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FOREWORD

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Issued Monthly By
The Department of Correspondence Courses
U. S. Naval War College
Newport, R. I.
STRATEGIC EMPLOYMENT OF THE NAVY; PAST, PRESENT AND FUTURE

An address delivered by
Vice Admiral Donald B. Beary, U.S.N.
at the National War College
16 February, 1950

General Bull and Officers of the National War College, I consider it a distinct honor to be invited to address such a highly selected group of officers. I must admit, however, that I was somewhat confounded when I received the suggested topic for my remarks, which was "Strategic Employment of the Navy; Past, Present and Future". We have in our library many thousands of volumes covering the subject and to think that I could summarize them in a fifty minute talk is somewhat overcoming. However, I will try to give some of the most important points, generally confining my remarks to World Wars I and II and future employment of the Navy.

The basic fundamental mission of the Navy in the past and it will continue to be so in the future is to gain and maintain control of the sea lanes vital to our war effort and to deny to the enemy the sea lanes vital to him.

By April 6, 1917, when we entered World War I, the British Navy had contained, though not destroyed, the German surface Navy, and our contribution to this containment was the sending of the 6th Battleship Division to augment the British fleet. Our principal effort was expended in combating the enemy submarines. You all know the outcome. As far as the Navy was concerned, the war was between surface and sub-surface craft. Shipborne air did not enter into it.
During the period from the end of the war until 1933 we witnessed the rapid disintegration of our navy through armament limitation agreements and drastic curtailment of funds. Ship construction practically ceased; research and development were seriously curtailed and non-existent in that most important development which, though hampered by limited funds, made progress, and in March 1922 we had our first aircraft carrier, the converted collier, LANGLEY.

The period from 1933 to 1941, when we suddenly found ourselves in a war on two fronts, witnessed the slow but gradual build-up of our navy, including destroyers, cruisers, battleships and carriers. The tempo increased with the rapid deterioration of the world international situation until the Japs bombed Pearl Harbor, when the sky was the limit.

Though the Navy suffered terrific losses at Pearl Harbor, we were lucky in one respect and that was that not one of the seven aircraft carriers in commission was damaged. We had been knocked to our knees but were not out.

Our basic military strategy as approved by the President was that initially our major military effort would be made in the European theater, while holding or defensive operations were conducted in the Pacific. We had lost control of the seas. Our Navy had been so seriously crippled and was so definitely inferior in power to the Jap Navy that there was no other answer. Therefore, until the Navy could accomplish its mission of regaining and maintaining the control of the sea lanes essential to the conduct of the war we had to assume a defensive position.

As in World War I by the time we entered the war the British Fleet had contained the German surface Navy, which required an all out effort on its part; therefore the Japanese Navy
became our sole responsibility and we were not in a position to meet it head on. The best we could do was to conduct a few raids, hit and run operations.

However, the extremely rapid advance of the Japs southward through New Guinea and the Solomon Islands, which vitally threatened our line of communications with Australia, forced us to do something drastic to stop them.

This something was the Battle of the Coral Seas on the 7th of May, 1942, followed by the Battle of Midway on June 4th, 1942. We sustained losses in these two battles but the enemy was so severely punished that her great superiority was reduced almost to equality with us. Our strength was growing rapidly. New construction and trained personnel to man our ships and planes were being produced at a rate the enemy could not equal. We were on our way to gaining control of the seas.

On August 7, 1942, we landed on Guadalcanal and, though the fighting was bitter and we took heavy losses, we stuck. The southward movement of the Japs was stopped, and we were now in a position to start the long drive to Tokyo.

The grand strategy for this campaign consisted of two major efforts: 1st, a drive northward under command of General MacArthur, through New Guinea to the Philippines; and 2nd, a drive westward under Admiral Nimitz to Okinawa. After these preliminary objectives were seized and consolidated they were to be the jumping off places for the final assault on Japan. Fortunately, after we had seized them the Japanese sued for peace on August 15, 1945, and the final step, the invasion of Japan, was not necessary.
The above plan of campaign required the use of amphibious operations on a scale never attempted before. The prerequisite for success of these operations was control of the vital sea lanes, including control of the air over them. It required the accomplishment of something which many people said could not be done and that was that ship-based air power could not successfully combat and neutralize shore-based air power. The Navy did it.

So much for the first part of the Navy's mission, that is, the gaining of control of the sea lanes vital to our efforts. How about the second part, that is, denying to the enemy the sea lanes vital to him?

From December 7, 1941, until the end of the war our submarines did an outstanding job and accounted for the major effort in this regard assisted by occasional air and surface raids. With our seizure of the Philippines and Okinawa the long essential life line of the Japanese to Malaya and Indonesia was cut and the Japanese had lost the war through inability to support her military forces and feed her people.

They started the war with about 7,000,000 tons of merchant shipping. They captured and built about 3,000,000 tons during the war, which gave them a total of about 10,000,000 tons. At war's end they had only about 1,500,000 tons left and only 750,000 tons of this was operable. There were only about 500,000 barrels of fuel oil left in all Japan, so you can readily see how effectively we had cut their vital sea lanes. As a matter of comparison our fast carrier task force used as much as 140,000 barrels of fuel oil per day. In other words, the Japanese had only three days supply of oil left on VJ day based on our consumption rate.

This forcibly demonstrates that a nation's sea power is composed not only of her combatant ship strength but of equal im-
importance is her merchant shipping. This fact is frequently dis-regarded.

So much for our naval strategy during World War II in the Pacific. Turning to the Atlantic, as I have said before, the British had contained, though not destroyed, the German surface Navy by the time we entered the war. The fight in that theatre was against their submarines. It was a tough battle and at one time was almost lost, but with the great improvement in detection devices, the tremendous increase in the numbers of escort vessels, the introduction of "Hunter-Killer" tactics and more effective use of land-based air, we, the British and ourselves, were able to successfully combat the German submarines and maintain control of the seas.

The lesson we have learned from two world wars is that the submarine is a most important threat to our control of the seas, and that the introduction of faster under-water speeds and ability to run submerged for long periods of time have greatly increased the difficulties of successfully combating them. In my opinion it is the most important problem that confronts the Navy. It is one which must be solved and will require all the brains, talent and money we can get to solve it. I will refer to this later.

So much for the strategy and mission of the Navy during the past two great wars. What about the future employment of our Navy?

There is a vociferous, fanatical group of people in this country, who unfortunately receive more attention than their cause deserves, who say that air power has sunk the Navy and ships that sail on the surface of the seas. This is not true and all history refutes it. Some of these same fanatics say, "We don't care anything about history; we make it." I cannot believe that any sound,
logical, sane, educated person would make such a statement or believe such a thing.

All progress that man has made in whatever form of science, engineering, art, living, government, etc., is a direct result of past trials and errors and successes. Naval science is no exception. The wise man learns and profits from the past and applies his knowledge to the present and the future.

The end of World War II brought about a situation in naval affairs that had its most recent parallel during the Napoleonic Wars. At that time Napoleon had organized the States of Western Europe into a continental alliance that was opposed by a single dominant sea power—Great Britain. After the defeat of the Combined Fleet at Trafalgar, Europe faced a long period during which the naval strength of the continental powers could be employed only in the "guerre de course"—war upon commerce. The "guerre de course" is the classic weapon of the weaker sea power, but it will not win wars. After Trafalgar, England bottled up what was left of the French Fleet in its home ports by means of blockade, and her sea power was opposed only by such scattered forces as were able to skirt the blockade and prey on British merchant shipping. Thus, absolute sea power, in a manner of speaking, was opposed to absolute land power. But the dominant sea power was without the physical means to settle the issue on the continent; she lacked the resources in men and material necessary to prosecute land warfare on a large scale. And her continental adversary could not bring to bear against her its vast resources in land strength so long as it lacked sea power.

Thereafter, Great Britain recognized it as her cardinal policy to prevent the rise on the continent of a single dominant power that might some day utilize the far greater resources of Europe to outbuild her at sea. Britain steadfastly pursued this policy
right up until World War II, employing the weight of her influence and the pressure of her sea power to intervene in Europe and so preserve the balance of power on the Continent.

Today, the cycle has reached full turn. A single continental power has arisen in Europe that threatens to exclude the Western democracies from the Eurasian Continent. That power is opposed by a complex of States that rim the Atlantic Ocean. The backbone of that complex is the sea power of Great Britain and the United States, upon which all the rest depends. Except for its submarine arm—of which more later—the naval strength of the continental power is not great enough to make a serious bid for command of the seas.

This state of affairs has created in the minds of many persons a dangerous misconception—some of whom, indeed, may be responsible for the formulation of our national strategy. That misconception is that sea power cannot be fully effective unless it is opposed by sea power, weapon for weapon. The belief is widely held that if the Soviets do not have capital ships, then we do not need them; if they lack the striking power of carrier air, then this weapon has no place in our arsenal; and that it is sufficient simply to counter our opponent where he can strike us at sea, namely, by defeating his submarine fleet.

I assure you, gentlemen, nothing could be farther from the truth.

As I have said before, the Mission of the Navy in war can be reduced to a very plain statement: to make safe for our use the sea lanes we need and to deny to the enemy the sea lanes he must use to fight the war against us. Out of this simple Mission grows a multitude of tasks that require the use of many weapons. It will be my purpose here to state those tasks to you and to demonstrate
how the Navy can—and, I trust, will—carry out those tasks if another war is forced upon us.

It is helpful, I think, when reviewing our overall strategic situation, to hold in mind a polar projection of the northern hemisphere centered somewhere near Moscow. The European peninsula is adjacent on the north, west, and south to waters of the Atlantic, or waters tributary to it. To the southward of the Eurasian land mass, the Persian Gulf knifes in from the Indian Ocean to a point within a thousand air miles of Soviet industrial centers in the Caucasus and on the Caspian Sea. To the east, Siberia and China front the Pacific Ocean. Wherever the coasts of Europe and Asia meet the sea, Soviet power stops and ours begins. Thanks to Anglo-American sea-air power, the broad surface of the seas is denied to the enemy and is open to our use so long as we are able to defend our shipping from the enemy’s submarines and his land-based air.

At the present time, as you well know, we hold important strategic positions around the Eurasian continent from which our military strength could be projected against the Soviet Union. At the outset of any war, we shall hold an important lodgment in Western Europe. Whether we can successfully maintain a foothold on the continent of Europe against the full weight of Soviet land power must, of course, be determined by the event. We believe that we can do so; and we are making heavy investments in the Atlantic Pact nations to make that expectation a reality. Outside the continental limits of Europe and Asia, we are established in the British Isles, in other islands of the Atlantic, in north and east Africa, and at scattered points along the fringes of central and southeast Asia. We face the Soviets in eastern Asia and in the Japanese Islands and Okinawa.
Thus, the entire Eurasian land mass is ringed by a series of positions from which heavy blows could be directed anywhere against objectives on the Continent. In this situation there is demonstrated the classic weakness of a strong land power opposed by a sea power having limited land strength. The land power cannot invade the territory of its opponent since it cannot transport its ground forces overseas. Although it may strike its enemy through the air, and indeed deal him fearsome blows, it cannot make their final by the ultimate invasion of his homeland. When ranged against a strong sea power, the land power can gain at the most only a stalemate. With this it must be content, since the oceans remain an effective barrier against the movement of troops in great force.

Not so, the sea power. The flexibility of action that is afforded by control of the seas permits the sea power to deliver its main thrust—or a series of thrusts—from any direction. The enemy cannot be strong everywhere, and he cannot know for certain from whence the blow may fall. By the economy of the limited force that is available to it, the power that commands the sea can direct that force so as to obtain its maximum effect.

These principles apply whether the force used be strictly carrier strikes on coastal objectives, long-range strategic air attacks from peripheral bases, or amphibious invasion. Although the continental power retains the advantage of interior lines, they may prove of little value if its forces are over-extended and cannot be transported in time to meet the threatened attack.

It would seem, therefore, that our basic strategy, in the case of a war against the Soviets, would be to preserve the sort of a condition I have just described. If we are ultimately to intervene with ground troops on the continent of Europe—and it appears inevitable that we would have to do so—then such an interven-
tion should be made only after the enemy has been seriously weakened by blows delivered with sea and air weapons from peripheral bases.

It would be unwise to the point of folly, however, to assume that such a strategy is not apparent to our opponent or that he will not do everything in his power to nullify it, if and when he decides upon war. Having recognized that strategic air attacks may be carried out from advanced Allied positions against his industry and communications, it may well be that the enemy's first move in the event of war will be to capture or neutralize these positions.

This, he has the capability of doing. True enough, the Soviets could neither hold nor support overseas positions in the face of the pressure we could ultimately bring against their communications, but, for a time, an initial move of this sort might have desirable effects. Such an opening move could conceivably take the form of an atomic blitz against Britain, coupled with airborne and air-supported attacks on Iceland and our North African positions. In such a case, the effect of any planned retaliatory blow would be seriously reduced. We would be forced to rely on North American bases and such advanced bases as we might continue to hold for the support of an initial strategic bomber offensive. Thereafter, we would be faced with a long, uphill pull to re-establish our forces at locations close enough to enemy targets to make the employment of our air power both effective and profitable.

It will be clearly apparent to you that the support and retention of overseas bases will depend upon the ability of the fleet to keep open the lines of communications with those bases. The enemy will have at his disposal two primary weapons to prevent our doing so. One of these is the submarine; the other is land-based
air, where it can be brought within range of the sea routes our ships must use.

As to the submarine, it is gratifying to observe the attention that is now being given to that problem and to note the agreement so widely reached that we must make a major effort toward its solution. Although I am unable to say to you that any final solution is as yet in sight, the means of detection and the weapons for use against the submarine are well in advance of those available at the end of the last war.

There is a tendency, I fear, on the part of the public—and some members of the military—to over-emphasize the potentialities of the submarine and to overlook some basic disadvantages attendant on its use as a primary weapon in the war at sea.

The submarine is, fundamentally, a weapon of the "guerre de course". Commerce raiding has held a fascination for weaker naval powers throughout the history of naval warfare because of its cheapness. But it has never decided the issue in a major war. The British tried it themselves in the Anglo-Dutch War, when Charles II sought to gain a cheap victory over the Dutch and their French allies by preying on their commerce. This war ended, however, with a fleet of Dutch ships in the mouth of the Thames. During the war of the Spanish succession, the French devoted all their efforts at sea to the raiding of British commerce. Although the British lost hundreds of ships, their trade increased nevertheless, and French shipping all but disappeared from the seas. Mahan roundly condemned commerce raiding as a poor substitute for fleet action. His studious disciples, the Germans, placed primary reliance upon it as a means of naval warfare in both World Wars.

Today, we have not yet found completely satisfactory methods of combating the most advanced types of submarines. But it
is by no means clear that the Soviets will be able to employ them effectively against the opposition that even now we are able to offer.

The task of the submarines has been greatly complicated by new developments. As you know, the Germans found it necessary to give their submarine crews long and intensive training periods in the Baltic in order to fit them for warfare against our convoys in the Atlantic. The shortening of their training periods, enforced upon the Germans during the latter stages of the war, was a great source of apprehension to Admiral Doenitz. The submarine that we shall combat in the next war will require of its crews even greater technical proficiency than was attained by our recent enemies in the last. Whether or not they are capable of attaining this skill only time will tell. We should not discount it too much.

So far, we have developed no acceptable substitute for the convoy nor for the “hunter-killer” tactics so effectively employed toward the end of the last war. We have, however, improved both our weapons and our techniques in the prosecution of these methods of anti-submarine defense. And other methods now under research and development give even greater promise of a final answer to the submarine problem.

But convoy and passive protection of shipping alone is not enough. In the first instance, it surrenders to the enemy the initiative and leaves him free to devise new methods of attack when old ones have failed. In the second, it forces upon us the need to provide shipping with greater and greater protection as enemy offensive measures become more effective. And, finally, it permits the enemy to increase the size of his concentrations against us, since passive defense has no effect on his ability to build more submarines.
Therefore, as a corollary to convoy and "hunter-killer" cover, we must take up the offensive against enemy submarines before they leave their ports. We have numerous means of doing this. Many of them lie within the sphere of strategic bombing—particularly those that embrace attacks on building and assembly yards. But as the finished product nears the sea—when the fitting out and training stage commences—then, it may be within the power of the fleet to intervene.

We shall seek to prevent the enemy from testing his boats and training his crews in sea areas that are adjacent to the oceans. We shall mine his harbors and their exits, both by aerial and submarine laid mines. And we shall attack him from the air while his undersea craft are still in their pens. All of these are measures that not only may require the mobility and striking power of shipborne air, but are measures also to which it is especially adapted. It would, of course, be a mistaken and uneconomical use of sea-air power to carry out an offensive of this nature where enemy training areas, harbors, and bases are within the effective cover of land-based air. But in regions inaccessible to land-based aircraft capable of precision attack missions of this kind, aircraft from carriers may well be the only weapon that can do the job.

As to the enemy's land-based air, we can expect it will be employed against our merchantmen much the same as it was in the last war. The Germans used long-range reconnaissance aircraft to locate convoys at sea. When a convoy was found, the position would be relayed by radio to submarines best disposed to attack. Thus, it would seem that some form of aerial reconnaissance will be necessary if Soviet submarines are to be employed advantageously. This means we shall have to screen our convoys against being scouted by the enemy's land-based air. It will not be an easy job to do. Limited, close-in screening can be carried out from escort
carriers, but, in view of the enemy's ability to install radar in his scouting aircraft, it is highly doubtful if we will be able to conceal the location of our convoys.

An obvious alternative would be to destroy the enemy's reconnaissance aircraft at its coastal bases. In some instances, it should be possible to do this by land-based air strikes, provided their are friendly fields within range. Elsewhere, fast carrier task force strikes will be the only means of getting at these aircraft. On the whole, the maintenance of absolute control of the air above convoy routes will be a difficult task to accomplish because of the inordinate effort required to screen shipping against long-range reconnaissance aircraft. It should be possible, however, to defend merchant convoys against direct attack by land-based planes by the provision of escort carriers in waters where danger of enemy air attack exists. In the narrow seas, within close range of enemy air bases, heavy covering forces consisting of carriers and gunfire ships will doubtless be required to fight the convoys through. Our experience in the Mediterranean during the last war indicates, however, that merchant convoys can be moved in the presence of strong land-based air, provided carrier-borne aircraft is supplied in adequate strength.

This leads us to a consideration of the carrier task force as the primary weapon of naval warfare. As you know, the fleet actions of Midway and the Coral Sea marked the beginning of a new era in naval warfare and confirmed the aircraft carrier as the real capital ship of the future. It is the most powerful offensive weapon we have. The big-gun ship has now assumed primarily the status of a surface escort for the carrier, although it has other uses. As the war in the Pacific progressed, the striking power of carrier aircraft against objectives other than enemy fleets was forcibly demonstrated. Indeed, so effective did carriers prove in securing
local control of the air at heavily defended land targets that surface operations until then conceived as impracticable were confidently planned and successfully carried out.

The aircraft carrier derives its value from a number of tactical qualities, but it possesses one feature that transcends all the others: It is a mobile base that can be brought close enough to enemy targets to launch aircraft with their optimum fighting capabilities unimpaired. Of course, the fact that carriers may be concentrated, and thus multiply their effectiveness; that they may be employed with surprise; that they may cruise for long periods in distant waters; and that they have great flexibility as to the targets against which they may be employed; all these, too, are important. But the ability to operate aircraft at short ranges—which the carrier imparts—is the unique feature that is unmatched in any other weapon of aerial warfare. The carrier sends up an aircraft with a minimum fuel load compared to that of land planes that must be launched from more distant bases. Hence, it can devote a greater portion of its carrying capacity to offensive and defensive weapons, and it can be employed with greater frequency since it has a shorter distance to fly. These advantages combine to increase the striking power of carrier aircraft, not directly with the decrease in range to the target, but more on the order of a geometrical proportion with the decrease in range.

All of these tactical features add up to provide for Allied sea-air power a strategic advantage that cannot be offset by its opponent. By means of air-sea task forces employed in adequate strength, we should be able to overwhelm the enemy at any point within reach of our carrier-borne aircraft. It is this ability that has in the past permitted us to paralyze enemy defenses at the end of a long overseas movement of amphibious forces. It is this ability which, I trust, will in the future permit the support
and retention of overseas positions we may need to drive the war home to the enemy.

I think we may accept it as a sound military principle that when one component of the nation's armed force has been assigned a specific task, it should be free to investigate the nature of that task against the background of its own peculiar talents and experience. Only by this means will it be able competently to determine how best to do the job it has been given.

Now, the Navy has been allocated those tasks that require the use of weapons peculiar to sea-air power. Nobody disputes that. These tasks do not involve the direct participation of any other service. One of them is to employ the striking power of carrier-based air against certain enemy targets that can be reached from the sea. Accordingly, the Navy has put its best brains and its most experienced officers to work on the problem of how most effectively to employ carrier-based air against the opposition we may expect in the future. This is a technical problem that requires solution by persons who are by training and experience intimately acquainted with all the factors involved. I think you will agree that such knowledge and experience can best be obtained from within the Navy itself.

Briefly stated, it has been the result of the Navy's investigation of this problem that we cannot expect to overcome determined opposition at all enemy targets that are vulnerable to sea-air attack unless we employ the most advanced types of aircraft that are available to us. We are aware of developments in Soviet aviation and along other lines of anti-aircraft defense. There can be no doubt these measures would have a high degree of effectiveness against the aircraft for which our present carriers were built.
But we, too, have made corresponding advances in the art of aircraft design and construction. We can build planes today that we believe will out-perform anything the Soviets will have in the foreseeable future. These are the planes we will need if we are successfully to exploit the unique weapon of sea-air power.

Unfortunately, we cannot adapt our present-day carriers—which, as you know, were designed under conditions of the last war—to the new high-performance aircraft without sacrificing some of their most valuable performance qualities. The Navy should be free to build the carriers it needs to carry and operate the planes necessary for it to carry out its mission.

We must, I feel, remain keenly alert to changing tactical and technological conditions that dictate changes in strategic concepts. Hardly a month passed during the last war but what some naval development, however minor, contributed its small influence to large revisions in our strategic thinking.

One of the most significant of these developments was the operation of carrier task forces relatively independent of forward bases. In past wars, the radius of action of naval forces was determined by the availability of bases—or at least of coaling stations—in advanced areas where the fleet sought to operate. Bases have traditionally been one of the essential components since fleets acquired freedom of mobility with the advent of steam. The sea power of Great Britain was magnified and reinforced by her numerous naval stations in all the oceans of the world. These bases made it possible for Britain to extend the range of her fleets; and they, in turn, depended on the Fleet for security and protection against overseas attack. Until World War II, it was accepted as axiomatic by naval strategists that no nation could aspire to control of sea areas far distant from the homeland unless she had access to bases in waters where the fleet was to be employed.
Today, that is changed. In World War II, we were faced with a situation in the Pacific that threatened severely to limit the striking power of the naval weapon. We lacked bases in waters where we had to carry the fight to the enemy. So we made our bases mobile, and we took them where we pleased. As a result, our fleets are today virtually independent of overseas bases. The flexibility of the sea-air weapon has been multiplied, and for limited periods we are able to bring to bear the full striking power of the Fleet in waters wherever ships can sail.

The strategic implications of this naval development I am sure are not lost on you. What we are now able to do is to bring to bear the full strength of our sea-air power where and when we wish and to maintain the pressure for prolonged periods of time.

Of course, advanced bases still are of great value. They serve two main purposes. First, we need locations in forward areas where we can send ships for repair of battle damage that would otherwise require a long trip to shipyards in the rear, and we need them also to patch up heavily damaged ships so that the voyage home may be made in safety. Secondly, we need advanced ports where stores and ammunition can be transferred from incoming cargo ships to the specially constructed logistics ships that work in the fleet. But neither of these functions requires an establishment on shore. The facilities needed for the operation of an advanced base, including major ship repair, may be entirely waterborne. Thus, any protected anchorage favorably situated with respect to the zone of combat may be placed into use as a floating base just as soon as the specialized logistics ships can be brought forward.

Now, before closing, I want to touch briefly on the atomic bomb and what it means to the future of naval warfare. I think it is safe to say that nuclear fission has had an impact on existing theories of warfare more severe than any other new weapon in his-
tory. It has radically disturbed our pre-conceived notions involving the disposition of forces and the principles of concentration and mass. Paradoxically enough, we, who first developed the bomb, have suffered most by the upsets it has produced in the technique of warfare.

Our military experience in World War II was gained at enormous cost. In the field of naval warfare, we battled our way slowly and painfully from Pearl Harbor to Okinawa, meanwhile gaining a "know-how" in the use of naval weapons that is unmatched by any nation in the world. But at the very end of the war a new, more powerful weapon appeared that now threatens to undo much of what we have learned.

The influence atomic weapons will have on maritime strategy, however, is not yet clearly defined. For the present, we must adjust ourselves to this situation just as we have in the past, when new means of attack have seemed to render obsolete ships and weapons then in use. Naval history is replete with instances where some new weapon has threatened to make the ship no longer an effective instrument for controlling the seas. When the explosive shell supplanted a solid shot for use against the wooden man-of-war, pessimistic observers were convinced great ships could never stand up against this terrible new weapon. But shortly afterward, the ironclad ship made its appearance; and sea control continued to be exercised, as usual, by the Power having the largest fleet of heavy ships. When the Whitehead torpedo was introduced, it seemed evident the death of the capital ship was at hand. So convinced were the French of this fact that they temporarily gave up the building of large ships in favor of small torpedo boats, each able to launch a lethal attack upon a battleship. But it turned out that these small craft could reach their targets only under favorable conditions of sea and weather, and
that they were highly vulnerable to the defensive fire of their ponderous opponents. Moreover, improvements in underwater protection tended to redress the balance in favor of the ship. With the advent of the airplane, it appeared certain to most advocates of air power that large ships would become easy prey to aircraft able to launch against them bombs weighing five hundred or a thousand pounds. Instead, the present day capital ship—with its powerful anti-aircraft weapons, under radar control and firing influence-fuzed shells augmented by its own air coverage—has become an extremely tough target, even to large flights of aircraft.

And so it goes. I think the lesson to be learned here was best expressed by Mahan when he cautioned against being too quick in discarding the old as well as too slow in adopting the new.

We know, of course, that a single atomic bomb will destroy a single ship. But we know also that fighting ships underway and suitably dispersed will suffer but slightly from an atomic explosion, except by direct hit. This would seem to make the use of atomic bombs against mobile forces extremely doubtful.

On the other hand, heavy concentration of ships in ports or amphibious operations might offer suitable and worthwhile targets. The present answer seems to be greater dispersion and control of the air over the vital areas. It is not beyond reason that we shall in the future evolve a defense against the atomic bomb that will prove effective.

Now as to push button warfare, including rockets, jet propelled bombs, guided missiles, etc., fortunately, the solution of that problem seems very remote. At best they probably will never be precision weapons and whether or not they will be used against mobile naval forces is problematical. As you know, counter measures
are being devised but have not yet been overly successful. It is a problem which is of vital importance to all the armed services.

In conclusion, gentlemen, if there is one single thought I should like to leave with you, it is this: Command of the sea is vital to us in war. I think that summarizes all I have had to say. Unless we have command of the sea, our war-making force must remain based within our continental borders. Without it, we cannot support our allies, and we shall be left to face the enemy alone.

It is the job of the Navy to provide that command. The Navy by itself cannot win a war. But the Navy alone can create conditions without which victory cannot be possible. Those conditions are these: to make safe for our use the sea lanes we need and to deny to the enemy the sea lanes he must use to fight the war against us.
CAPABILITIES OF THE ATOMIC BOMB, INCLUDING NAVAL THINKING ON ITS EMPLOYMENT

Extracts from a Lecture by
Rear Admiral W. S. Parsons, U.S.N.
at the Naval War College
February 16, 1950

My lecture is supposed to be about naval thinking on the employment of the atomic bomb. I find difficulty in separating naval thinking from military thinking and national thinking in this case. I don't think that you can draw any sharp or beneficial distinction between them. They necessarily interact on each other and are included under this heading of national thinking.

It is necessary even to go into what we mean by thinking itself. I have been impressed by the type of thinking which has gone on since 1945. I've followed it rather carefully, and I have been affected by it. I think the term "visceral thinking" applies to quite a lot that has been done since 1945. There are inarticulate visceral thinkers, who take a set of facts and draw some most remarkable conclusions from them. The inarticulate visceral thinkers are of the type who do not pay much attention to newspapers and radio programs. They are almost impervious to what we call propaganda. They are also inarticulate because they don't read much and certainly wouldn't think of writing very much. Those people take a set of bare facts such as these: "We had to land in Normandy; we had done a lot of bombing; in spite of that we had to march through on the ground. But when we dropped two atomic bombs on Japan they surrendered." That's all they think

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of, and then don't analyze it at all. That, I think, is behind a great
deal of the terrific worry and pressure which has prodded and
harassed the Atomic Energy Commission and has maintained the
atomic energy program. That is plain reflex-deduction from a set
of facts without any critical appraisal of those facts, what went be­
hind them, or anything else. Their conclusions are drawn: "A sur­
render of Japan occurred after two atomic bombs were dropped. A
surrender did not occur in Europe because atomic bombs were not
used."

The articulate thinkers, including some atomic scientists for
the first several years during the pre-Blackett era of articulate
thinkers, created the concept of the "absolute weapon." They
were using "visceral thinking" but they were rationalizing and
dressing it up in very impressive language. That concept of the
"absolute weapon" was still obtaining in full force when I spoke here
in September, 1948. I found it necessary to go into it, to go into its
expression, its impact on concepts which were being reported as
war plans, and I had to work it over rather thoroughly. Then within
three weeks, Dr. Blackett's book came out. The British edition
that came out first, was called "Military and Political Consequences
of Atomic Energy." The American edition was titled "Fear,
War and the Bomb." The book is a most remarkable analysis. I
would say it is by far the best presentation in English, of the
Russian point of view. It really sharpened the issues in this case
and it was a terrific shock to many of our highest-powered scientists
who had been associated with radar, atomic-energy development,
proximity fuse development, and had seen their work bear fruit in
important military consequences during the war. Dr. Blackett had
received the American Medal for Merit for his very fine work in
anti-submarine operations analysis during the war. He was given
similar decorations in England, I believe. As his book was pub-
lished he also received the Nobel Prize for his work, beginning in the early twenties, in nuclear physics. Doctor Blackett had been an officer in the Royal Navy during World War I. He had then gone into physics. He had about the best mental equipment for operations analysis and scientific military appraisal of any scientist of his time. That was quite a shock, as I say, to our scientists who had thought that their analyses of military consequences and military tactics should be absolutely sound because they had used scientific methods in producing them. This was a demonstration, by one of the best equipped, best thinkers among physicists and scientists in general, that you could take a set of facts, that you could handle them in apparently scientific fashion and you could prove practically anything that your apparent religion and philosophy demanded to be proved, and do it, not in Russia, but right in England, using the accepted terminologies and accepted operations research methods.

It was a terrible blow to our Operations Analysts and other scientists in the United States to have one of their most eminent members write this book. That was independent of the impact of the book itself. I have just given the impact on the scientists. The book probably had a beneficial effect in many ways, because it sharpened the issues and caused people to re-examine the facts to see how Blackett could be combatted. That was the beginning of a new era in the articulate arguments on atomic energy and its military consequences.

That illustrates to me a very necessary thing in working over facts, particularly intelligence observations and in thinking of what Russia, for instance, can do under certain conditions. To go back to Ptolemy and Copernicus, you can say that imagining the sun and the stars as revolving around the earth because it “looked that way” was an example of “visceral thinking” which was dignified by some of the best so-called scientists for hundreds of years. The
accurate, correct interpretation had to be fought over for just that length of time before people would actually look at this set of facts and derive the correct conclusion from them.

I will now mention another recent shock. We operated under a semi-dictatorship in World War Two. We had absolute priority of effort, and we got results like the Manhattan District, production of aircraft and production of fleets. We then demobilized and concentrated on automobiles, television and like things. But we forgot that Russia had not demobilized and was still operating under a dictatorship more rigid and perhaps as dynamic as the one that we had operated under in World War Two. We did not take account of certain little red flags that were flying. I'm leading up to this shock that we experienced when the announcement came out on the 23rd of September about a Russian atomic explosion. We were quite shocked. But if we had thought of certain things which had occurred, such as the obvious flying around of wing jet fighters and many copies of our B-29, when we knew how hard it had been for us to put anything like that number into the air, we would have been less shocked. Those red flags indicated that regardless of how inefficiently rail transportation and various other routine operations were carried out in Russia, when they assigned top priority to a job, it really rolled. That made it not too much of a shock to some of us who had been observing those red flags flying. But indicates the kind of trap into which we can fall when we sit in one type of organization, one type of climate, one type of pressure and try to estimate what someone else is going to do, living under a completely different system with different motivations.

That leads me into one or two final points. I was very much impressed with the talk General Marshall gave this week at the National War College. I'll mention just one of his points.
He was commenting on the old Army War College, but I think his remarks applied to war colleges in general. He said that it is very necessary to be as concrete as possible in plans and to get away as far as we can from purely abstract statements. He warned that the difficulties we had had with Army War College Command and Staff schools and staff people, were their tendency to deal in the abstract rather than the concrete. He gave an illustration occurring at an early peak of activity, say in 1939, '40 and '41, when he, as Chief of Staff, and as Deputy Chief of Staff before that, was facing concrete problems not very far away from the Army War College. They were taking it very easy with their two-week maneuver, or whatever it was called. He said that he would like to expose them to some of the real facts of life, and the way it would occur would be this: They would be given two-thirds of the necessary information for working out a problem on Saturday noon; they would work over the week-end at highest pressure on those two-thirds of the problem; on Monday, they would be given the missing third which showed that they would have to throw all their work over the week-end into the waste-basket; on Tuesday the rules would be changed, and on Thursday the whole solution would be thrown out.

Citing the need for realism and concreteness does not imply ability to predict events. Dr. Isaiah Bowman, retiring president of Johns Hopkins made a pertinent comment when we asked him how he had made such very good predictions of events to come. In the last fifteen years, he has been credited with having hit the nail on the head with many of them. In denying this ability he said, "I don't think that it is possible for anyone to predict in detail what will happen. The actual event depends too much on pure accident and the personalities of people involved."
The problem of predicting military and political trends may be compared with weather prediction. You take the distribution of energy throughout the atmosphere; barometric pressure, temperature, etc. If it is evenly distributed and the atmosphere is fairly placid, not much is going to happen, and you are not too interested in that particular situation. But as you get pressure gradients, which means momentum of the air masses the dynamic trends appear. It is certainly possible to make general predictions, but not detailed predictions as to what will happen in any given locality. Similarly, it has been possible to detect human and power pressure gradients and to imagine them as they appear on a weather chart. Then the general predictions can be made. The general precautions can be taken, but in detail you can’t do it. If we look back over the week before Pearl Harbor we can, I believe, see that in almost any way that the game might have been played, it should not have turned out the way it did. But it is impossible to make a detailed prediction of that type without tactical intelligence which itself would change events.

Finally I would say that while the splitting of the atom has been credited with causing all of our headaches, I don’t agree. We are turning the pages of history. We cannot turn them back and we cannot seal the next chapter. The facts of physics, the subtle threats of chemical warfare, of bacteriological warfare, and of radiological warfare without bombs, may be ominous. They are all from inanimate matter. A threat of atomic bomb is, as I said first, very non-subtle and very violent. Therefore, since it is spectacular, it is very convenient to lay the sins of mankind upon the uncontrolled atom. Some people seem to hate to turn the next page of history. They are afraid to see what they will read in that next page. I don’t think that is sound. I think that the soundest way to express it is that it is not the atom which is out of control or may get out of control, it is the human. However, we can read the
lessons of history, and get some reassurance from them with respect to the probability of the human getting permanently or too tragically out of control.
TRAFFIC MANAGEMENT CONTROL

A lecture delivered by
Rear Admiral George W. Baurenschmidt, U.S.N.
at the Naval War College
February 16, 1950

In the last war production as a problem was solved very early, but the problem of distribution was not solved. Transportation is a major component of distribution. Traffic management is a major component of transportation. My subject today is "Traffic Management." But it cannot be discussed without a discussion first of transportation as it pertains to logistics.

We are accustomed to thinking of war in terms of fighting, but you here at the Logistics Course of the War College must by now recognize that the major part of modern war is logistics, and transportation is a big part of logistics. The statistics of transportation in the Second World War are impressive and colossal. Cargo and passenger ships outnumbered fighting ships many times over. The Army, which depended almost entirely on truck transportation in the European theater, had 30,000 men just operating railroads in that theater. The tonnage hauled away from the United States for the war effort can be represented as half a thousand billion ton miles, while inside the United States the railroads alone in one year hauled three quarters of a thousand billion ton miles. The Navy each day during the war turned over to carriers in the United States an average of 100,000 tons of material. These statistics are not only colossal, they are beyond comprehension just as is the National debt, which, in no small part, represents transportation costs. I cannot stress too much the point that in modern war, transportation is a factor to be given ever greater

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consideration for its importance; cost, and effect grow and grow as new techniques of war develop. The soldier of Caesar's Legions furnished his own transportation and lived off the land, but in the intervening 2000 years since the days of these Legions, such things as gun powder, petroleum, feeding habits and spare parts have made transportation a matter of grave concern to the military leader.

Transportation is a chain of many links including the actual media of movement such as trucks, trains, planes and ships, and including terminals, ports, landing fields and storage facilities. In time of war, or any other time of maximum utilization of transportation, all links of this chain must be of equal strength. Thus the capacity of railroad cars serving a port must be matched by port capacity, ship capacity, and finally capacity at the terminal at the other end of the overseas haul. A bottleneck anywhere reduces the efficiency of the whole. The result of imbalance was conspicuous in the First World War when there was an actual backing up of 200,000 loaded freight cars at New York because of insufficient port facilities and vessels capacity. To give you some idea as to what 200,000 freight cars constitute in the way of a block to traffic, they jam the facilities of the railroads from New York all the way back to Pittsburgh. Proper balance between the links of transportation can be maintained in some part by the carrier operators, but by far the greater agent in maintaining this balance is good traffic management.

The Second World War shows that much has been learned from the lessons of the first great war. There were no serious breakdowns in transportation even though imbalances did exist, and to show you that imbalance did exist and in part to indicate how they were taken care of, I can state that Navy material awaiting transportation across the Pacific was backed up for want of
shipping, backed up as far as Illinois, but the effect of this back-up on transportation was kept to a minimum by the expedient of retaining the material in warehouses. In other words whenever it became apparent that the material could not be moved forward beyond a certain point, it was placed in warehouses until it could move forward and so the Navy operated warehouses from San Francisco to Illinois.

Just as there were lessons to be learned from the First World War so are there lessons to be learned from the Second. Two of these are: first, there is a need for more intelligent use of port facilities, and second, there is a need for the use of more ports with less emphasis on the large ports. Under the National Security Resources Board there is an agency studying the Nation's needs for transportation in the next war and the means to best satisfy those needs. This agency, come the next war, will probably be the successor to the Office of Defense Transportation, which operated in the last war. The name of this agency is Office of Transportation and Storage. It is planning port-utilization now and has established rules and an organization, which should do much to promote maximum port utilization. In the last war we shipped most of our cargo through the East Coast ports of New York, Norfolk, Boston and Philadelphia, and through the West Coast ports of San Francisco, San Pedro, Seattle, and Port Hueneme. The disadvantages of this type of operation are self-apparent. First, such concentration of war material and transportation facilities offers excellent targets in the age of atomic warfare. It also narrows the hunting fields of the wolf packs of submarines. Just as important as the first two is the fact that this restrictive use of the Nation's port facilities overtaxes the ones that are used, the railroads that serve them, while leaving comparatively idle many smaller ports and the railroads serving them. It is the Navy's intention, and I have been assured that it is the intention
also of the Army, that the smaller ports shall be used in the next
war and to this end the Navy has planned the establishment of a
substantial number of small supply depots and transit sheds for our
minor ports with supply centers centrally located inland to as-
semble material for them and route it to them.

Let us divide transportation logistics for this study into the
parts of \textit{lift potential} and \textit{lift utilization}. The carrier operator
furnishes the first by providing ships, planes, trucks, railroad cars,
and, in addition, by providing schedules, rates, repairs to his equip-
ment, interchanges with other carriers and other operational
services. The second is the responsibility of the users of the lift
potential. In other words the shipper-receiver. It is he who must
apply to best advantage the highly complicated structure of the
lift potential furnished by the carrier operator. Lift potential
is a field for deep study and constant research by the logistician,
but it can be bypassed this afternoon, for our interest as of the
moment is in the lift utilization, or traffic management.

I have described the structure of the lift potential as high-
ly complicated. It is seldom that we can put a package in a carrier
and have it remain there until it arrives at its final destination. In
the case of railroads, ships and planes the package must usually be
brought to the carrier and hauled away from the carrier, and ex-
cept for whole truckloads even truck cargo must be consolidated.
Add to this the various rates, or tariffs, the multitude of schedules,
and time intervals for transit, the various requirements for pack-
aging, and we begin to see the complications. Good traffic manage-
ment requires a thorough understanding of all that each carrier
operator has to offer. The traffic manager must obviously see to
it that his package is so shipped as to arrive at the intended des-
tination and to arrive there on time and in good condition. He is
also involved in the matter of cost and these must be true costs.
In other words, it is not merely sufficient that he balance the charges of one carrier against those of another but he must also include such items as the cost of packaging required for each mode of travel, and such items as stevedoring. When using premium transportation to achieve speed, he must not only weigh need against cost, but he must provide for, or insure that, his package is transferred to a more reliable but slower means of conveyance whenever the premium type carrier is unable to perform.

The matter of cost of transportation is not the simple one of inquiring of each carrier what he will charge to haul a specific load of freight. The tariff structure is complicated and a rather wide field for negotiation even though rates have been published. The Armed Services have been subjected to a fair amount of criticism because they failed to negotiate in transit rates for tremendous amounts of material moved during the recent war. I can describe an in transit rate somewhat in this fashion. Short hauls cost more per mile than do long ones, but when material is destined to make a long haul, which is interrupted, the carrier may legally charge the short haul rate, but the user may demand and get the long haul rate.

Suppose, for example, Mechanicsburg is shipping engine parts to San Francisco, but these parts should be added to other parts at Clearfield to form full kits. If the Navy claims in transit privileges it may ship the parts to Clearfield where Clearfield works on them for several weeks and then sends them on in kits to San Francisco. The Navy may claim through rates for the parts from Mechanicsburg to Clearfield and for that portion of the shipment from Clearfield to San Francisco which represents the original parts. Involved also in the matter of rates is the commodity classification. Rates have been established for each commodity. It is incumbent upon the shipper to designate his shipment as falling in
that commodity group which is both appropriate and carrying the minimum rate. To illustrate this point, I cite the case of the man who went to the cereal manufacturer and stated that he could save him large sums of money. The manufacturer was skeptical but finally entered into a contract which proved to be lucrative to both the manufacturer and the man. The man's proposal was that the manufacturer stop calling his product the shredded wheat biscuits and merely call it shredded wheat, because under the first name the product took the tariff for bakery products since it was called a biscuit, while under the second name it took the much lower tariff for cereals. The services have been criticized for failing to take advantage during the recent war of in transit privileges and proper commodity classification. It is true that leisurely analysis after the war can show that a billion dollars could have been saved by better traffic management but so can every Monday-morning quarterback prove to you how last Saturday's game could have been better played.

Traffic management has been defined many times. I shall give you a definition which may be over-simplified, but which focuses attention upon its salient features. Traffic management is the science of procuring for the shipper the cheapest possible transportation consistent with delivery requirements in times of peace, and, especially in time of war, securing the greatest and most effective utilization of carrier capacity.

This appears to be the age of centralization in government, and that in spite of the fact that almost a generation ago big business found that over-centralization was costly, and big business has long since decentralized in many areas. We are urged today to centralize under one head all transportation controls in the Navy. Then to centralize under one head all transportation controls for the Army, Navy and the Air Force. And finally, we are told to central-
ize under one head all transportation controls for the Department of Defense and for all other Government departments. And yet during the recent war both the Army and Navy found it necessary to decentralize their transportation controls to agencies in the field. Some concentration is indicated. How much there will be remains to be seen. As of the moment there has been formed a Central Military Land Traffic Office to perform under the administration of the Army certain functions which the Army, Navy and Air Force were mutually agreed could be centrally performed and yet leave to each of the three departments those functions of traffic management which each of the three services at present believe essential to its own adequate operation. Some of these functions are: (a) Negotiation of rates and charges on after-the-fact shipments, (b) Issuance of freight classification guides, (c) Negotiation of rates and average demurrage agreements, (d) Issuance of export release permits under conditions of war or emergency only, (e) Exchange of information as to availability of service-owned equipment to promote maximum use, (f) Operation of freight consolidating and distributing stations if and when established by mutual agreement in times of war or emergency. To the functions assigned to the Central Military Land Traffic Office can be added other functions when the three departments are satisfied that it is appropriate to lodge them there. Should the departments feel that any of the present functions are improperly lodged in that Office, they may be removed and restored to the several departments. So far the operation of this central office appears to be satisfying all three services. Further, it is hoped that by the improvement in their operations the three departments may satisfy the General Services Administration and other agencies of the Government that it will be unnecessary to centralize any traffic management of the three military departments in any other agency of the government. The three military departments are already of the opinion that it would be unwise so to do.
Just as there are some in the government who are clamoring for centralization and more centralization, so are there those who within the Department of Defense advocate that transportation be divided between its three major media and assigned to the three departments. Under this concept the Department of the Army would budget for and operate all land transportation, while the Department of the Navy would budget for and operate all sea transportation, and the Department of the Air Force would perform similar functions for all air transportation. This theory, like many another theory before it, sounds very attractive and plausible. Those who advocate it persuade many, but never do they persuade one who has a sound comprehension of traffic management. There are many sound arguments against this compartmentation or fragmentation of traffic management. I can illustrate the general tenor of most of them by stating that it is essential that one brain or group of brains direct the routing of a single shipment from its point or origin to its final destination. Let us assume that traffic management has been fragmented into its three components. Let us consider a single shipment that involves only land and sea transport. And let us suppose that this shipment originates in Ohio and is destined for Tokyo. First it falls into the hands of the land transportation traffic manager. He is interested in getting this shipment to tide water and off his hands in the minimum time and at the minimum cost. He, therefore, routes it from Ohio to Hampton Roads. This does not suit the sea transport people for it involves the long haul from Hampton Roads through the Canal and out to Tokyo. The sea transport people would much prefer that the shipment be consigned to San Francisco where they can pick it up and carry it to Tokyo for the cheapest rates and in the shortest time. If, however, a single brain is planning the movement from its point of origin to its destination, this brain might well balance all time and all costs and arrive at the solution that the cheapest over-all routing within the allowed time would be to ship by rail
from Ohio to New Orleans, and by sea from New Orleans through the Canal to Tokyo. There are similar arguments predicated upon the use of premium transportation and others upon the budgetary problems involved. The operation of sea transport has been assigned to the Navy, and the operation of MATS has been assigned to the Air Force. Regretably there are no major land carriers which are owned by the Department of Defense and the operation of which could be assigned to the Army. It, therefore, looks as though the Army has been short changed. Unless I have missed some important point the probability is that within a very few years the Army will find that it has gained rather than lost in this assignment for it looks very much as though the Navy will ultimately be required to assume budgetary responsibility for MSTS and the Air Force a similar responsibility for MATS leaving the Army unburdened with any similar responsibility since all three services are required to budget for their land transportation. Those who advocate fragmentation of transportation do so because they mistake carrier operation for traffic management. It is the first which has been assigned and not the second and there is no direct relationship between the two. Unfortunately it is not only those who cannot differentiate between carrier operation and traffic management who are advocating this fragmentation. There is also a group of people who would expand their own empire. I point the finger at no one department. All three have their empire builders in the fields of transportation.

It is perfectly true that in assigning carrier operations to the Navy and to the Air Force certain traffic management functions have gone to those two services incident to this assignment. These traffic management functions are essentially those of routing once the cargo has been made available to the carrier. In the case of MATS this is of little significance in view of the fact that the charter of private planes has been reassigned by MATS to the
three departments, MATS only retaining clearance to be sure that chartered planes are used to maximum capacity. In the case of MSTS the three departments, as shippers, have the right to lay down their cargo at any port they choose. From there on it becomes the responsibility of MSTS to deliver the cargo to its overseas destination and in the time specified. MSTS has the choice of using ships of its own or of using commercial bottoms. Those who advocate this system say that, in effect, MSTS has embraced all ocean carriers and, in effect, there is only one carrier. Hence, routing is a matter of little, if any, concern to the shipper. I, for one, do not agree with this and am actively advocating that the three departments each pay for their cargo which is shipped in commercial bottoms at tariff rates and that they retain the right to specify that their cargo shall go by such shipments and on such ships as they select with MSTS merely negotiating the contract for the lift. If this is done, each service will have retained all that is essential in traffic management.

Incident to the effect of unification on military transportation the question of priorities in traffic management has received considerable notice and to date there is no generally agreed upon policy with regard to priorities. Since priorities in many instances determine the sequence of shipment and in other cases result in premium transportation, it is obvious that there is need for an accepted policy with regard to them. One school of thought advocates priorities predicated upon categories of material. Under this concept, for example, bullets might always precede beans, and beans always precede general stores. It may be perfectly true that under normal conditions, ammunition is more important than food, and food is more important than general stores, but this is not always so and we come to the belief of the second group who maintain that priorities are predicated upon need and not upon categories. Why should ammunition, they say, always come first when
you may have plenty of ammunition and not enough food? Or why should ammunition and food both come ahead of general stores when you may have plenty of ammunition and food and be in dire need of general stores? So they say that priorities are predicated upon need and further that only the shipper, or the owner and user of the material, can determine need. This issue I hope to see settled in the very near future and settled by the establishment of the policy that need determine priority.

No discussion of traffic management would be complete without consideration of the newest medium of transportation, namely, air lift, and on no subject in the field of transportation is their wider divergence of opinion, than there is on the matter of air lift. First, we have those who advocate it because they believe in anything pertaining to air, and those who oppose it because they have never been satisfied that the airplane is here to stay. There are those who distort the incomplete statistics of air lift during the war to prove any point of view they may happen to take, but air lift is here and it is here to stay. The question to be answered is, to what extent can it be relied upon and how can it best be used. The statistics of the last war are really of little help. First, few statistics were collected because people were more interested in getting the job done than in recording what it took to get it done. Next, air lift just grew and it grew in an unplanned but surprisingly rapid fashion. And, third, there were many flagrant misuses of air lift, some through lack of understanding of its potentiality and of its cost and some through downright selfishness. There are many of us who operated in overseas supply fields during the war who remember being denied air lift for vitally needed supplies only to find that the next incoming plane was loaded with a mahogany bar and slot machines for some air field being established, or with wolf bait for some VIPs in the big cities of the ETO. Be that as
it may, the recent war convinced us that air lift was a factor in modern logistics.

As of the present our approach to air lift is not too intelligent and our thinking on that score can be illustrated by the conclusions reached by a certain clergyman who found himself confronted by a couple desiring to be united in matrimony. Their appearance led him to inquire of the groom his age, and when the response came forth, "75," the clergyman asked "and why, sir, do you desire to be married?" The prospective groom said "Because I want an heir." The clergyman then turned to the prospective bride and asked her age. When told that she was 68, he asked her why she wanted to be married, and she said that she too wanted an heir. This led the clergyman to come to the conclusion that the couple were "heir-minded," but not "heir-conditioned." And so it is with our thinking. We are air minded but not air conditioned. We ship by air in part as an attempt to make up for mistakes in planning. We ship by air because we know that air travel is fast. We have yet to analyze our air lift and find out to what degree it is dependable, when air cargo is grounded how rapidly can we move the cargo to other means of travel, what is the true cost of air lift, what actual saving in time can be counted upon and what categories of material are best suited for air lift? When we have the answers to these questions and we apply them properly, air lift will be on a much firmer and more satisfactory footing.

The true cost of our military air lift today is staggering. The reliability is very low. The average time saved is very little, but if we take the time to do some research, we will find our present cost of military air lift well worth while, and when I speak of research I am speaking of research in the actual operation of a carrier service and in the actual traffic management which accompanies it. I am not one of those who believe that in the next war
we can dispense with supply depots and we can dispense with ships, all because everything will be brought by air immediately from the factory to the consumer's hands. I am one of those who believe that substantial quantities of high priority cargo will and must be transported by air, and to do this satisfactorily we must have uniform documentation, we must have a route pattern to serve the customer's needs, operational performance must be measured in terms of customer satisfaction not in terms of pilot satisfaction. Parenthetically I define pilot satisfaction as on-time departures plus flight safety plus a high degree of aircraft utilization and similar factors. And, finally, we must have some rules of thumb by which we can readily determine when the expenditure of fuel and the use of expensive equipment involved in air lift are warranted. In other words we must know when we should ship by air and when we should not ship by air. We need cargo aircraft designed for specific ranges and specific loading and discharge conditions. In short what I have said about air lift is that it is an infant, a lusty infant it is true, but nevertheless an infant.

Many of the schemes to achieve economy, which have been presented to the Department of Defense in the name of unification, would be perfectly sound if the Department of Defense were a business, the objective of which was to show a profit. But when they decrease the effectiveness of the Department of Defense as a military organization, they are without merit and definitely detrimental. The flaw in many of the schemes pertaining to logistics lies in the fact that all areas of logistics must be responsive and responsible to the tactical and strategical commanders, and these schemes do not recognize this fact. Transportation, being one of the components of logistics, must be also responsive and responsible to command. This is true in peace of traffic management and in war it is true of both carrier-operations and traffic management. It is for this reason that I stated earlier that the three military departments are already of the opinion that it would be unwise to centralize the traffic management of
the three military departments in any other agency of the Government. This is also the reason why each of the three military departments in establishing the Central Military Land Transportation Office reserved unto themselves the most important functions of traffic management. It is a self-evident fact that the efforts of the strategists and of the tactician are of no avail even though with the utmost brilliance they bring their forces to bear at the critical point and at the crucial time if those forces are without reserves and without supplies. The military commander must have assurance that his reserves of personnel and his requirements for supplies are delivered to him when and where he wants them, as well as in the quantities that he requires. It is transportation which gives time-place utility to material and personnel. It is time-place utility that the commander requires. He must be completely sure, therefore, of his transportation and in order to be completely sure his transportation must be a component of his command subject to his will.

During the recent war the Army established a Transportation Corps. It was the mission of this Corps both to operate carrier services on land and sea and to act as traffic manager for the material and personnel of the Army when in transit. The people who constitute this Corps are exceptionally able in their field. The job they did during the war was outstanding, but having moved abroad, returned to the United States and then moved elsewhere abroad fabulous quantities of material and tremendous numbers of persons, these people made the mistake of believing that they were operating a distribution system, particularly with respect to supplies, and since the war ended they have spent a great deal of time developing what they call the "factory-to-soldier program." They are excellent traffic managers and I have pointed out that traffic management requires skilled technicians in a highly complex field, but they have overlooked the fact that the control of the distribution of material
requires just as highly trained technicians in a field quite as com-
plicated and possibly more extensive. Careful analysis will show that
traffic management is a tool of supply just as carrier operations are
a tool of traffic management.

In summation I wish to stress the following points:

(1) Transportation is a large part of logistics, and logistics,
according to Field Marshal Montgomery, is 85% of modern war.

(2) Transportation is a function of command.

(3) Transportation is a chain, and in times of maximum use its
links should be of equal strength.

(4) The traffic manager must be a highly trained and skillful
 technician for traffic management is very complex indeed.

(5) Effectiveness being the all important criterion of a military
machine, consolidations predicated upon economy without effectiveness are fatal.

(6) The shipper should be able to exact from the carrier the
service he requires and the services of the carrier should be
predicated upon the needs of the shipper and not upon the convenience of the carrier.

(7) In modern traffic management air lift should be neither
over-emphasized nor ignored. It is an infant whose growth should
be watched and stimulated.

(8) Transportation is a tool of supply, not the director of
supply.

(9) Finally, I offer the point that the logistician must have a
real appreciation of traffic management, but he should not attempt
to be a traffic manager. The man who defends himself in court has
a fool for a client, and the logistician who does his own traffic
management is no logistician.
RECOMMENDED READING

This section lists material published in current periodicals which will be of interest and value to Navy officers.

"I Stalked Submarines With Our Hunter-Killers"
by W. J. Holt, Jr. Saturday Evening Post. March 11.

"Bargain in Turkey—Here's One Place We've Spent Our Money Well"
by Hal Lehrman. Fortune. March

"We Are Losing Asia Fast"

"Air Power and the German War Economy"

"Industrial Mobilization Planning"
by RADM. D. H. Clark, USN

"Naval Research and Development in World War II"
by RADM. Julius A. Furer, USN (Ret.)

"Is War With Russia Inevitable?"

"Prescription for Survival"

"The Facts of Diplomatic Recognition"

"Report on Italy"

"The Hydrogen Bomb"

"I Was There"

"Defense: How We Stack Up Against Russia"
by the Editors of Newsweek. Newsweek. March 13