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FOREWORD

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THE ROLE OF THE NAVY IN FUTURE WARFARE

A lecture delivered by
Rear Admiral Charles R. Brown, USN
at the Naval War College
February 15, 1949

The title of my talk today is the role of the Navy in future warfare. In such a discussion my inclination is to immediately thrust myself into the future since the history of the past, however glorious, is of little but academic interest to us unless it has definite application in the future.

However, I find it impossible to proceed without first explaining my concept of the functions and purposes of a navy and this, in turn, inevitably leads me into a brief review of the past. So, if you will forgive me, I will broaden my subject to include the role of the Navy, or more properly expressed, the role of sea power in the past, present and future. For sea power has never meant simply navies alone. It has always meant the sum total of all weapons, installations, and geographical and other circumstances—all factors which enable a nation to control and exploit the sea during war time. One of the most important elements of sea power is shipping, in which is still carried (and for an indefinite time to come will continue to be carried) most of the men and commodities that move across the sea. It would be just as unreasoning to consider sea power in terms of warships alone, as it would be to consider railroad trains in terms solely of locomotives. A locomotive represents power—true enough—but, without cars attached, it is power with no functional meaning. And, without shipping naval efforts are equally negative. We may keep the enemy from using the sea, but that does not enable us to use the sea for ourselves.

Admiral Brown is Chief of Staff to the President of the Naval War College.

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The history of most great wars is rich with examples of shippings' contribution to the war effort. Most of the materials that went into the British aircraft that hurled back the luftwaffe in the Battle of Britain of 1940 were brought to the scene of operation by ship. Without shipping, not all of the guns, and tanks, and soldiers, *and airplanes* in the world could have saved Britain. And the same applies to the later bomber offensive against Germany. Most of the men, and the food they ate, and the fuel and bombs needed to mount that offensive, came across on a bridge of ships. Russian might was kept in the war by the food and munitions we sent across the sea. And Japan was defeated by the great American advance that was literally floated across the vast reaches of the Pacific.

We think of Germany's role in the last war as that of a land power only. But even she leaned heavily on her shipping. She needed it in the Baltic and the North Sea for support of her Russian operations and for maintenance of her vital communications with Scandinavia. She used it coastwise between Germany, the Low Countries, and France to relieve a heavily overburdened rail and highway system. And while Italy remained in the fight and an active front existed across the Mediterranean, shipping was an indispensable means not only of handling Italian coastwise transportation, but of maintaining military communications with the Axis armies in North Africa. And I might add parenthetically, the Allied offensive against that shipping was the determining element in forcing Rommel's retreat.

But nowhere was the need of shipping so compelling as it was with Japan. It is curious that, upon the entrance of the United States and Japan into war, the daily press made full comparison of their relative naval strength, but forgot to note that Japan had never more than nine million tons of shipping with which to carry on commerce and military enterprises over a vast maritime area. It

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was never enough and, with increasing losses to our submarines, aircraft and other weapons, her national economy rapidly deteriorated and then collapsed.

The ugly little tramp steamer thus occupies an important quarter of the shield of naval power. It is less splendid than the great aircraft carrier but no less vital. Both are ships and, to all the embattled nations of the last war, there was nothing quite so valuable as a ship. And it will continue to be so in the future. It is a fundamental law of Physics. That is, you can build a huge tub—call it a hull if you will—and float it on the surface of the water. It floats by itself, mind you; it requires no power to keep it afloat. You can fill it up with goods, or guns, or airplanes, or soldiers, and with relatively little power you can move it cheaply to any point you wish. There are no rails or roadbeds to worry about, no mountains to cross, no tunnels to dig. It is by far the cheapest and easiest means of transportation known to man. And the more our civilization advances the more we will come to use this cheap and easy road of the sea for all of our bulk transportation.

We are all familiar with the role of the naval airplane in the last war. It was used for search, observation and reconnaissance in every phase, and so distinguished an officer as Admiral Spruance has expressed the opinion that photographic reconnaissance alone provided us with a wealth of vital material which could never have been hoped for in the past and without which countless lives might have been unnecessarily expended. The airplane also proved an invaluable weapon in anti-submarine warfare, both in its own right and as a closely articulated member of air-surface hunter-killer teams. But it was with the aircraft carrier that the naval airplane achieved its most dramatic successes, for the part played by our carriers was dominant and indispensable. They assured us a concentration of air strength possessed of extreme mobility, range and endurance. They spearheaded and supported our amphibious ad-

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vance at every long step in the Pacific. The immense distances and widely scattered defenses offered great opportunity for the employment of these mobile forces which struck at great range and left all but selected targets by-passed and isolated. In a war in which command of the air was essential, they never failed to gain that command at the required time and place. In a naval war, they destroyed the enemy fleet and annihilated the air power of that fleet. In an amphibious war, they excelled in the direct support of troops. And all of these things, combined with the mobility and long sea-keeping ability of the American Fleet, gave their attack a feature of continuous initiative and surprise revolutionary in the progress of warfare.

Furthermore, we have now crossed a threshold. Using atomic bombs and other new weapons of science, the flexibility and destructiveness of the carrier airplane has been increased many fold. And the Navy, no longer shackled by the historic barriers of the shoreline, can now strike telling blows deep in enemy territory. For, with no intention of detracting from the land-based airplane but in simple justice to its carrier-based sister, it must be recognized that the aircraft carrier task force provides the only truly mobile air force in the world. Not only the aircraft themselves, but their fields are capable of rapid movement. It is therefore, a force with all of the peculiar advantages of mobility such as the ability to concentrate and the ability to achieve surprise while the land-based enemy struggles to redeploy aircraft scattered over hundreds of fixed fields which may be separated by thousands of miles. Redeployment of aircraft to meet such threats is next to impossible, so the blow must be absorbed by local defense forces. To be effective the enemy must be strong everywhere, a most difficult thing to achieve.

To state it in another way, the aircraft carrier may be said to gather up and coordinate all the principles of war and employ

them with prime emphasis on the principles of mass, movement and surprise.

The carrier's compact, self-sufficient organization gives conditions very difficult to obtain ashore, particularly in advanced theaters. The aircraft receive excellent upkeep and repair, and the air crews live in surroundings which enhance efficiency and morale. Air operations are served by a highly compact intelligence and communication organization which permits up-to-the-minute briefing prior to take-off and precise control in the air. Cruising in enemy waters, the task force is protected by its fighter patrols, a certain number of which may be airborne during daylight periods, and by its night fighters during darkness. These fighters are directed to their interceptions by highly trained personnel using excellent radar equipment. Radar picket vessels and airborne early warning sets extend the effective range of this radar many miles beyond the task force. Such enemy aircraft as can penetrate this fighter plane defense are met over the task group by a truly tremendous concentration of anti-aircraft fire which, directed by radar, denies the enemy planes the advantages of cloud cover and darkness. The heavier shells, of course, are influence fused and explode when passing within lethal range of an aircraft. An average fast carrier task group of the last war had a concentration of over 1600 guns to use in its defense. When translated into fire-power, gentlemen, that means over 6,000 bullets per second or just under 200 tons of steel every minute. This, in its ability to deliver hot metal, surpasses any conceivable concentration of artillery ashore. It was positively brutal and it is small wonder that even those Japs who were not suicidally inclined grew to consider an anti-carrier mission as almost automatic enrollment in the Kamikaze Corps.

Before leaving the carrier, I would like to point out that the carrier-based airplane is not and should not be considered as a rival of the land-based airplane. The two are capable of a bril-

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liant partnership which can multiply rather than add to the overall effectiveness of our effort. For in war, as in any organic phenomenon, the whole is infinitely more than the mechanical sum of its parts. Land-air power can and does operate over the seas and not only should this be recognized, but it should be welcomed and utilized to the fullest. By the same token it should be equally apparent and gratifying that sea-air power can operate over the land with equal facility and effectiveness. The defenses of the enemy can be spread thin by the more varied direction of sea-air power's attack making easier the more inflexible approach of land-air power. On the other hand, land-air power, by the crushing weight of its sustained offensive, can aid and abet these rapier-like thrusts of sea-air power. There is no duplication unless it is the duplication of the "one-two" punch.

New weapons have had a profound effect upon the thinking of us all. The blinding fury of atomic warfare unhappily represents man's most significant conquest since the discovery of fire. The historic balance between offense and defense has been utterly destroyed. To deny the impact of this on naval thinking would be downright folly. Indeed it would be courting disaster.

Every new weapon is a challenge to sea power; a challenge to recognize it, utilize it, and defend itself against it—or perish. Even those new weapons of the last war enormously complicated our problems. They opened new avenues to us, closed others, and in many cases circumscribed the profitable employment of the Navy. Today, we have atomic fission. Tomorrow (when it comes and it will come) we will have the ultra-long range guided missile with an atomic head. We must, all of us—ground, sea and air—learn how to utilize these weapons and how to defend ourselves against them. Victory or defeat, when and if we must fight again, will hinge upon the degree of our success in doing this.

By the same token we must never permit our enthusiasm for the new to cause us to prematurely discard the old. Certainly, we must cast away garments which are moth-eaten. But we must avoid swapping a serviceable coat for a new one that does not fit. Our job is to sharpshoot; setting our sights neither too high nor too low. We must come forth with the most nearly correct answer obtainable. We are no longer blessed with unlimited resources, and we must be certain that those we have are divided in the most effective manner.

In remembering that the war of tomorrow is to be fought with new weapons, we must not forget that so was the war of yesterday and the day before that. The unrelenting progress of mankind causes continual changes in weapons. Drastic change has been so persistent during the last one hundred years that (if I might be permitted to coin a phrase) change may be said to have become one of the constants of strategy.

And a review of the past will warn us against the dangers of being too quick to discard as well as too slow to adopt. For example, the opinions expressed between the last two wars on the role of air in sea operations were too often founded on theory motivated by personal prejudice. And to a large degree the utterances of both visionary and reactionary were ultimately proved false. Those who planned on naval engagements after the fashion of Jutland and Trafalgar were bitterly disappointed. Those who scoffed at the menace of the airplane saw their dreams go up in the black, greasy smoke at Pearl Harbor. But those who proceeded, because of the startling successes of submarines and aircraft, to paint with reckless brush pictures of war taking place wholly in the air or wholly under seas were found to be equally wide of the mark. False proclamations were issued that navies were obsolete, that the heavy bomber would interdict all sea lanes, that no ship could op-

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erate within reach of land-based airplanes, and so on; predictions which were not borne out by the experience of any warring nation.

Technology marches on a broad front. Its progress is not confined to those few implements which, today, seemed favored of the gods. Those implements which, today, seem threatened with extinction may sometimes use the same technology to develop tomorrow new means of offensive usage, thus furthering their intrinsic merit, and new means of defending themselves, thus continuing their useful life. What we will then have will not be a return to the conditions of yesterday, but something new and distinctive.

It is a great misfortune that a discussion such as this can seldom be indulged in without creating bitterness which generates resistance and, in the end, delays progress. The simple fact is that change must occur. To ignore it is disastrous. But revolutions are seldom as complete as revolutionaries hope, and the wise man must travel the unpopular and little publicized middle road, being neither lulled by the wishful thinking of black reactionaries, nor swept away by the rantings of wild-eyed enthusiasts.

But enough of the present. Let us look into the future. And as we look into that future we see many factors affecting the employment of navies. But during the foreseeable future it is equally clear that there will continue to be a place for navies—both their surface and air components. Indeed, so long as there are oceans there will be ships. No serious student of sea power (and these students are by no means confined to the naval profession) has yet to suggest that sea power is on the way out. It was no “happenstance” that the greatest of all air wars and the one which saw the most titanic land battles of all times was also the greatest of all sea wars. World War II saw sea power reach its heights in its influence on history; not alone in the magnitude of operations, but in the degree to which those operations contributed

to final victory. And, in any great war in the future, sea power is still as certain to be decisive as it formerly has been. Indeed, the greatly increased quantity and complexity of equipment to be used in future wars makes sea power even more important than ever before. Just as an army is useful in land warfare, for those who propose to fight across the seas, a navy is a necessary possession. In the hands of an intelligent and understanding high command it is an invaluable weapon. And I might add this:

Sea power is the friend, ally and indeed the proud servant of air power. For, with the aid of land power, it can seize, develop and support overseas air bases close to an enemy, thereby multiplying the effectiveness of air power by many, many fold, For if we cut the distance a bomber must fly in half we multiply its effectiveness by four. If we cut the distance down to one fourth, we multiply its effectiveness by sixteen. In other words, given the same size air force, we will have sixteen times as many bombers to fight a war at this range (indicating) as we would have if we were forced to fight out at this range (indicating).

This old law of mathematics applies to all weapons from the bow and arrow to the guided missile. The day of the long range guided missile is still many years in the future but, when it comes, navies will still be needed to take it closer to the enemy. Modern weapons are enormously expensive. This is true whether we are speaking of a jet bomber costing several million dollars or an atomic bomb the cost of which is a measurable percentage of our national effort. We must not waste them trying to hit a target thousands of miles away when we have the means of getting much closer.

So much for the foreseeable future and, for that matter, the predictable future which lies just beyond that. But what of the speculative future—the “wide blue yonder”, the day of the ultra-

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long range guided missile with an atomic head—what about sea power then?

First, let us examine the most accepted version of warfare in the atomic age. It seems universally conceded that, with our present type of government, we must accept, not deliver the first blow. I decline to subscribe to this gloomy view but, however you view it, such warfare is not attractive. Cities will be vast catastrophe areas, and the normal channels of communications and transportation will be in unutterable confusion. Even the smaller towns and the rural areas, though perhaps not struck directly, will be in varying degrees of confusion and disorganization due to the collapse of the metropolitan centers with which their economies are intertwined.

Of course, a great deal can be done in the way of passive defense, such as going underground and decentralizing and reorganizing vital industries and services, and adopting other methods to avoid complete paralysis of the nation. But the idea that a nation, after weeks of atomic warfare, could achieve a fraction of the production of America, during World War II simply does not make sense. The atomic war must be fought largely with stockpiles of arms in their finished state. Stockpiles of raw materials may be practically valueless; just as useless as that huge pile of gold we kept buried in the ground throughout World War II. And incidentally, let us not forget that gold too was once an essential sinew of war, and it is most doubtful that our forefathers ever foresaw the day when it would not be.

Thus it can be seen that our ability to strike back after an atomic attack will depend upon the degree to which our armed forces have made themselves independent of the urban communities and their industries for supply and support. In the past our military establishments have simply been cadres which underwent

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enormous but slow expansion after the outbreak of war. Such expansion cannot take place after an atomic attack. The idea that must be hammered home above all else is that practically the only forces which will be able to fight after an atomic attack will consist of those already in uniform using the arms and equipment already in the arsenals. And those arsenals must be in caves in the wilderness or otherwise suitably dispersed, hidden, and protected.

It has been suggested (and the suggestion seems sound) that the forces which will fight in an atomic war should be divided into three elements. The first will be the "Retaliatory Force", which will return the bombardment with our own atomic weapons. This force must remain in sharp isolation from the national community. Its functions must not be compromised in the slightest by the demands for relief from the stricken areas. The "Retaliatory Force" must either be a highly mobile sea force or one which has been scattered over a large number of dispersed reservations. Possibly it will be a combination of these two, but if a portion of the "Retaliatory Force" is to occupy reservations, each reservation must be of a considerable area to permit atomic explosives and their carriers to be secreted and protected as much as possible by underground storage. The entire "Retaliatory Force" must have a completely independent system of inter-communications, since the supreme command may have been eliminated or its communications disrupted almost immediately.

The second force will be known as the "Defensive Force". Its mission will be to resist invasion, to defend against the bombardment of atomic missiles by whatever scientific means that have been developed, to organize the relief of the stricken areas, and to administer the interior along as nearly constitutional lines as possible. Here, if anywhere, is the place for the citizen army. But it must be admirably trained and capable of at least local mobilization. There will be no time for training and nation-wide mobilization once

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atomic warfare starts. Perhaps the old ideal of the minute man with his musket over the fireplace will be resurrected in suitably modernized form. In any event, adequate provisions will have to be made for local mobilization, for maximum decentralization of arms and supply depots, and also for decentralization of tactical authority. Strategic rather than tactical concentration will be necessary to avoid high spatial density of military forces. And it must be again emphasized that the arms, supplies and implements of transportation to be depended upon will be those stockpiled in as secure a manner as possible.

One more word about the Defensive Force, there is a popular school of thought today that atomic war necessitates emphasis on pure defense and the expenditure of vast sums on defense alone. I cannot go along with this despite the hypothetical proofs advanced. History is too replete with instances of the "Maginot Line" theories that have fallen before a dynamic and well conceived offense. I do not mean to say our defensive forces will be unimportant, but no aggressor nation will be discouraged from attacking us because of the excellence of our defenses alone. She will be far more deterred by visible evidence that we have the offensive potential to deal her decisive blows.

And it is therefore to the operations of the third force known as the "Offensive Force" to which your most thoughtful attention is invited. The outcome of the war, the decision as to who is victor and who is vanquished (a sorry distinction at best in times of atomic warfare) will depend upon the strategic situation existing after about the first sixty days of war. I know of only two factors influencing the strategic situation after the first sixty days of atomic war. One is morale, always a gambler's choice when dealing with the speculative future. Building up a national morale of such toughness and resiliency that it can withstand the shock of this type of warfare is a matter of supreme importance to the mili-

tary thinker, but it is beyond the scope of the present discussion. I mention it now simply to indicate my recognition of the problem.

But let us return to the remaining factor influencing the strategic situation after the first sixty days of atomic warfare. This factor will be based upon the degree of success of the "Offensive Force". Remember the "Retaliatory Force" is engaged in bringing the enemy down to our own level. The "Defensive Force" is avoiding utter chaos. If the "Offensive Force" can seize and rapidly develop a section of enemy territory *which dominates the enemy's vital areas* then that force will be in a position to continue the *initial* retaliatory bombardment on a far more effective scale. Not only that but it will relieve pressure on the homeland, since much of the enemy's resources must be directed against the captured area. Thus we draw double on our money since the effectiveness of our own bombardment is increased while the effectiveness of the enemy's bombardment is decreased.

Obviously, the "Offensive Force" must be completely professional and trained to the utmost degree. The target to be seized must be of a considerable area but, since the forces available will be limited, it must also be one which can be fairly easily conquered and even more easily defended from reconquest. And it should be repeated that it must be one that dominates the enemy's vital areas.

Extreme swiftness of invasion will be of inestimable value. This makes the employment of air power most inviting and unquestionably it will be utilized to the limit. But the invasion, occupation, development and support of a considerable area solely or even chiefly by air would be an incredibly difficult task, even if we assume a minimum of air opposition. The task of the offensive force is obviously one tailored to sea power. But it must be a sea power geared to atomic warfare. Its organization, logis-

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tics and tactics must conform to the requirements of atomic warfare. Ordinary harbors and ports as we know them will be useless. Supplies, replacements and spare parts must be loaded over the beaches from dispersed, hidden and protected arsenals. All ships must be kept adequately dispersed at all times—even prior to the outbreak of hostilities. The invasion force itself must be already embarked, or at least capable of swift embarkation from hundreds of isolated points for, almost immediately, all ships must be ready to proceed to predetermined rendezvous and from thence to the chosen objective, where a swift invasion will be undertaken utilizing surprise to the utmost. It will be an herculean task, involving not only the seizure of territory but its development with incredible rapidity into launching sites suitably separated and adequately supplied.

There briefly sketched, is one version of warfare in the atomic age. As mentioned at the beginning, it is not a pretty picture. It is unnecessary to say that we all most fervently hope the world will be spared this Armageddon. But in the calamitous event that it cannot, our job as always will be to win the war. We must realize that a reasonable state of readiness by past standards may invite disastrous defeat in the future. During the transitional years that lie ahead of us, our thinking and our planning must remain broad and flexible to insure that we achieve a maximum state of readiness at all times.

Perhaps most of you will feel that I have painted a much too gloomy picture of the future. Well, I agree. I have my personal doubts that atomic warfare, horrible as it may be, will ever reach the cataclysmic proportions I have outlined. But a good planner must plan for the worst and hope for the best, and I have simply chosen the worst situation so that we might examine the role of sea power under such conditions. Actually, as I have said, I question the ability of even the atomic bomb to so completely

destroy such vast areas as our land presents. Further than that, I refuse to subscribe to a doctrine of despair. I decline to accept it as our inescapable fate that we must suffer the full measure of destructiveness this terrible weapon does possess. I heartily subscribe to the homely old saying that: "There ain't no holt what can't be broke." Science presented us with atomic warfare. Science must provide defenses against it. She may not, indeed probably cannot find a complete answer, but she *must* give us something which will offer humanity a more reasonable chance of survival than the measures that I, as an unscientific student of warfare, have been able to outline today.

But, whatever the specific changes indicated by atomic warfare, this much is clear. Our military leaders must bestir themselves to a wholly unprecedented degree in revising military concepts inherited from the past. They must be prepared to dismiss as possibly irrelevant lessons learned the hard way in the last war. This will not be easy. It would be much easier if we had lost the war, or had our leadership been stupid, blundering or marked by unnecessary delay in adjustment. But such a judgment is not correct in spite of the malicious slander of lesser men. I do not contend that no mistakes were made. But, on the whole, our leadership was unquestionably brilliant and remarkable in its flexibility. Our ground forces proved to be masters of mechanized and amphibious warfare, our navy was not found wedded to the battle-line, crossing-the-"T" type of warfare (and don't let anyone ever tell you that, no matter who he may be—no navy ever handled air power more intelligently or effectively) and our air force, though sincerely wedded to the theory of pure air power, rendered timely and invaluable close air support to the sister services.

The problems we face today have grown too great to be solved by the "specialized" thinking of the past. The crying need

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today is for large numbers of military thinkers who collectively will represent a “super” Clausewitz or a “super” Mahan—brilliant strategists, not of land power, not of sea power, and not of air power, but able broad-gauged individuals who can view the whole picture of *military* strategy and come forth with well-reasoned and dispassionate answers to the warfare of the future. I am not speaking of a super general staff, but of the leaders within the several services. Perhaps such paragons can be found just as great needs in the past gave us an Abraham Lincoln or a George Washington. But they will not come unless the irresistible urge is built up to find them, to know whom we seek. This means that those of us of the military cloth must cease our “compartmentalized” thinking. We must realize that we are not, per se, army officers, naval officers, or air force officers. We are *military* officers (and by God we are Americans too!) and we must, each of us according to our several talents, strive to see the broad picture without personal or service bias.

ECONOMIC POTENTIAL OF THE UNITED STATES FOR WAR

A lecture delivered by
Professor W. Y. Elliott
at the Naval War College
November 19, 1948

This is a second installment, but the President of the War College has suggested that I refresh your minds on the whole problem before emphasizing supply problems and organization.

On the Economic Potential of the United States for War, what I want to do first is to lay before you some problems that seem to me to “set” this problem itself in terms of the questions it involves. What do we mean by “economic potential” and what do we mean by “the United States for war”? I don’t mean to get into semantics. I do not think that would be very profitable. I propose to make a plain, common sense analysis of what you’re up against.

The main job I had to do in the first three and one half years of the last war (from 1940) was to concern myself with the strategic imports problem. I don’t think it is necessary to indicate the importance of that problem to you, but it obviously has the most direct bearing on the question about which we are talking at the moment. Economic potential for war can be studied in terms of the import program and the deficiency materials almost as well as from any other angle because you have to study the things that we have and our production potential as well as what we haven’t. When you have a deficiency in strength and when you know the processes through which these materials come, you understand what the “United States” and “war” really means. It means the

Professor Elliott is Professor of Government at Harvard University and was the wartime Vice Chairman of WPB. This is the second of two lectures by Professor Elliott on the subject of economic potential.

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world. The potentialities of the United States have to draw on the world.

Now that is, unfortunately, a lesson that is not generally recognized in a great deal of top-level planning in Washington. The assumption is that the Navy is an old fashioned instrument of warfare which somehow is a little bit out-moded by the fact that you can fly over large areas of the world and deliver knock-out punches if you can get there, not "fustest with the mostest men", which was Bedford Forrest's formula, a fellow Tennessean's, but get there with something lethal in the way of a knock-out punch. But you have to get there also to mop up, even if you *can* deliver such a punch, and you have to get there to protect yourself, in the first instance, with the supplies for bases from which you can deliver these knock-out punches. Like a great many other problems which you study and are much more expert with than I profess to be, this is a primarily military aspect of our national strategy. I hope our top-planning is good because everything else depends on this estimate.

Just common sense thinking on this point would indicate that the protection of our sea-lanes is necessary to get in over 200 strategic materials. (260 were on our W. P. B. list at the end of the war). On the A. N. M. B. strategic and critical list today you have about fifty or sixty materials and you have another hundred that are doubtful and would soon become critical and strategic. Just take my word for it, they will all be there within six months of the time any war is fought, because wars always develop more shortages than anyone has foreseen.

The first proposition that I want to call to your attention, then, is that when we are talking about the United States at war, *we are talking about the United States drawing on any accessible parts of the world.* The places we can control in the world, the

sea lanes that are available to us, (to which I propose to return) the places that are not likely to be interdicted by communist activities (and that is a very real part of our equation from here on out) become critical to the success of stockpiling to prevent our being dependent on areas where we are likely to be interdicted from materials which we may desperately need. Our potential depends on control of sea-lanes and producing territories.

What about the rest of our own United States' economic potential at this time? Let us start off with an analysis of that and break it down into the three points that I have suggested to you: (1) our natural resources that we have to depend on for the entire raw material supply of this country (and that includes food-stuffs and all the agricultural production in a very definite way because we are going to have to feed other people as we always have); (2) our industrial capacity, and (3) our manpower. Those are the three basic factors, if I understand them, that enter into any economic picture of war potential. Industrial facilities and capacities, of course, are the things that get most of the attention—the things we spent most of our time wrestling with in the War Production Board, though without the other factors being in balance, they sometimes got out of balance. Industrial facilities could be useless without adequate transportation, raw materials, components, and manpower, in a proper balance. Sometimes production suffered very greatly even in the war in which we were protected the last time by the intervention of that Providence which seems to have a peculiar concern for us, along with the other objects of its traditional affection which I need not name.

No Slack in Our Present Peace Time Economy.

At the present moment we are absolutely at capacity in steel and are far behind requirements—five million tons at least. We are not able to meet our needs in the production of electrical energy,

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(which is an absolutely critical factor, as you gentlemen all know, for all our war potential). We are short in the mining of every non-ferrous metal in the picture, and we need all the iron ore that we can lay our hands on. We are not at capacity in coal, but we are pretty close to it, and any slackening of that front would be serious. We *are* at capacity in metallurgical and by-products coke. We are desperately short of scrap for steel making purposes. Scrap is the biggest single limiting factor in steel production today, apart from strikes (which we hope will not be in the picture but may be if the inflationary spiral is not controlled).

If you take the three or four other lines that are absolutely vital to war, such as the production of specialized bottleneck items: gauges, compressors, valves, (the things that you gentlemen know held up the escort vessel program when we got into a very tight jam last time)—those things are pretty well within capacity.

We are behind in the oil country goods, which is the major factor in petroleum production today, so that you can't get 24 inch pipe orders on any mill until 1951. I mean that the existing orders are not going to take care of the production of petroleum in an adequate volume. It is a world picture I am talking about, which we are having to supply. Petroleum is domestically now just about within peacetime demand, with no reserve for 100 octane production and other products for war.

Now that is only *peacetime* economy. You are not taking any big slice out of that for defense today. You will next year (1949) take a bigger slice and with the lend-lease program for Europe, that is in my judgment quite certain to go into effect. I think the stage is set. You'll take a much bigger slice out in later years; but you won't take a "wartime" slice out of it, unless we have a war. So that when you are talking about war potential you have to squeeze it out of present civilian requirements, or find

additional facilities, (which in the main do not exist at this time) in order to carry a wartime load. Now that is exactly the cold factual situation that you are up against—no slack in the industrial economic potential for war requirements and none likely unless we hit a severe depression.

You haven't any factor in the 1948 situation that does not correspond in some way to the situation which we confronted in 1940, but there was slack in the production facilities then available. When I went down in May 1940 with Don Nelson, Bill Batt and Ed Stettinius and the rest of them, (and they were pretty much recruited from the Business Advisory Council, a group of people who had been working on this in one way or another for a long time) we had some slack, though we didn't have *enough* slack. Yet we faced the same general problem then that we have today. If you were going to increase steel facilities, for instance, adequate to get wartime production of steel up to the figures that we regarded as necessary, somewhere approaching 90 million tons, (and there were a lot of people who said that 100 million tons would be necessary, if we were to do the job) every ton you took out to increase steel capacity in 1940 wasn't getting the bait back until three years later, and you were taking it out of current production in the meantime. How much steel could we invest in a long run expansion? Could we squeeze it out, without hurting immediate rearmament needs?

Today we confront that same problem, only in a more exaggerated form, because steel capacity was then running at about three fourths capacity at the most, and we had some leeway to expand against existing capacity. We don't have that leeway of steel capacity today. We have furnaces that have been running until they are, in many instances, worn out and badly in need of replacement. Some of them are being replaced and steel production is

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suffering somewhat in consequence. Expansion in steel is going on, but we won't list a 100 million ton figure at present rates before 1952.

There is, to sum this all up, a peculiar kind of handicap, from a wartime point of view, in our present full employment economy. Everybody is used to this high plateau of civilian consumption; plans are going ahead on that basis. We are not an easy economy to plan for war, even on a sensible basis of preparedness before the event. Now I hasten to add that that is not *all* a bad proposition because a lot of new industrial capacity is being put in which can be, with very little conversion, used for war time purposes out of this new peak civilian requirements load. You are dealing with an economy strained to its utmost with the E. C. A. program on its back, with increasing demands confronting you next year, *certainly* increasing demands for our own military requirements. There isn't any possible doubt that the outcome of this election did not affect that in any very serious way, although whether it would have been greater or less is a matter of speculation. In any case, we are committed to an increase in the arming of this country and we are, though not as yet *definitely* committed, almost *morally* committed to a rearming of considerable parts of western Europe and certainly China, if it remains in the picture. It looks as if enough of it had a chance of remaining there to require *some* rearming at any rate. This load will include a larger share for the recovery of Japan. We have been guilty of allowing the Japanese economy to remain relatively idle and almost useless for even its own recovery and a direct drain on us, much as we have handled the German economy up to quite recently. Both must be put to work or they too drain our economy instead of helping to rebuild the world on our side of the Iron Curtain.

Now I want merely to throw in a footnote at this stage, which I intend to develop later. Whether or not we have inflation

in this country within the next eighteen months, possibly within the next year, in steel products, including pipe lines, oil country goods, is very largely a matter of using available German production. We should be able to draw upon Germany, as we could with any kind of consistent and absolutely all-out effort, if we brushed aside the objection of the British to the competition being reestablished and if we retained in Germany the steel capacity that is there. There is sixteen million tons of annual steel capacity in the western zones which is, at present, producing at the rate of seven million tons of steel a year. Nobody would have given you five cents last year for the chances of its producing at a rate of more than six million tons by this time, at the outside limit. It's actually producing at above the seven million rate.

We have to get more Swedish iron ore in that picture, or iron ore in adequate quantities and adequate volumes from somewhere else. We have to do something more about German transportation. But if we were running a war we would do these things. That was precisely the kind of thing we *did* have to do during the last war, and that would be the biggest check to inflation that this country has faced. And gentlemen, inflation is the greatest danger of starving our military programs and our overseas objectives all across the board. Now am I wrong in that simple analysis? I don't think so. But I want to develop it for you to see whether I am.

On our own potential we are short at least five million tons (some say up to ten) of ingot steel to meet the total requirements that are going to be put on us by the combination of military programs, lend-lease included, the E. C. A., whatever we do for the rest of the world. The Commerce Department estimates run as high as seven million tons of basic steel, while the Interior Department estimates are quoted at the higher figure of

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ten. This includes the commercial steel export for the world which we can't cut off without simply wrecking South America, etc. That steel capacity for quick use exists in Germany and nowhere else. There isn't the capacity for developing that steel making capacity in the U. S. A. under three years' time. Six million tons of German steel capacity are due for scraping. We agreed to do this under the pressure of the Russians, and with some backing of the British who didn't like this competition, and because the French thought at the time of Potsdam—and until recently that they ought to control the Ruhr and destroy or take over that steel-making capacity. Now those are all factors that need to be dealt with but I can't get into them too extensively here.

Transportation Equipment and Oil Country Goods as Shortage Items

Now second is transportation equipment, which is the limiting factor in the second major inflationary item with which we are confronted namely; the development of minerals all over the world, transportation equipment, oil country and mining equipment. That's steel. If you have the steel you have the capacity in most places, and you have German capacity, much of which is being disassembled at this good moment and shipped, some of it behind "the Iron Curtain". It is an incredible thing to be shipping big pipe-making equipment even to Tito, and certainly to ship it to Czechoslovakia, Poland or Rumania. We have stopped shipping it, for the time being, to Russia because of the counter-blockade to Berlin. But we are always apparently willing to do a deal along those lines and go on with it at some time when things get a little bit tougher. It is always held out as a bait, twenty-five per cent of reparations equipment from the Western zones of Germany is still earmarked for shipment to Russia today in the I. A. R. A. allocations of this stuff in Germany. That apparently cannot be touched, even though Congress has passed a law which says that the E. C. A. should get a new deal on this whole business and should use that steel

capacity for the recovery of all of Europe. Since we were putting new money into Western Europe that never was contemplated when the reparations were originally settled, we should have a new settlement of the whole problem to use that money where it would be used most quickly and effectively.

Lend-Lease as Military Insurance for our Huge Stake in Europe.

Now obviously we do not want to build up that capacity for armament purposes before there are fifty European divisions, British and American divisions, able to stop the Russian armies from overrunning Europe. It would be a tragic folly if we were to build up heavy armaments in France in response to de Gaulle's pressures. To build them up in England makes more sense, but to build them up in France makes no sense whatever. Their entire steel production, their entire recovery program, ought to be geared into recovery items in *light* arms. The mass production of heavy armament ought to be entirely restricted to the United States until you have such protection that you know that you are not delivering over the entire arms industry to Russia.

I suggest to you gentlemen, if you have anything to do with these staff conversations, get that thinking into the picture, or at least think about it yourself to see whether it belongs in the picture, because the pressures are all going to be to go through the same old pattern of having uncoordinated equipment. I like the G. P. F.; it's a darn fine gun, and it was in 1917, but it is not the kind of proposition into which to turn steel with the French methods of production. This is particularly true until you are sure that it won't be turned against you. Tanks and even cruisers and Naval arms make no sense whatever in terms of building that kind of thing up at the price of "recovery" steel today, inside Europe. Please think that one over, in view of the tightness of steel at the present time! Use German steel for European recovery; keep the heavy arma-

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ments for Europe in this country mainly, with Britain perhaps providing her own on a coordinated basis. Other commodities than steel and minerals are easing.

If I have emphasized steel, it is only because steel is the key-index to war production. We found that out in the control material plans that Ferd Eberstadt (for whom I'll say a good word as a boss, because he was my boss), had the guts to ram down the throats of many reluctant people in the war. It's the index; everything gears into steel production and that's the reason I have been emphasizing it. But there are nine other items at which, in this country, we are chock-a-block at full capacity.

We have eased off in food production, that is no longer an inflationary item. Can we expect the climatic cycle not being repeated indefinitely? We have had eight good crop years on end. I don't know, Joseph's interpretation of Pharaoh's dream may not be the right one, "Seven lean years and seven fat years", you remember the Bible. (I hope the Navy hasn't stopped studying the Bible because you've got to seek comfort somewhere these days!) But we are due for a drought year pretty soon. We have had the most magnificent and incredible miracle of crop production and climatic luck in the world, and so we can't count on that indefinitely. But, thank heavens, for the moment, food is on the decline as an inflationary item and certainly you are as concerned with it as I, a professor. That item in the family budget is still tough; it is still bad, but not a critical item. Still we might do well to keep our elevators reasonably full as Pharaoh did, against emergencies. Crop failures still occur and food is a mighty weapon in war.

Textiles are out of the inflationary woods. Textile production is now sagging for lack of demand. The day of six and seven dollar shirts, I venture to say, may be over. You can go

through consumer durable goods, too, and things of that order (except where they are closely related to steel production) and the consumers non-durable goods, the kind of goods like automobiles and things of that sort and, by and large, the market is getting along towards a saturation point. So you are really out of the woods in most of these items, but you are *not* in these basic factors that effect the elements of munition supply and war production, which are most important—the ones I named beginning with steel, electricity, petroleum, the minerals, building materials, etc.

Now what does that spell? It spells, if I understand it, two things: first, that in order to get the potential for war production geared up, we have to gear it up *now!* We are looking right down the possibility of a war at any moment. There is, however a most encouraging thing about it to me. I was a civilian requirements planner and fought the last year of the war with *Vogue* and *Harper's Bazaar* and *Vanity Fair* to keep the dresses short, not because I was interested in the least in admiring the legs of the ladies, necessarily, but because I had to save cloth, so that you gentlemen could have enough uniforms and all the other things you wanted, including enough sleeping bags to sleep everybody in the Army double, from here to kingdom come. I fought that battle both ways—to cut sleeping bags down and keep dresses up. We *did* keep the dresses short here. When Moscow adopted the new look the other day I breathed a sigh of relief. I don't believe that Vossneshensky, the old Politbouro planner there, would have let them put the skirts down until he thought there wasn't much danger of an immediate all-out war. He is a pretty careful kind of planner; his neck depends on it.

I suspect that is a very good sign that the cold war is going to be cold for a while—that taken along with a lot of other things. Although the Soviets aren't set for it today, they could overrun Europe any time they wanted to, and the temptation to do it under conditions of stress, might force them to do it even when

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they don't *plan* to do it. That's the tragedy of it. So, looking down the guns that way, we as a nation, living in fat and security and comfort and all of that kind of thing, just can't bring ourselves to take the necessary steps to plan for such a struggle as may burst upon us. We take comfort in the new look coming from Moscow and other hopeful omens. Particularly unless we can mobilize the resources of these occupied countries, Germany and Japan, we still have a great inflationary strain on our system that is almost unbearable, and can be politically dangerous. We are asked to bear too much. "The weary Titan", as Joseph Chamberlain once said about the British Empire way back in 1902 when it was far from being true perhaps but he was predicting a true future, "The weary Titan staggers under the too vast load often his fate." It is we who now play the Atlas holding up the world. We must keep our people willing to support this load, and the only way I can see to do it is to mobilize the resources of other people for recovery purposes in Europe, while keeping the production of the things that are absolutely essential *now* in this country where we can control and coordinate their production and where we can control the arms and munition supply.

I needn't allude to the South American arms program, which needs to be restudied in the light of this total global picture. The uses of that program I think are too apparent to need comment. When you control the sources, you control a great many other things too. It is exceedingly important, gentlemen, it seems to me, that we should think in terms which are, after all, entirely legitimate terms of national interest to the people who are going to bear the brunt of it in the long run, so far as the sacrifices are concerned.

Now I hasten to add that the Europeans, on their part, have got quite a legitimate grievance if we begin to talk about abandoning them, and if any misleading talk comes to them that we

may retire behind the Pyrenees or something of that sort. That is not a good line of doctrine, particularly if we consider psychological aspects of the cold war. Let us talk about fifty divisions, (their divisions mostly), equipped and put into the field so that the European people will not have the feeling which they legitimately do have today—that they may be the first to have heads roll. Until we can coordinate ourselves with an Atlantic agreement, backed by actual divisions along the lines presently being studied, they will still have that feeling. So everything I'm saying is predicated, from my point of view, on the fact that we all can, with certainty and speed, stop the Russians in their "irresistible power" that they have on a purely relative basis today. I think it can be done, but you are better judges of that than I am, I leave it to you. Perhaps the whole psychology of Europe could be changed by fifty reliable, high powered, divisions and plenty of tactical aircraft (not just long range strategic bombing) if you have got them in a position where they can be used. The trick is to get the psychology that will make these divisions really reliable.

Now with that assumption, the second line of argument which I am going to lay down is that we must be prepared at the outset in the United States, to take the most drastic measures with our economy that anybody has ever contemplated. And I am speaking to you as an Ex-Vice Chairman of the W. P. B. for civilian requirements, the Director of the Office of Civilian Requirements. What we did last time would be completely inadequate, because at the outset of any war today we would have to face two things that did not exist in this last war.

More Drastic Cuts in the Civilian Economy would be Needed for a Future War.

Now let me start off by saying this, so that I may make clear to you that I am not trying to sell out the civilian economy

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which I really value and whose importance I think the military often do not understand. Certainly Lucius Clay didn't always understand it last time. Others in the armed services had a very imperfect understanding of it, if I may put it that way. You can't stop the civilian population from rolling around in automobiles completely, without stopping men from going to work in war plants. Our transportation system is not like that of some other countries, geared to bicycles. We *do* depend on the automobile to get around, and it is very important that we should have an enforceable provision for legitimate users of gasoline to get it. But it's going to have to cut a lot deeper and a lot farther, if we are going to support a war effort again, than we ever thought about last time.

Why? Not only are we at peak of consumption today in many lines. In special areas we have added to our national burden. We've turned everybody to the use of petroleum for fuel. I just installed a new oil heater in the gardener's house over next door. I turned to oil because it was easier. It's expensive but it's easier. If I'm going to put some of my family over there or rent it to somebody, they will want an oil heater. That's a very wasteful use of a very vital natural resource. A country that was properly run, on a long-time interest, wouldn't permit that. That's right. It really wouldn't permit the use of petroleum resources for immobile fuel purposes where coal was adequate. But *we* do and we are all geared up to it, and it would wreck a large part of the whole economy if you pulled it out. Petroleum is just one of those things that's right up to the notch today, or just about. Not only fuel oil but distillates and crudes.

Dangers Through Sabotage.

But there is a more important danger—loss of production by sabotage. What would happen if we got the additional factor

of sabotage on a wide scale, as we will certainly get in the only future war we are likely to have to fight. When I set up the lecture on civilian requirements which I made at the Industrial War College, they asked me to figure out what the civilian requirements ought to be next time, in fifty minutes of an off-hand talk at the college. Out of the richness of my experience, would it be enough to go back to the 1936 averages the way we used to do, and say that we could squeeze along that way with rationing? No, that won't do at all! You must have three alternative plans to confront a war today in terms of the damage that's done, the cutting off of natural resources, and the levels at which you have to cut civilian requirements.

One of them is the "soft" plan, which would probably never go into effect, but for purposes of propaganda you might keep it on the books. That would be a plan like last time. The minute war broke out, the minute you were confronted with a war tomorrow sometime, you'd have to go into at least a second plan, which would be the "moderate" plan, though a tough plan it would be too. We should have to cut, in my judgment, twenty-five to forty per cent below anything we saw last time, all across the board, and maybe farther than that depending on whether you got hold of the schnorkel submarine warfare quickly. I don't know how you feel about that, but the gentlemen who do scientific sound ranging stuff up at Harvard don't seem so optimistic about it. After your adventures up in Newfoundland recently maybe there is some little doubt in the minds of other people. The second plan would cut back about where Britain was in 1943.

I would think that you should count on really severe sabotage and really heavy losses as the basis for a third plan, so that you really would be geared into something where your planning would be adequate to meet potential disaster. I can't see how

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strategic planning today can be otherwise than in terms of alternative plans with depth of degree. That sort of cut would leave the civilian economy with little except its past fat and repair parts to live on.

Now if that is correct about the war potential of the United States, what looks like a very healthy situation from the point of the highest volume of steel production that we have ever achieved in peacetime, of very elaborate industrial mechanism, some plants still on ice from the last war that we could turn back to for munitions production and so on, is far from being a guarantee of adequacy.

How Much of the World do we Carry on our Backs? With what Help?

Let me ask you what you mean when you say "the United States at War?" What kind of war? How much of the world do we support by our effort? That will affect the problems I haven't spoken about yet. Why today we have four months' manganese in this country. Four months' manganese is hardly an industrial stock for operating purposes. Industry *never* got below about a year's operating stock, except in a disastrous time in World War I when we nearly ran out. And if we ever ran below fifteen months in the last war we got worried, terribly worried. So we just didn't do it as a rule. Even when we were tightest, we found bottoms from somewhere (lucky they were going out to those areas anyhow) to load manganese from India. There are 400,000 tons of manganese above ground in India waiting to be moved today. The Indian government is apparently willing to move it if we have the steel to swap for manganese. It looks as though we might do it if the State Department can make up its mind that this is the kind of thing that is respectable for a sovereign government to do. I don't know why we shouldn't, and unless we do, we are not going to get that manganese.

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It is the same kind of deal we have for Takorati battery grade ore; I don't think that the American interests concerned are quite playing ball with us there. They may need more help, but they don't show great alacrity to increase production.

The E. C. A. doesn't seem to be moving in these areas adequately and fast enough. They are not taking into account these long range development plans. They are not allocating funds to the colonies ear-marked for colonial development. They haven't brought in Southern Rhodesia in the bilateral agreements. As far as I can make out little has been done about the car supply to get the chrome out of Rhodesia, and Rhodesia hasn't even acceded to the agreements that are part of the E. C. A. program. The British say its a self-governing dominion now. Whenever they want it to be a self-governing dominion, it is one too, but when they *don't*, they run it. Legally it is still not self-governing. The car supply there is absolutely vital and the British have at last, bless their souls, put a good railroad manager down there. They are beginning to move, but in the meantime there are hundreds of thousands of tons of fine chrome backed up for the lack of railroad cars—bogie wagons and agreements on the part of Portugal to use Beira more efficiently. We used to argue bogie wagons during the war, but when they had to have bogie wagons we got them for them.

Why not use our Bargaining Cards?

The port of Beira needs fixing up some. You'd better get interested in that one. You may have some work to do there, if you are going to get this stuff out. Lourenco Marques may bear some attention too, and it's one of those deals in which you'd think we would be able to have some bargaining power. We are going to have to learn to use our whole bargaining weight with the E. C. A. in one way or another. The Portuguese don't take many grants or loans, but they are beneficiaries. They are taking short materials

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that require export licenses from this country and it looks as though we could find some way to reason with them.

If the United States is going to be built up for the needed war potential we must take steps of this character to increase mineral supplies in time. The State Department says, "We cannot understand why Russia doesn't cut us off of manganese today." Well I understand that, I think. It is very much to the advantage of Russia to have us dependent on them for twenty per cent of our manganese, and twenty-five per cent or more for metallurgical chrome, isn't it? If you could get this country dependent for its industrial structure to that degree on Russia, wouldn't you think that would be a sizeable advantage from the Kremlin's point of view? I would. In other words we didn't need a ton of that stuff from them to run the biggest war in history and supply them with eleven billion dollars worth of lend-lease during the war and a lot after. Today we are in the incredible position, in our chief basic materials, of depending on Russia to that degree, and at a growing rate. It isn't necessary! The slightest bit of drive to clean these things up would see to it that we got the bogie wagons into Rhodesia in return for additional and speeded up deliveries.

It is possible to deal with people on that basis. It *has* been done before, and it can be done *again*. The E. C. A. has the greatest persuader in the world if they are prepared to use it: funds of enormous proportions to go on colonial development. But if we give them as unconditioned grants to the colonial powers of course we won't get stockpiles from added production.

Useful Hints on Mobilizing Manpower from British Experience.

I'm going to pass over man power very briefly. I said some things about it in a lecture at the Industrial War College and I don't want to repeat those here. It's quite clear that no kind of manpower handling like that of the last war would fit the all-out,

full employment, situation that we confront today. The British handled that problem under conditions of much greater severity and strain, and bless their souls, they showed they could take it. They did an awfully good job; we can learn a great deal from them. I suggest that we should study their methods. One of the smart things they did was to put the man who is running their foreign policy today, Mr. Bevin, in charge of running their labor and manpower problems for a considerable part of the war, and a labor man was in there even when Bevin wasn't. In other words, British labor had a feeling that they were doing it through somebody who understood *their* problems and who was *their* man, but they were all out for saving England and they were prepared to do it.

Now it would manifestly be impossible today to rely upon merely the incentives of higher wages in war industries, or something of that character, to deal with the manpower problem. I dare say at this good moment for the period of cold war, we could rely upon companies turning over to the government for their use, men from these companies, on quite the generous basis they did even in the last war. There must be a safeguarding of the jobs for people on the higher levels in companies, just as much as there was the safeguarding of G. I. jobs. Otherwise we are going to find it very difficult to get top men who are free of strings. There must be an increase in salaries paid to top-level executives in the government if you don't want to have just "dollar a year" men. I think the latter behaved, in the main, with complete integrity. I have absolute confidence in the ones that I knew in my own shop. But it's an awkward position. Sometimes they had to lean over backward against their own companies, because they were exposed to the feeling that they were still employees of the company from whom they were drawing their pay. That didn't always improve their future prospects. Many of them looked for other jobs, after the war.

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Manpower demands an approach in terms of a total mobilization. If we are "all-out" next time, that may be an entirely different kind of proposition from what we have been looking for. And I think, there too, the plans ought to be made on three levels. One would be a MacNutt manpower program if I may call it that. MacNutt did an honest job, as best he could, with the kind of manpower set-up that he had and under the political directives that he was given. I think you have to say that. He is a good politician and he did an honest job, the best he could. But that isn't going to be the kind of job that you can do and get by with next time. So that the war potential depends upon the setting up of plans now.

Strategy of War Affects all Planning and use of Potential.

But can they be set up now for this drastic kind of war? Sometimes you must be baffled by political limits to your own military planning. I'm not going to try to outline the war plans you people make, but pretty clearly any kind of war is going to be an "all-out" war, even if it has the most limited objectives in the beginning, and even if you use your resources according to the maxim of Bedford Forrest (as I hope you will) and try to knock out the oil supply of the Russians (which would be the sensible, smart thing to do). If we had done that to the Nazis earlier, instead of knocking out ball-bearings and knocking ourselves out, it would have been much better. As soon as you can cripple an army from moving, they become a horde and it doesn't take many divisions to stop a horde. It seems simple, and all things ought to be reduced to simplicity if they are capable of it. To interdict oil would seem reasonable, but you have got to have an "all-out" effort to do *that*.

At the present time the 70 Air Group Plan doesn't make any sense whatever without so many more thousand transport planes in it than we seem to be thinking about. They would just be floundering if you were just going to use them as tactical air-

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craft even for strategic bombing, if you were going to depend on that. Just think of the logistics of it, and suppose you got half of what you've got in The Berlin Airlift knocked out tomorrow! Where would your air support be then? I'm talking about C-54's and C-47's, the flying box-cars, and the work horses that you must have to move people around under modern conditions. The balancing of an air force has not been thought out or acted on. We really have lost everything if we can't move cargoes by sea, but there may come a time when we will want to move some stuff fast by air, and a lot of it. We need to have the cargo planes for that, no question about that, but the great work horse of the fleet and the merchant marine is the thing that keeps any kind of war going, and its bound to continue to do so.

I have kept stressing, "What kind of War?" Are we going to repeat the errors that every people make in history? I don't think it's limited to democracies. Dr. Berrening, the former Chancellor of Germany, tells me that it was a favorite characteristic of the German General Staff too (which was supposed to be a pretty good one) of fighting the last war, if not the one before last. You are lucky if you just fight the last war. I don't mean that wars change completely; they don't. The basic characteristics are always pretty much the same, and no nonsense about that. The weapons and fire power and so on must be there.

Possibility of an Anti-Schnorkel "Manhattan Project Approach".

But we have two or three propositions that surely are staring us in the face in any long showdown with Russia. To get on top of the schnorkel submarine, may be worth a Manhattan Project. Maybe it ought to be treated that way because there is nothing really more important to our total defense and our sustaining war potential, I would think, than this. If you can't deliver troops to those areas, what good does it do for you to plan an operation? If you can't support them by supplies, can you depend upon anything?

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Now you may have all the answers to that and I may be just an alarmist, but I should think the proposition stands pretty much at top priority. It can be licked if we prepare to go into it, just as we did the atomic bomb, with a real concentration of effort and money no object. And it had better *not* be any object, because all these other things *depend* on that. The E. C. A. is not worth a nickel without that; it's a complete waste. If we are cut off from Europe, the E. C. A. is just complete nonsense.

I would think that guided missiles have a part in this far more important than strategic bombing, if I understand the problem. I used to watch the Air Force put up a lot of planes and come back, when the jets were operating, with quite a lot of holes knocked in them. Now if the Germans had had enough jets and plenty of gas it would have been awful. I don't know how many atomic bombs one would want to trust to long range bombing under those conditions. You may—that is a military proposition. But guided missiles with atomic warheads, so far, can only be delivered from limited distances. They are still in a highly experimental stage, as we all know. We had better get that range extended and the accuracy and the other things increased at all costs. To be able to deliver the atomic bomb and to know that it is not going to be turned on you, is just as important as *having* the atomic bomb.

I would think that kind of war is the thing to talk about and therefore I'm suggesting that the concentration of industrial potentials in this area and the kind of raw materials that go into these things are the most important part of pre-planning a war. Scientific effort today must be the number one factor in our war potential.

Industrial pre-planning for changed specifications and substitution can also change greatly the problem of economic potential. Pilot plants, for the experimental increasing of production of

those things that are absolutely necessary for a new kind of war and an old kind of war, should be a part of pre-planning. Unless they are undertaken by government or through subsidies, commercial ventures are not likely to explore them adequately. If we had had the lime, soda, sinter process worked out, and, in a position to put in at least a blueprint stage for producing alumina, we could have used run of the mine Arkansas bauxite very much sooner. We would have been ready for it at a time when we could have changed over without knocking the escort vessels out as we did. We lost so many ships going to the Guianas for bauxite that we finally had to do it. I think that kind of substitution process (study and pilot plant phase) is part of the planning of war potential now. Pilot plants and changed specifications to domestically available reserves or substitutes may save waste effort in stockpiling if the plans are far enough advanced to operate quickly.

Now let me wind up by asking you this question. We are going to have to supply other people to some degree, and nobody can estimate the magnitude of that burden. It will depend on time schedules. Today we would have to supply very few after a limited time, except with guerrilla weapons. How long could Japan, e. g. be held today? The Lend-Lease program would have some significance for Europe. In any case we are certainly going to have to supply other people to keep them going in some parts of any war. South America will always be a burden, we can't neglect that in our calculations. It has to have exports from this country if we are to get imports in return.

Organizational Problems.

How are we geared up to perform all this organization of the economy of the United States for its maximum potentialities today? There ought to be in being, ready to work with, a series

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of directives on the books and ready to put out tomorrow, that have been very carefully studied. A reserve corps of people already appointed to jobs should be available to staff the necessary agencies. The Army-Navy Munitions Board has got to be strengthened in a way that it never has been strengthened before. It is essential to professionalize some elements of the staff work of the Army and Navy.

I know the difficulty that presents. I know that a fighting officer must be a fighting officer and God forbid that we should take any of the gimp out of any of them. That quality paid off. But we must also have people who understand the kind of jobs that you are going to be called on to do to run a very large part of the economy. You have been doing it now because nobody would do it except somebody in uniform that could be ordered to do it. People kick about being run by people in uniform, but the plain fact is that men in uniform are public slaves more than public servants. They will take low pay and they will take orders to do work that you can't get anybody else to do. You had four Secretaries of State until you got a fellow who was used to being a soldier and who took orders; and even he is a little weary of it now. So it isn't an invasion of power by the military; it's falling back on them because they are the one group of people in the country who have been trained through a sense of national duty not to ask individualistic questions such as "What do I get out of it?" They just try to go on and try to do a job. Thank God there are such people in a democratic society though they take a rough beating in times of peace.

"In times of peace prepare for war." You are going to have to have more expertly trained staff people who spend more time on a job. I welcome the staff colleges for that reason because obviously they are beginning to take this job more seriously all the way round. But you must go farther than that. You really must

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get people who understand these technical and production problems in a way that the Army-Navy Munitions Board *never* understands.

The strategic materials list that we started out the last war with was something somebody ought to be shot for. It was because the poor guys barely could get acquainted with the nature of the problem before they were gone. Here today and gone tomorrow! You can't expect them to learn that sort of job in that way. But somewhere you must have a permanent cadre of people under your control, as military people, who do understand these problems and who can get in and protect themselves from being kicked around by "experts" and so-called "industrialists" or "specialists". I think you had better take that seriously.

Need for More Specialization on Career Staff Work.

With regard to the specialization of staff work, I don't offer the German G. H. Q. as a model, but it did have certain real advantages. The amount of time spent in staff work, comparatively speaking, by application to it as a career, may have something to be said for it at times like this. The functional development of our society is one in which I'm afraid we don't have the liberty of all being amateurs at everything, and you must know your stuff in these things in order to deal with the problem realistically. The training of your people in industry would be an admirable thing. I know that is being done somewhat, but it ought to be done more.

Fortunately in this country we can count on patriotism in war, which does mean that a democracy fights a war pretty well, I think, on the test.

We didn't do badly last time. We didn't have to deal with any real fifth column or serious sabotage, which we inevitably will

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in this war. The screening of personnel in war plants today is a serious business! You know the Russians are planting men and women throughout our whole system—often carefully cut off from Red contacts, and we aren't taking that at all seriously enough. We would have to go into the next show with the certainty that we were riddled with enemy agents, and we would have to take very stupid measures, probably wholesale measures of cleaning up everybody who was thought to be a communist or associated with them, very unjust measures, because we had failed to take the adequate measures in time.

Now democracy has to depend on a great many things that it is very difficult for a democracy to produce, but it does have the amazing strength that every man is able, in some measure, to continue to press for the thing he believes in, even if he's in a uniform. He is less free there, we know that. But in the course of analyzing your problems, if you can set them in some such light as the one I have been talking about, at least I beg you to take into consideration some of the measures that have occurred to me this morning to be real problems for war planning. To solve them demands a level of devotion and intelligence and being above ourselves, all of us in the future to meet the challenge that we are faced with in our world for the leadership of the world. Dare I use the word "nobility" of spirit? I do. That is what we Americans must develop and there is no place more fitting for it than in the Armed Services which are going to have to bear the brunt of it and which have had that tradition, thank God, throughout our history.