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CURRENT MOBILIZATION PLANNING FOR PRODUCING AND MAINTAINING SHIPS

11 March 1949

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CURRENT MOBILIZATION PLANNING FOR PRODUCING AND MAINTAINING SHIPS

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ADMIRAL SABIN: Gentlemen: About ten years ago we had a merger within the Navy Department, believe it or not. The Bureau of Construction and Repair was united with what was then the Bureau of Engineering, and out of that union came what is now called the Bureau of Ships. Like many other things that are proved with the passage of time, that move was also proved, because the Bureau of Ships now is probably the largest and certainly one of the most important,--and, I might add, progressive--of all the technical bureaus within the Navy Department.

I don't know where you could go to get more complete and more accurate information on the subject, "Current Mobilization Planning for Producing and Maintaining Ships," than in the Bureau of Ships; and I don't know anybody who would be better qualified to give you that information than our speaker this morning. He has devoted practically his entire naval career to ships in one form or another--design, construction, maintenance, repair--and he has held some very important assignments, both afloat and ashore, among them being Chief of the Design Division, Bureau of Ships, a short-term professorship and head of the Naval Construction Branch of the Massachusetts Institute of Technology, and for the last two and one-half years as Assistant Chief of the Bureau of Ships.

It is a great pleasure for me to introduce to you Rear Admiral Charles D. Wheelock.

ADMIRAL WHEELOCK: Admiral Sabin, gentlemen: I should like to discuss with you this morning some of the things that the Bureau of Ships of the Department of the Navy is accomplishing in planning its contribution to a possible future mobilization.

Before discussing the details of this subject, it is proper to set the stage by showing how the Bureau of Ships and its responsibilities fit in with the broader responsibilities of the Department of the Navy as a whole. It is also necessary to indicate the need for coordination between the demands of the Bureau of Ships upon industry and the parallel demands of the other agencies of the National Military Establishment and of the Maritime Commission.

The Navy's role as the seagoing member of the National Military Establishment includes the time-honored and unchallenged responsibility for keeping the commercial sealanes open; that is, free to merchant vessels of all nations in peace but free only to our own and friendly shipping in time of war. Unfortunately, it appears to be true that a relatively small proportion of our people realize how immediately dependent the security of our accepted standard of living is upon the maintenance of open markets abroad and the continuance of free-ocean commerce.

We just do not have available here among our own resources a great many of the things upon which we depend in quantity for the sustenance of the good life we lead. We must go abroad for manganese, coffee, and tin, to mention but a few. Even many of the natural resources we do have at home, such as the ore from which aluminum is reduced, are of insufficient richness to be profitably used, hence we must send overseas for better ore. Stockpiling of strategic materials, granting its supreme importance as a war asset, is a palliative for the early phases of war, but insufficient for the prosecution of a long war.

At the same time there is nothing yet we know about that can possibly take the place of surface ships for lifting the great quantities of things we must have between the land masses of the earth. The ocean is a self-lubricated, cost-free highway, as is the air, but the ocean has the additional advantage over the air of supporting loads by displacement. This means in turn that the ratio of useful lift to thrust, which is one measure of efficacy of transport, is a hundred times greater than in the case of a plane or submarine. They do not make use of a cleavage plane and displacement for support.

The Navy's job is to keep the sealanes open. There is no gainsaying that the sealanes must be used. Equal to our responsibility for keeping the sealanes open is the responsibility for seeing to it that we have merchant ships among those that use the lanes. This employment has immediate effect upon Navy demands against the country's manpower and facilities which may be planned as a mobilization measure, because merchant ships compete for the same things and manpower as war ships. Actually it is necessary to realize that a Navy without a Merchant Marine or a Merchant Marine with a Navy--either without the other--is of reduced usefulness and purpose. It is essential, therefore, in planning for an emergency that both be given measured consideration.

It is the responsibility of the Chief of the Bureau of Ships to design, construct, maintain and improve ships and craft of the Navy and to perform necessary research in connection therewith. The new Navy Regulations just printed adds "and related matters." The intent of these words is to invite attention to the fact that the Bureau of Ships is responsible for everything material in Navy ships except where specific

exceptions are made in the regulations. The specific exceptions include the ordnance and its control, part of the protection of the ship against missiles of various kinds, and some of the aeronautical gear, such as catapults and arresting devices on ships.

In addition to its responsibility for ships, the Bureau of Ships is charged with equipping and maintaining the Navy's entire shore communication establishment. It has responsibility for the management of the eleven naval shipyards and of five research laboratories, and for the special inspection offices at the plants of commercial shipbuilding yards and at the manufacturing plants of the principal main engine suppliers. "Related matters" bulk large in the responsibilities of the Chief of the Bureau of Ships, for example, as in shipbuilding facilities, pure or scrambled.

In any broad use of the term "Mobilization Planning," it is helpful to realize that the preponderant part of the Bureau's whole peacetime activity is of that character. We are constantly endeavoring to improve the ships that are active in the fleet. Since funds are limited and improvements can generally be made only on a limited number of ships, the aim of this improvement is to establish the value of improvements to things and techniques for ships. After a new device, procedure, or system has been proven, then it can take a firm place in mobilization planning. Every dollar spent in research and development is aimed at improvement in the detail or over-all behavior of ships and in keeping ahead of developments which a potential enemy may use. Every design of a new ship is an attempt to provide the Operating Services not only with a new or improved weapon, but with a whole new ship, better able to keep the sea, to maintain her speed, with improved living conditions, increased resistance to the effects of attack, and with increased material advantage over any that has gone before of our own or of an opponent. When better ships are built, the Bureau of Ships will build them.

The developments between the wars of the family of submarine types which finally resulted in the submarines which sank the preponderance of the Japanese merchant fleet is an illustration of what I mean. The patient, month-by-month improvement of design and equipment, the development of the submarine Diesel, the introduction of air conditioning, all were directed toward improved reliability and power and endurance. These developments are "Mobilization Planning" in the best sense, and they affect industrial mobilization planning in an immediate sense.

The CVA-58, the USS UNITED STATES, will be the latest model in a series of aircraft carriers dating back to the LANGLEY. Every feature in the new ship has a history of experience, of thought, and of argument, that is common in ship design. A thorough and accurate specification for all of her thousands of components will constitute a vital part of any mobilization program for new construction in which duplication of her as a prototype may be included.

Some interesting things turn up when one considers the requirements of production in ship construction. Ordinarily in peacetime we build ships; we do not produce or manufacture them--in the production line sense. I remember in the early stages of the Landing Ship, Medium (LSM) that we worked along in our usual manner, thinking in terms of a prototype or two as the construction target. The idea of the ship stemmed from our Design group and we tried to keep it quiet while we worked out details. One day the operators got wind of our efforts, and the next thing I knew, we were under pressure for speed and there was a requirement for 350 of them. The sense of responsibility one develops for creating a design of an untried ship for unique uses when it is backed by an order for a large number is a burden.

We are living in a period of emphasis on research and, particularly, development unparalleled before. One effect of accelerated design, development, research, and improvement upon the problems of industrial mobilization is to make us face squarely the problems incident to standardization on one hand, and nonstandardization, or flexibility, on the other. Mobilization planning can be beautifully handled if we decide on everything in advance; that is, make things standard and agree to make no changes. Our present progress in shipbuilding materials is so rapid, however, that we must tailor our mobilization planning to the principle that a very large proportion of our ship and component designs will be improved and changed from year to year.

The Bureau's device for insuring that good judgment will be brought to bear on the necessary compromise decisions has been well worked out by Captain Vangeli who is with us this morning. He reasons that our Bureau technical sections--those units of organization having to do with turbines, boilers, gears, pumps, furniture, radios, radars, ship hulls, and so forth--are the best repositories of information on the details of material and design on combatant ships which exist. At the same time, the men, mostly civilian, who staff these sections are the best interpreters of that information; and finally, if we are to mobilize--that is, use the mobilization planning--the responsibility for the actions stemming from the plan will fall upon the individuals who are in these technical sections.

Instead of creating a large, independent mobilization planning group, which would be more or less insulated from day to day operations and developments, he has used the experience and abilities of the engineers and architects in the Bureau's technical sections in our Mobilization Plan. His office only interprets and coordinates and guides the work of the sections in this direction. It does the work concurrently with its day-to-day obligations. Incidentally, he has performed a remarkable task of stimulating his assistants' enthusiasm and getting the work done along with daily tasks, without fuss or grievance or hard feelings. The Bureau's Mobilization Plan, insofar

as it is now ready, is thoughtfully and well prepared by experts, each of whom is fully conscious that he will have the responsibility for putting his part of it to work, should the occasion arise.

Like all other Bureaus and Offices of the Department of the Navy, the Bureau of Ships uses as its basis for approach to its own Mobilization Plan, the Basic Mobilization Plan prepared by the Chief of Naval Operations, and the Industrial Mobilization Plan furnished by the Munitions Board.

The Bureau of Ships' principal programs in Mobilization Planning include: fleet maintenance, reactivation, arming of merchant vessels, and new construction. This list is not to be considered as one indicating priority, since most of the listed items must be pursued concurrently upon mobilization.

Fleet Maintenance.--Fleet maintenance requires us to plan for the procurement and assembly at assigned shipyards, not only the parts and components that require replacement due to war during accelerated operations of war, but also the vast store of new and improved components which must be installed on the ships as soon as they can be procured. A specification description of many of these new components is difficult to keep up to date because they are constantly changed through development and evaluation in ships. This is a continuous process during peacetime. We know that we can, with profit, provide new and higher performance electronic gear. It is impossible to get appropriations of sufficient magnitude during peace to do much more than evaluate new components. It is therefore incumbent upon us to include these improvements in our planning for mobilization.

Reactivation.--We have a fleet of some two thousand excellent vessels in reserve status. These ships are being maintained in an excellent state of preservation through the use of techniques of dehumidification which has been developed specifically for them. Never before have we been able to accomplish interior preservation as thorough and complete as we have in these ships. Deterioration of their interiors has been completely arrested. The exteriors of the hulls themselves are in good condition. Weather exposed gear of various sorts, such as radar wave guides and antennas, lockers, etc., will need extensive replacement. But with few exceptions, the ships will be able to take their places in the fleet very soon after mobilization. It therefore becomes an early problem of mobilization to do much necessary work which will be required when these ships arrive for their first overhaul after mobilization.

Arming of Merchant Vessels.--Requires many decisions and much pertinent planning.

New Construction.--It would appear that the biggest task facing the Bureau would be in connection with the preparation for the construction of new combatant vessels. In the sense that in numbers of items and in volume of procurement this is true. During the last war the Bureau's bill for new ships amounted to about 23 billion dollars. The first Basic Mobilization Plan indicates a third world war cost for new ships of three to four times that much.

The primary target of mobilization planning is to save time. Mr. Churchill in his volume "The Gathering Storm" said that munitions production on a nationwide scale is a four-year task: the first year, there is nothing; the second year, a trickle; the third, a lot; and the fourth, a flood. The production of ships is no exception to this rule. Our trickle of new ships has in the past started near the end of the second year. What we can do by careful mobilization planning to reduce this large factor of lead time is variously estimated. It is perfectly clear, however, that one of the things that history and our present studies of mobilization planning clearly show is this: We must depend for our forces afloat upon what we have on hand for the period between one and one-half and two years after the commencement of our war effort. This in turn makes clear the vital importance of keeping our active and reserve fleet ships. Their usually accepted service life, depending upon size, is from fifteen to twenty years. But for emergency purposes (and that is why they are being kept) they will undoubtedly be good as long as the hulls are sound and the machinery in order. Obsolescence of the basic hull and machinery does not stand in the way of effective use of these ships in time of emergency.

We should never let ourselves forget that when German submarines were sinking our merchant ships along the Atlantic Coast and in the Gulf of Mexico in 1942, we sent out droves of pleasure and fishing craft to make impotent gestures toward stopping the German raiders. It costs little to keep our reserve ships in excellent condition. Let us never forget how important they would have been to us had we had them in 1942.

Other targets for the Bureau's mobilization planning are the revival of the remarkable ship salvage service which was created under the leadership of Rear Admiral Bill Sullivan, and which served throughout the world during the war. We must prepare for equipping advance repair bases and for ship repair units of trained men to serve them. New shipbuilding and ship repair facilities and the expansion of existing ship repair facilities will be required to serve our present active and reserve fleets and the fleets of merchant vessels which carry the cargoes. In this connection we must recognize the fact that our World War II fleet was a fleet of new ships and that we never did attain the pace as regards repair and battle damage which would have been necessary in another year of war. Our repair yards were all busy, yet we had a

great many new ships which operated until the end of the war without receiving major overhauls. Another time we will not start out with a new fleet, and we must plan our repair facilities to match the obligations for ship maintenance at a higher rate and volume than we have ever experienced before.

The Bureau of Ships' mobilization planning must reflect an expansion and an improvement of electronic and other equipment in the whole shore naval communication service. This involves the scheduling of a vast amount of procurement to allow us to attain quickly the increased capacity for communications always required in a war emergency.

I want to point out that in most of these targets, in fact all of the ones having to do with ships, the efforts of the Bureau are complicated by two principal factors. First is the special requirement for all of the things that go into a ship. These basically stem from the fact that sea water and salt air are highly corrosive agents, that the ship is continually, while at sea, in more or less active motion, that many of the locations aboard the ship where instruments and components are mounted are subject to some constant ship vibration, and they are always liable to be subject to mechanical shock from the ship's own gunfire and the explosion of torpedoes or bullets or bombs. Our specifications reflect the effects of these factors and must meet the requirements for minimum weight. They result in specialized and expensive equipment for which procurement lead time becomes an important factor.

The other element with which we are faced in our procurement problems is the extreme diversity of the parts and components that go into making up a ship. Our coverage is one with the whole of the United States industrial matrix. In all of it, our requirements are special. Hull steels are often special as regards high strength or ballistic properties. Our requirements for main propulsion machinery include flexibility in the use of operating power as well as long, continued operation at reduced power. This flexibility and the great importance of minimum of weight results in requirements for ship power plants very different from those normally accepted for merchant shipping. We must provide all of the gear that goes with modern living: laundries, pressing establishments, hospital equipment; efficient, high-capacity food preparation equipment and spaces--efficient because little space is available to accommodate them. Even the wash basin that we specify is special because the standard article is unduly heavy.

Our requirements for piping used for salt water systems are narrowly defined and extremely expensive, because if we allow for corrosion by increasing thickness, we add too much weight to the ships. We must, therefore, use special alloys. Our ships have so many electronic installations that our bill for replacement parts and tubes approaches the bill for parts for all of the rest of the ship put together.

Mobilization planning, therefore, inevitably results in many thousands of studies of the tens of thousands of parts and components which go to make up ships.

Finally, in the Bureau all of these studies and all of these targets are resolved into requirements on a time basis of (1) manpower, (2) facilities, and (3) materials. When the work on any given mobilization plan has progressed to the point where these elements can be summed up, we are then in a position to relate the requirements of the plan to the availability of manpower and materials. We are also to the position which the Bureau of Ships' part of the Navy mobilization plays in its relation to the other elements in the National Military Establishment.

I shall now show charts illustrative of the results of the current detailed mobilization planning in the Bureau of Ships. (Charts were not reproduced.)

QUESTION: If I have read the chart showing some of the impulse turbines correctly, our requirements between M-30 and M-36 are going to be about 60 percent in excess of what our production of turbines was at maximum capacity in World War II. That suggests to me the question as to whether mobilization planning as now conducted in the Bureau of Ships contemplates substituting propulsion gears for turbines or whether it plans to increase the production of turbines and gears; if so, how does it plan to bring that about? By that I mean, are we going to increase the capacity of, first, the key producers in World War II; and, secondly, do you think it will be necessary to establish additional facilities?

ADMIRAL WHEELOCK: What we propose is to pursue all of those approaches. In addition, as I indicated, we are working on an experimental destroyer to get higher powers. We will load gears higher, thereby getting smaller gears for a given power. We have projects out to increase the number of tooth contact surfaces in any particular assembly of gears so as to reduce the gear width. That will give us an enormous advantage because if we can get the sizes down, we can form the gears in smaller machine tools. The use of smaller machine tools will increase capacity. By all these devices we expect to be able to increase output from existing plants. There is a belief that we can use many more factories in the production of turbines and gears. Developments proceed all the time. The pressure is on us to make simplifications that will permit us to step up industrial capacity.

You mention the question of using other kinds of power plants. In the ships and craft that we had during World War II, more than half of the total installed power was in Diesel engines. Diesel engines, unfortunately, eat parts about the same as they do oil and fuel. We can't

afford to go to the old up-and-down steam engines, and we are even urging the Maritime Commission not to make use of the old-fashioned engines in their prototype vessels for future war production of their merchant ships, for the simple reason that they burn oil too fast. We have to be efficient in order to save our resources. The solution is in all those areas you mention, plus a lot of research and development and improvement in our techniques, particularly toward making possible the use of smaller machine tools and fewer special type machine tools.

QUESTION: Would you develop a little more what the tie-in is between the Navy and the Maritime Commission in mobilization planning?

ADMIRAL WHEELOCK: I wish I could. The need for the tie-in is amply evident. I had the picture very clearly brought home to me about two years ago when I was made chairman of a joint committee named by the Munitions Board to arrive at a joint study of procurement possibilities for ships and ship machinery. It became immediately evident that the committee had no jurisdiction in the areas of several of its component parts. The Maritime Commission was the most important one outside of the National Military Establishment. The Coast Guard could be sort of swept in on the basis that it would become a part of the Navy. But we were stymied by the fact that the Maritime Commission couldn't officially agree.

An effort is being made and some steps are being taken to set up a Joint Planning Agency under the National Security Resources Board. That is a matter very difficult to handle, but at the same time it is extremely important. What will come out of it as a wartime measure, no one knows. What we believe is necessary is a sort of czarist system that will provide common direction in the area of ship repair on the one hand and shipbuilding on the other, and possibly even ship operation. But the picture is not clear at all and needs a great deal of important high-level decision and work. Probably it will require modification of the statute, even for wartime application.

QUESTION: In connection with the reactivation of the reserve fleet, you say you have orders and lists prepared for new developments to go into that fleet. Do you expect to put much of that into the fleet before it puts to sea for the first time, and, then, can you tell us how much time it will take to put those ships into action?

ADMIRAL WHEELOCK: It is not a question of how long it takes to put ships into action. It is a question of how good they are when put in and whether you are willing to send them into action without all these components and materials. I think by and large the ships are going to be in shape or are in shape now so that they can put to sea very soon, but they are going to be deficient in comparison with the active fleet ships in certain things.

It all depends on whether we get scared soon enough. It makes a great difference. In World War II we were scared soon enough so we had a long running start on this whole business of fleet ships, and for preparing ourselves for the effort. I remember when I was in Design in the Bureau of Ships, we started overtime work in 1938 and worked straight through from then on. If we get some warning, it is one kind of problem; if we don't, it is another. If we don't get the appropriations to buy improved gear for the active ships and the reserve ships until the jump-off gun, it is going to take a long time to make improvements. Lead time on a great deal of the ship electronic equipment--and the same is true for airplanes as it is for ships--is twelve to eighteen months. You just can't with it into being. The best thing we can hope for is to get scared soon enough. Does that answer your question?

QUESTIONER: The other thing is the time element after M-day. I think that will be the same whether the improvements go in or not.

ADMIRAL WHEELOCK: That is right, and that time element is set up as thirty days for the first blush of ships. I rather expect that we will be able to get the ships out about as fast as the crews can get to them and do a little work. After all, these crews--even though they derive from the people who operated the ships during the last war--have to have a refresher training period. You can't shoot a gun, ring a bell, and steam out to sea. Crews must exercise a while before they are worth anything. A great deal must be done in the ships themselves before they are ready to serve. They have to be loaded up with provisions and fuel. The longer the ships are in reserve, the more of them will have to be put in dry dock to have their bottoms cleaned and painted.

Many ships can be put to sea in a short time. The thing that bothers us is the operating effectiveness of the ships. If we consider certain radar to be essential and antennas for the radar have deteriorated they have to be bought. We don't get enough money to buy them for the reserve fleet ships. It is difficult to keep certain types of antennas in order on the regular ships.

QUESTION: Would you enumerate for us the advantages of the combination in the Navy Bureau of Ships, and what disadvantages there would be if they were separated, say, Maintenance and Engineering and Design were separate organizations rather than all combined as they are in the Bureau of Ships?

ADMIRAL WHEELOCK: Well, that is a good question. There were a great many of us who had grown up in one bureau or the other. Like this unification business, we had a great many misgivings as to how the amalgamation would work. Personal perquisites were not the least thing involved. The result has been all good. I don't think there is anybody who finds any part of it objectionable now.

We of course had problems between the two bureaus different from the unification problems. The Bureau of Engineering built and installed engines, lighted the spaces, built the pumps, and so forth. The Bureau of Construction and Repair built the hulls and outside equipment; provided steering engines, anchors, windlasses, cordage, soda fountains; and equipped the hospitals. There was an immense amount of parallel effort. There tended to be a bit of squabbling over the compromises that had to be reached. A ship is all compromises. You can't get all you want in any area. You have to barter and trade. When all the units of organization were brought under one organization, in the amalgamation of the two Bureaus, it was helpful immediately.

We found by trial and error that putting the maintenance, shipbuilding and the conversion functions together also had an advantage. We started by having in the Bureau of Ships a Maintenance Administration, a Shipbuilding Administration, and a Business Administration. Under this organization we failed to reap the benefits of experience with ship maintenance in our design and construction of ships. When we combined these functions, battleships, for example, were under one head from the time they were placed under construction until they were scrapped; this had a lot of advantages. All the experience that was gained by handling battleship desk maintenance could be turned right into design and construction. It is an area where merger was very, very profitable. Strange as it may seem, the most difficult part to amalgamate is in the area of design. The marine engineers had been going their own way for years and years. The naval architects had been doing their business for a long time, and you just have to let some of those fellows die off before you can get the work coordinated.

QUESTION: We are interested in surveys of industrial capacity. I notice you said the Bureau of Ships had requested 11,000 industrial facilities. Could you tell us what progress you have made in estimating the capacity of those facilities to turn out the required work?

ADMIRAL WHEELOCK: I am going to ask Captain Hamilton to say a word on that. He is the officer in the Bureau of Ships who not very long ago initiated and put together a section which handles our allocations. It is a prodigious task, and I would like him to say a word on that, if he will, please.

CAPTAIN HAMILTON: What I can say is not too helpful. The 11,000 figure that Admiral Wheelock used was the estimate of the number of plants we would require. At the present time we have actually requested allocation of about 25 percent of that number and have surveys on about one-fifth of the 25 percent, or 5 percent of the total. I believe that it is probably reasonable to say that an appreciable number of these surveys have been analyzed by the technical desks in the Bureau and that task falls back on the other things that Admiral Wheelock mentioned. Actually we are just about to start in that field.

QUESTION: In trying to find out what constitutes the military industrial plant reserve, we discovered that there was some difference of opinion concerning the permanent military establishment plants, particularly that the Navy Department felt that a number of its permanently established plants should not be listed as either active or inactive military plant reserves. Could you tell us what is behind the Navy's position in that respect?

ADMIRAL WHEELOCK: I don't think I can. That may be in other parts of the work of the Department of the Navy. I have heard no discussion of that with respect to the plants that the Bureau of Ships controls. Actually the plants that we have are not invaded much by other activities. We don't get into very many arguments about them. The shipyards in particular are fairly pure. Of course, Ordnance and Aeronautics have a lot of plants, too, and it may be that it is in that area. I am sorry, but I don't have the answer to your question.

QUESTION: On the question of standardization, particularly of technical components, what progress is being made between the Bureau of Ships and the rest of the Military Establishment? I think you have already pretty well answered the question between the Bureau of Ships and the Maritime Commission. Could you say a little more on that?

ADMIRAL WHEELOCK: Yes, standardization is going forward in areas. Standardization in electronics, for example, is going forward up at Fort Monmouth in connection with the standardization of the component parts of all electronic equipment. As you know, that is where the Bureau of Ships representing the Navy joins with the Army and the Air Force.

The Bureau of Ships representing the Navy furnishes parts for Diesel engines wherever they exist in the National Military Establishment on a retail store basis. We in the Standard Specification Committee are working across the board.

When I said that standardization is difficult, I didn't want to imply that none of it is going ahead, because a great deal is, in the things that are usually considered standard, in industrial work--bolts, nuts, and standards of measurement. What I wanted to imply was that the special requirements, arising from conditions under which our ships operate, make it very difficult to arrive at standard components. Let me see if I can get an example. Wash basins that we use in thousands aboard ships are not at all the wash basins that you get for any other application. We have to be particular about weight. We have to be very careful about corrosion. So the wash basins that we buy are not standard in industry and they won't be standard with any other part of the National Military Establishment. The same thing is true of so much of what we do. There is a clause in some of the directives that marine applications are usually peculiar to the Bureau of Ships. But there is a lot going forward in general standards.

QUESTION: I believe you said it takes approximately thirty days to get a reserve ship activated. I think you also mentioned that ships' bottoms were looked after 100 percent in these moth-ball ships. Does that mean you wouldn't have to dry-dock ships before putting them into service?

ADMIRAL WHEELOCK: There are two elements in protecting ships' bottoms. One is to prevent corrosion and the other is to prevent fowling. The paints we have now insure against corrosion to a remarkable degree. Depending on the anchorage, the berthing place, fowling will take place. Some places are much better than others. We have no paint yet that will protect ships' bottoms from fowling over a considerable period of time if the organisms are active. In a great many places dry-docking will have to take place. In all this consideration of how many days it takes to get a ship into service when a ship is in moth balls, the important element, of course, is how many ships. You might have the capacity to get one or two or a half-dozen ships into service very, very rapidly. That is one of the fallacies of some of the thinking. Recently two ships were rapidly gotten into commission for the Turks or for somebody else and got under way. It doesn't prove you can put a big effort into action rapidly because facilities and manpower are not there to put a big effort into action. That sort of thing still has to be measured, and the conclusions you reach depend on how pessimistic or optimistic you are.

QUESTIONER: I was thinking possibly dry-docking might be one of the answers.

ADMIRAL WHEELOCK: Well, it will be in some areas and in others it won't. For instance, in San Diego where there are many ships and a relatively small capacity for dry-docking, if those ships are fowl, it will take time. There again, if we get scared soon enough or get a little warning, we can get ever so much better set. Submarines have to dock. Their propellers have to be cleaned up and in most cases installed. It depends largely on the magnitude of the effort, whether it is an all-out effort or part effort, and whether you have some warning or no warning.

COLONEL HOEFFER: Admiral Wheelock, on behalf of the College I wish to thank you for a very informative lecture.

(19 April 1949--750)S.