan was entitled the Navy Basic Logistic Plan (Mobilization). Later, under auspices of the Joint Chiefs of Staff, the Joint Logistics Committee undertook the development of a Joint Mobilization Plan based on the strategic concept and outline war plan agreed to by the Joint Staff Planners. Thus the mobilization planning already undertaken by the Navy Department became a part of the joint mobilization planning of the Joint Chiefs of Staff. I mention this so that it may be clear that the basic requirements determination process which I will now outline is one which has the sanction of high authority; it is not a Navy method, but one which applies the mobilization planning of all armed services--and mobilization is the largest of all our requirements determination problems.

I must, necessarily, use a fictitious example for my explanation of this process here--a hypothetical plan for a war which would tax our full effort. The first step is, of course, the development of the strategic concept, which, naturally, would be based on our present knowledge of the international situation and best forecast as to what the future may bring. This in itself is a problem which no one service can work out for or by itself. It must be done jointly, and it is so done by the appropriate agencies of the Joint Chiefs of Staff.

Let us suppose that our strategic concept has led to the conclusion that a major war, if one should come, would involve, as principal

contenders, ourselves and the great nation of Antarctica--for each controls resources on such a scale as to affect the other vitally. Reasons exist, our respective ideologies are mutually repugnant. It is enough to constitute the major cause for war that can be foreseen. And it dictates that we must maintain specific measures for conducting war against Antarctica. We must evaluate her capabilities to conduct war against us, and forecast the manner in which she will enter into and conduct such a war. We must consider carefully who are likely to be our allies, and the allies of Antarctica--who will be strictly neutral, who benevolently neutral to one side or the other, what routes are likely to be denied to us as the result of hostile control or control by neutrals malevolent to Antarctica. We must weigh carefully the need for defending objectives under our control which are likely to be of prime importance to the enemy, against the need for seizing quickly objectives under enemy control which will be vital to us, and of denying the enemy seizure of objectives under neutral control which are vital to us.

The process I have thus briefly described will lead to the development of an outline war plan--still largely strategic in character, but indicating more definitely the nature and scale of operations which will be required to carry the war to the enemy and keep him from bringing it to us. Such a plan would indicate in very broad terms a phasing of our effort against the enemy--in such broad terms, for example, as that from M to M + X months our main objectives would be to secure and protect certain lines of communication, and to activate, build up, or seize certain overseas bases, embarking on air and amphibious operations on a relatively minor scale; from M + X to M + Y months our main objectives would be to contain the enemy's supply lines, and to subject his homeland to bombing raids in order to reduce his industrial capacity to a point insufficient to support his operations on a scale which would allow invasion by our forces too costly; from M + Y to M + Z months our main objective would be to undertake and consummate large-scale amphibious operations culminating in invasion of the enemy's homeland and in enemy his surrender.

Our strategic concept has thus served as the basis to determine what our tasks are going to be, and, roughly, the time-phasing in which they will be imposed on us. Knowing what our tasks are going to be, we can undertake the determination of requirements to perform them. To secure and protect certain lines of communication will require, among other things, definite numbers of anti-submarine warfare craft of various types, both surface and air. We have had ample experience in World War I and World War II to guide us in scaling up this task. It spells out into reasonably definite numbers of hunter-killer groups, as we called them in World War II, and this spells out further into definite numbers of CVE's and DE's, and into carpet bombing aircraft to escort them, and into bombs, ammunition, and all manner of other items to supply them. We learned something about submarine warfare in World War II

also. We gathered much experience as to what coverage could be effected by a submarine, consequently how many submarines are required to cover a given sea area; also how many torpedoes are likely to be expended per patrol--which leads to a monthly replenishment rate for submarine-type torpedoes. Experience in other theaters has taught us that the tasks I have just mentioned will most likely be among the first to confront us, hence the requirements to support them must command a high--perhaps the highest--priority. That should be reflected in plans for reactivation of vessels of the reserve fleets (the so-called mothball fleets); it should be reflected in the degree of maintenance given to certain vessels of the reserve fleets, in order that there may be a way for most expeditious reactivation. This again is largely a matter of common sense--much of logistics is merely common sense.

Let us look now, for a moment, into another task--that of keeping certain overseas areas. World War II gave us ample experience as to what such a task might entail under various circumstances. In particular plan under which we are analyzing our requirements permits us to estimate how many carrier task groups will probably be required. That translates readily into numbers of carriers, cruisers, and destroyers which it will be necessary to maintain in the operating area--on the firing line, so to speak. Based upon experience, we can determine how many more this will require to allow for losses, turn-out for repair, etc. The same applies to the planes making up the complements of the carriers; also, good estimates can be made of the bombs and other ammunition, and fuel, which such task groups will require. As our operations proceed to the stage of entering more contiguous bases, and increased scale and tempo of carrier task force support will be required, more task groups will be required, and they will suffer greater losses, and require greater replenishment of ammunition. Then there will be the requirement for landing craft and all that goes with that, including their tactical close air support--which comes still from airplanes, bombs, and ammunition. Concurrently with these operations, and perhaps more or less directly associated with them, will be strategic bombing operations, increasing in intensity and tempo as the radius of operation is reduced by development of bases nearer the target. Also concurrently and also increasing in volume will be our shipping operations--mounting in volume as soon as time goes on there will be more ships to carry across the sea--first marines and base-construction material, then support for these and replenishment for our fleet task forces, and eventually ground forces. The more that is taken over, the more needs be taken over to support what is already there.

I believe you will appreciate that what I have described here rather sketchily is a very complex process and one of vast scope, yet an entirely rational one. Its broad, in general at least, seems obvious. Art is not serious, however, all the experience

factors which are required to carry it out--the multipliers, divisors, and other factors which tell you how many airplanes in all are required to keep one on the firing line; how many tons per month of shipping are required to support one man overseas; and many other such factors. In what I have told you, I have endeavored to show how time-phasing enters into the planning, i.e., the determination of requirements. The end result is a methodical presentation of requirements commencing with M-day and building up month-by-months thereafter. At the top level, the requirements will be defined, as of M-day and month-by-month thereafter, in terms of major end-items--ships, planes, base construction components, CB's to construct the bases, men to man the ships, etc. The requirements for ships, for example, will show, month-by-month, how many are required of each type, from carriers, battleships, and cruisers, to landing craft and patrol craft, and will indicate the expected attrition and other contingent requirements. Comparison with inventory then yields a shipbuilding program. At Bureau levels will be generated requirements to arm these ships with weapons of all kinds, to support them with ammunition, fuel, food, and all manner of equipment and spares. All of these schedules will reflect the phasing both of the ship building program and of the operational employment dictated by the war plan, and the usage rates indicated by the latter.

Requirements for major end-items--ships, planes, base construction components, etc., determined in the fashion I have outlined--are passed in the Navy Department to the Material Division, which, you will recall I noted earlier in my talk, is responsible for the "procurement phase" of our logistics. The Material Division further passes these requirements to the Bureaus--Bureau of Ships, Bureau of Ordnance, Bureau of Aeronautics, etc.--together with instructions as to the sort of analysis which is required to determine the critical factors, or bottlenecks, upon which the feasibility of the entire plan probably will depend. This analysis will yield information as to basic materials, e.g., aluminum, copper, steel, which we know are likely to pace out entire program; likewise, certain critical components, such as reamers, motors, electronic components, etc. I am sure you will hear much more about this part of the problem from others who will address you. It will serve my purpose merely to note that the information thus generated under the instructions of the Material Division--based on requirements as determined by the CNO, based in turn on the joint offline war plan formulated to support the joint strategic concept of global war--is processed by the Navy Department's Material Division to the Munitions Board, where it will be added to similar information fed in on the Army and Air Force, and, together with similar information developed as to requirements for support of the civilian economy, it will become the basis for the development of a National Industrial Mobilization Plan. I know you will hear much about this during your course here. I will leave it with the hope that I have made it clear that the entire process, from strategic concept to an industrial

mobilization plan, is an interlocked, coordinated chain of events, in which all three Services are working from a common basis furnished them by the Joint Chiefs of Staff, and feeding information to a joint body, the Munitions Board, which will plan for the industrial support of the plan and will tell us whether the plan is feasible from the standpoint of industrial support, and, if not, wherein it is not.

I should make one more point. If the Munitions Board finds that our plan would require, say, more steel than possibly could be produced, or greater shipbuilding activity than could be created, then it becomes necessary to go through the chain--as far back as necessary--to determine what should be eliminated, or where the time-phasing should be relaxed, in order to remain within feasibility limits. Some scaling down may be accomplished within the Departments, by using substitute materials, reducing spare factors, or by other technical methods. In the absence of the required measures of relief from such sources, it will become necessary for the Joint Chiefs of Staff to reduce tasks in the critical area, more likely to lengthen the time-phasing for their accomplishment: for example, it might be desirable to create our amphibious lift at full scale for an assault landing of X divisions by X + Y months, but we may have to be satisfied with counting on lift for X divisions at X + Z months, or even a smaller number of divisions at a later time than first planned. You will appreciate, I am sure, that this is bound to be a process of successive approximations, upon which will be imposed from time to time revisions in basic factors, i.e., in the outline war plan. The process must be flexible, and, as we handle it in the Department of the Navy, it is. We believe strongly in what we call concurrent planning, so that planning at each level is initiated as soon as information at the next higher level becomes sufficiently firm to warrant it--rather than that all planning at lower levels must await final completion and formal approval of the topmost plan.

One other point I should make is that aid to our probable allies--lend-lease as we called it in World War II--is definitely being considered and scaled up in our determinations of requirements; it will be introduced through the same process I have outlined, but separately identified.

The time required to complete in detail a plan such as the one I have just outlined obviously is very great. With required personnel available to the planning agencies, I should estimate that it would take between one and two years to develop the plan in detail down to the point of diminishing returns. I have heard estimates as great as five years. Probably such a plan never will be entirely completed--nor should it ever be regarded as complete, for even in the shortest concept and outline war plan upon which it is based remain unchecked,

attrition of existing inventory due to wear-out and obsolescence, and new equipment programs resulting from research and development and bound to change the requirements picture. Strong, competent planning groups at all levels are required not only to develop such a plan but also to keep it current.

I note in the prospectus for this lecture that some mention is to be made of the limits of accuracy which are considered necessary for planning purposes. I doubt that anyone can give a better answer to this than that the greatest accuracy practicable is desirable. I know of no standards of accuracy in the field of planning. I have had some five years experience in planning at the departmental level and my experience has been that one always tries to hit the right answer as closely as possible without risking underestimation. I think 10 percent is very good and 20 percent is not bad, as a margin of error. In connection with the development of requirements for combatant naval craft for the mobilization plan I mentioned earlier, computations made by two different groups, by processes varying very considerably in detail, yielded results within about 10 percent of each other--giving a measure of confidence that the determinations were reasonably accurate. But it will not be possible to tell until we undertake actual carrying out of the plan how accurate they really were. In some cases, of course, operations take a totally unpredicted turn and requirements in some fields drop out of sight or climb out of sight. Requirements for bombardment ammunition were an example. Following our experiences at Tarawa, requirements for large caliber bombardment ammunition (6", 8", 14", 16") skyrocketed to over ten times what had been called for as late as two years after Pearl Harbor! I believe the Army Ground Forces had a similar experience with large caliber artillery ammunition. Requirements for rockets, characteristically of rockets, went from scratch to the ceiling and out in nothing flat. A good rule for a planner is to be as accurate as possible, but never timid; of course, he shouldn't be reckless either!

Let us now examine briefly that second category of requirements determination which I mentioned earlier, viz, that which deals with demands of the operating forces (and this includes bases) for their maintenance, as developed by themselves and by the technical Bureaus. It embraces such things as requisitions from ships, requirements in the form of stock to meet issue and usage rates determined by experience, requirements to meet repair and alteration schedules, "pipe-line" and "reservoir" considerations, etc. Planning in this phase is carried out largely at the levels of the operating forces and technical bureaus--although it may be noted that levels of supply to be carried in ships and at bases are governed by operational and strategic considerations and hence are subject to criteria established by the Chief of Naval Operations.

Planning in this second category more nearly takes on the characteristics of a science. It leans heavily on recorded experience--known facts--which can be reduced to planning factors, equations, or tables. With this systematically developed information, troop-and-item requirements can be translated into over-all requirements including "pipe-line" and other distribution factors, allowance for spoilage and attrition, for initial stocks and replenishment of consumables, and for such contingencies as may be appropriate. In the important part of the Navy that recorded experience, together with a comprehensive exposition on the techniques for using it, has been compiled into a publication entitled "Logistics Reference Data," prepared and promulgated by the Bureau of Supplies and Accounts under authority of the Chief of Naval Operations. In it will be found information, for example, for the determination of port capacities, road capacities, airfield construction requirements, supply factors in terms of tons per month per man for various consumables, factors for determining such requirements under various operating conditions, area requirements for various types of advanced bases and their several components, storage space and cube requirements for various quantities of various types of materials, and a vast amount of similar information. During World War II the Bureau of Supplies and Accounts developed the AMS-4 load as a device for balanced maintenance shipping to advanced bases and fleet units supported by the bases. It consisted of approximately 7,500 items of general stores, clothing and small stores, and ships stores (or FX) material, in quantities designed to support a population of 40,000 persons for 60 days in the case of the general stores items and 30 days in the cases of the others. One can readily see how greatly such a device can simplify this portion of requirements determination and supply for the individual case. I dare say the thing could be worked out down to the detail of providing those safety pins in the proportion in which experience had indicated buttons would be lost.

This is an interesting phase of logistic planning, but one which should be accorded time in its own right. I note, and invite your attention to the fact, that in addition to the publication "Logistics Reference Data" to which I have already referred, there is an Army lecture entitled "The Determination of Requirements for Combat Operations," prepared by the U.S. Naval School (General Line) and issued by it under the number C-2-2. It covers in somewhat greater detail things I have briefly outlined above.

Before leaving this aspect of the problem, however, I should like to mention that determination of ammunition requirements is another such as a class by itself in that past experience may be of little or no help in it. Early in World War II we had practically nothing to go on to plan ammunition replenishment requirements. Arbitrary allowance and reserve factors became utterly unreasonable when applied to the volume

of gun production that occurred in certain calibers. For the Navy's 20mm, for example, the established allowance was 6,000 per barrel, with a reserve factor of 2.5 (i.e., 2.5 allowances carried ashore)--or 21,000 rounds in all per barrel. When gun production hit 5,000 barrels per month this meant 100,000,000 rounds of ammunition per month for this caliber alone. The result of adding the requirements of all calibers, determined in this fashion, was no less than fantastic. It was a real headache for the planners--no one, of course, wanted to risk being responsible for letting the ammunition locker become empty! The answer was to gather statistics as soon as possible. These came rather slowly, as it was difficult to get people out in the wilds of the South Pacific, where they were literally slugging it out toe to toe with the enemy, to turn in accurate ammunition expenditure reports--or even any. It was necessary to wait until lump-sum replenishment figures gave significant results before reasonably reliable factors could be established. An interesting finding which I recall is that for antiaircraft automatic weapons the expenditure rate for training amounted to about 90 percent of the total expenditure rate; it is logical, but who would have thought it? I recall too, that in the Bureau of Ordnance we made a practice of always applying a substantial multiple to the AP ammunition requirements passed on to us from the Office of the CNO, and yet we never got ahead of the game in that type of ammunition. I recall the figures that, as of June of 1944, monthly production rates to supply the replacement for 6", 8", 14", and 16" HC bombardment ammunition were, respectively, 5, 8, 9, 12, and 3. Times what they had been as of March 1943 (only nine months earlier)--reason, forces had occurred in the meantime, and Kwajalein, Saipan, Guam, Peleliu, Iwo Jima, Okinawa, and Honshu were coming up!

Most of what I have said thus far relates largely to planning for future operations, and I have done this intentionally because I believe that is the phase of requirements determination in which this course is primarily interested. Planning for current operations, however, deserves mention, for the system by which current operations are met in peacetime is the system which will have to do the same job in wartime--in other words, administer the vast plan which now is a future plan but then will become a current plan.

The system obtains the maximum supply response to operational requirements, and obtains the maximum economies consistent with effective operational support, by the establishment and operation of specialized systems of technical supply corresponding to the several categories of naval weapons and technical material. There are presently established in the Navy, or in the process of being established, supply offices for material, spares, and equipment unique, respectively, to aviation, ordnance, ships, electronics, motion pictures, submarines, gyros, clothing, provisions, medical, construction, automotive, and

general stores. Each is operated in accordance with standard inventory control policies and procedures, and is responsive to CNO information and direction as to military operations. The operating echelon of each of these Supply Offices--actually they are individual, although integrated, technical supply systems--is headed and controlled by a specialized Supply-Demand Control Point. These control points are the nerve centers of the systems, to which are transmitted operational and technical intelligence, to insure responsive and economical supply support.

The Supply-Demand Control Points combine supply management and technical information and evolve technical supply action for their respective systems. For example, the Aviation Supply Office receives projected broad aircraft operational plans from the Deputy Chief of Naval Operations for Air, via the Bureau of Aeronautics, and translates these broad plans into factors applicable to determinations of corresponding aviation material requirements. From the fleet and aircraft overhaul establishments, the Aviation Supply Office receives usage data which are analyzed and applied, one which are duly applied to the determination of maintenance requirements. From the field supply activities are received reports, by item, of stock status and past issues. By relating current usage and issue data and technical interchangeability data to CNO's projected programs, the supply Office makes determinations, by items, of gross requirements to support CNO's planned operations. By comparison of these gross requirements with quantities of items on hand and ordered, the Supply Office makes precise determination of how much of each item must be procured to support planned operations, or how much may be disposed of and thus system is relieved of the burden of storing unwanted material. The system is one developed in the light of war experience and one, in my opinion, worthy of your detailed study.

In conclusion, let me repeat what we said in this talk. I stated as first and perhaps most important requirement of all, namely, to have the planning agencies adequately staffed, both as to numbers and as to competence, to do our logistic planning. This should be rather trite, but human nature being what it is, it won't. We have made a fine start in developing an Industrial Mobilization Plan built on factual considerations and supporting a coherent strategic concept and war plan. This did not come about without pain! Logistic planners have to fight for the information and wherewithal necessary to do the job for which they are responsible! And that is the thought I leave with you.

GENERAL McKINLEY: I have a question which comes from curiosity concerning your remark about the two agencies that planned independently. You spoke of their accuracy; that they got to within ten percent of each other. Was one generally higher than the other? Was there a variance, item by item, one way or the other?

ADMIRAL HERRMANN: I do not remember which was high and which was low.

There was a group of naval officers attached to the Joint War Plans Committee and the other was our own operational group (comparable to your J-3). They were working from the same strategic concept and outlined war plan. They came within 10 percent of each other.

GENERAL McKINLEY: I was wondering whether one was generally 10 percent over or under; or whether, item by item, they were within 10 percent. You know what I mean--one up and one down.

ADMIRAL HERRMANN: No. I think one was generally about 10 percent high in practically all categories.

GENERAL McKINLEY: That is what I wanted clarified.

ADMIRAL HERRMANN: I think almost entirely because of more liberal allowance for contingencies.

GENERAL McKINLEY: But there was some basic assumption in it somewhere.

ADMIRAL HERRMANN: Yes.

GENERAL McKINLEY: Any questions?

Admiral, you seem to have stopped them; that is unusual.

We certainly appreciate your coming here all the way from the Pacific. We would have been very much the loser if you had not done it. We thank you, indeed.

ADMIRAL HERRMANN: It was a great pleasure.

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