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THE TACTICS DEPARTMENT OF THE WAR COLLEGE
AND THE RELATION BETWEEN IT AND THE FLEET.

LECTURE DELIVERED BY

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C O N F I D E N T I A L

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THE TACTICS DEPARTMENT OF THE WAR COLLEGE
AND THE RELATION BETWEEN IT AND THE FLEET.

Admiral McDonald, Officers of the Fleet:

The subject assigned for today appears to me to be one of vital importance and I hope that when I have finished this talk it will not only have brought that fact home to you but will have aroused such interest as to cause the Fleet to so utilize the College and its methods that hereafter the Fleet and College will go together along that way which seems to be "the only way" if we can ever hope to have success in battle. I have just completed the regular course at the War College after having been Chief of Staff of the Atlantic Destroyer Force and what I will present as the relation of the College to the Fleet as regards battle tactics is as I see it immediately after working in both, - in one in an effort to prepare an important subdivision of the Fleet for its place in battle, in the other in an attempt to prepare myself as all officers must prepare if the forces they command are to win in war.

In my work in the fleet I found the Force I was attached to could not progress far in its preparation for battle without certain things that are found only in the War College methods, and in the College I found that students cannot go far in preparing themselves for command in battle unless the fleet does certain things for itself and the College. It is my intention to reiterate what the things are that each can do for the other and it

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is my hope that by having them recalled to mind we will all get together not just to the end of making the College more efficient but to that greater end of making our fleet the only fleet that will always win in battle.

That there may be a clear understanding of the subject, we must start from a common point. It is necessary to have not only a clear conception of the naval battle of today but also to keep in mind what officers must do if their fleet is to be in a position to win a decisive victory in that battle. Therefore before going into the relationship between the Fleet and the Tactics Department let me refresh all of our memories as to the tactics employed in a naval battle of today by reading to you a pamphlet just issued by the Tactics Department and entitled "The Naval Battle". Having that before you I can point out how the Fleet and the Tactics Department can dovetail to make a smooth and complete working part in the machine that is to win decisive victories for us.

WAR COLLEGE CONCEPTION OF THE NAVAL BATTLE OF THE FUTURE

The War College conception of the Naval Battle of the Future as given in this paper is based on the present War Instructions and follows closely the general plan employed by both fleets in the Battle of Jutland.

At the Battle of Jutland submarines, mines, and aircraft were not present except in their moral influence. At the War College they are used in tactical maneuvers and in its conception of a naval battle they are included just as they are of course included in the battle plans of the Fleet as indicated by the War Instructions.

The general term applied to the courses of action taken in battle is tactics, which term covers all of the operations of a force from the time it approaches another to engage until it is again out of touch. These courses of action divide themselves into two classes; first, those having to do with the general plan of the battle and which are covered by the term major tactics, and second, those having to do with only a part of the force as it carries out the details of its task under the plan and which are covered by the term minor tactics.

Major tactics decides on the role in battle of each subdivision of the force and places the subdivision where it can carry out that role; minor tactics covers the courses of action taken by a subdivision in carrying out its roles. Minor tactics has many branches, such as battleship tactics, destroyer tactics, submarine tactics, air-tactics, etc., each developed to make use

of the peculiarities of the type to which it applies. At the War College it is assumed that the student officers are as familiar with minor tactics as they are with the other fundamental parts of a naval officer's education such as navigation, gunnery, international law, etc., so that at the College minor tactics are dealt with only incidentally. (NOTE: The assumption that student officers or any officers are familiar with the minor tactics of each type of craft is entirely unwarranted since the minor tactics for most of our forces not being fully developed they can hardly be expected to be generally known.)

The War College conception of a naval battle as given in this pamphlet does not go into the field of minor tactics but on the contrary confines itself to the major tactics which cover the work of a "battle force" as a whole. Although minor tactics will not be dwelt on in this paper any further than to state the general principles that govern them as well as major tactics, one must not overlook the importance of such tactics. Sound major tactics makes the winning of battle possible, but only sound minor tactics wins them. The one is under the province of the high commander, the other under the subordinate commanders. However a subordinate commander can make but little progress with his minor tactics until he thoroughly understands just what he is expected to accomplish in battle, and the purpose of this paper is to develop such an understanding. It will analyze battle tactics from the view point of the high commander, which having been done opens

the way for subordinate commanders to analyze and develop the minor tactics necessary to enable them to do successfully the things major tactics calls for.

I. Analysis of Tactical Dispositions and Operations in Battle.

Procedure followed in the Analysis.

The operations of a fleet in battle have four distinct phases; First, the approach toward and development of the enemy force; Second, the deployment to engage it; Third, the engagement and Fourth, the "follow up". The critical phase of battle is the engagement, and the key to all battle tactics lies in that phase. Therefore, in order to analyze and develop sound battle tactics, we must begin with the engagement phase to determine the tactics to employ in it, knowing which we will be in a position to determine the tactics to employ in the preceding phases to bring about the tactical situations we find to be required if we are to succeed in the fighting phase. When we have done those things we can proceed to the "follow up" stage, which, if a victory is to be complete, must be carried through even more thoroughly than any other phase of the battle. But, as stated, the key to the whole situation lies in the engagement phase, and before one can proceed to an understanding of tactics, he must have a thorough grasp of the principles that govern in that phase.

(1) Variations in sea tactics limited.

As compared with land battles the possible combinations

of forces and movements in sea battles are somewhat limited. The forces on either side are practically restricted to those created before the war opens, and each commander has a pretty fair idea of what he will meet. The terrain of battle, the sea, offers only a few peculiarities that can be taken advantage of by either side. The one great uncertainty in a modern sea battle comes from the movements of the forces, yet even these are more easily detected than in land battles and are restricted by the known speed and maneuvering ability of ships. For these reasons it is possible to establish a much more definite general plan to be followed in any fleet engagement with a certain enemy than it is to establish such a plan for land battles in each of which forces, terrain, and positions have more influence on the tactics to be employed than has movement. Let us see what such a general plan should be for a modern fleet, bearing in mind of course that while the general plan will be the same for all battles against a certain enemy the details if its execution will differ in each battle since each part of the fleet, though carrying out its mission as called for by the general plan, will in carrying that mission out have to operate in conformity with the special situation confronting it at the moment.

(2) The Weapons of the Sea.

The weapons of modern navies are guns, torpedoes, bombs, and mines, all used to destroy enemy fighting craft in order that one's own craft may remain in control of the sea. While under favorable circumstances any one of the weapons is sufficient-

ly destructive to prove decisive, nevertheless, owing to the development of the defense against it, unaided, not one is capable of winning a decision against a combination of all. Aided by the gun other weapons can be made to exert a decisive effect, or aided by other weapons the gun can be made decisive. But because of its protection against destruction and of its great range, accuracy, rapidity, and hitting power the gun can do the greatest damage of any weapon and for that reason tactical effort in modern sea battles is still centered around the gun action and the other weapons are made to come into the engagement to aid the gun or to take advantage of situations developed by it. Only by combining the effort of the several weapons can each be made to exercise its maximum influence toward destroying the enemy, and the end and aim of tactics is to bring about such coordination of effort of one's own weapons that by their concentration they will destroy the ships carrying those of the enemy.

(3) Types of ships found in battle.

Naval weapons are carried on ships of various types, the types being more or less standard in all navies. As a general rule each type has been developed to utilize one of the weapons as its primary weapon and though it may carry other weapons they are of secondary importance, the ships of a type being operated in battle in a way to make their primary weapon most effective. Thus while capital ships carry both guns and torpedoes the gun is their primary weapon and capital ships are

operated in battle to make the guns most effective. While destroyers carry both torpedoes and light guns, the torpedo is their primary weapon and the movements of destroyers in battle are to the end of getting their torpedoes home against enemy capital ships. Light cruisers, which carry intermediate guns and torpedoes, have a dual role, the torpedo being the primary weapon against capital ships and the gun primary against light ships. Fleet minelayers carry both mines and torpedoes but the mine is primary until expended at which time that type changes its mission and tactics so as to make the torpedo effective. Anti-submarine craft carry both depth bombs and torpedoes, the depth bomb being primary when operating against submarines, the torpedo when operating against heavy ships. Fleet submarines carry only torpedoes and their function is to get them home with maximum effect on the enemy. Bombs and aerial torpedoes are launched from aircraft, which latter must be carried to the scene of the engagement in "carriers". The weapon of the air-craft carrier is aircraft and carriers are operated to the end of putting their air craft in a position from which they can be sent out to deliver effective attacks with their bombs and torpedoes.

In addition to having the paraphernalia necessary to make its primary weapon effective, each type of ship has been given such other characteristics as will best enable it to make use of that weapon. These characteristics are expressed in size,

protection, speed, maneuvering ability, submergence, etc. Thus we find in modern fleets types of ships as follows:

- (1) Battleships, of great size, medium speed, heavy armor, many heavy guns, and several airplanes.
- (2) Battle cruisers, of size equal to battleships, high speed, little armor, heavy guns, and several airplanes.
- (3) Destroyers, of small size, high speed, many torpedoes no armor, small guns, with one small airplane.
- (4) Light cruisers, of medium size, high speed, no armor, intermediate guns, some torpedoes, and two scouting planes.
- (5) Light mine layers, similar to destroyers but carrying mines at the expense of some torpedoes.
- (6) Anti-submarine craft, similar to destroyers but carrying depth charges at expense of some torpedoes.
- (7) Submarines, of medium surface speed carrying only torpedoes, and
- (8) Air-craft carriers with characteristics similar to battle cruisers but carrying light guns and airplanes instead of heavy guns.

(4) Coordination of effort between types in battle.

With so many weapons carried on such different types of ships it is apparent that if we are to get the maximum effect of all weapons and make our blow the sum total of the blows

of all, there must be perfect coordination between the types carrying them. The gun being the only weapon of past years and at least for the present continuing to be the most powerful weapon, sea battles have revolved for centuries around the ships carrying heavy guns. As other weapons came into being each endeavored and still endeavors to wrest supremacy from the gun and hence in battle the efforts of each type of ship are directly or indirectly against the ships that carry the heavy guns. However as each new weapon came to threaten the gun carrying ship, steps were taken to counter it and it is upon the attacks and counters of the types carrying the various weapons that sea tactics are based. We have as the dominating phase in battle the gun fight between heavy ships, which fight establishes the main line of battle. Then we have the attacks on the battle line by vessels carrying torpedoes or mines, the idea of which is to make the enemy heavy ships either accept the torpedo or mine menace or else pay a decisive price in gun fire in maneuvering to avoid it. Against such attacks we have the counter made by fast light cruisers which by their speed and superior gun power can prevent the surface torpedo craft or mine layers from obtaining the position to deliver their attack. Again we have the attacks of submarines which are directed against the heavy ships and which are countered by anti-submarine craft carrying depth bombs. Finally we have air attacks which can be countered only by air attacks but which can be prevented if the air craft carriers are attacked in such a way that they cannot launch their planes.

The role of each type in the Coordinated effort.

From the foregoing, it appears that what we call tactics is in reality the movements or actions necessary to insure getting home the attacks of one's own weapons while preventing the enemy from getting his attacks home. As before stated the common center for each side in an engagement is the engaged battle lines, and the approach and deployment for battle must be such as to not only establish one's own heavy ship line to the best advantage for engaging that of the enemy but also such as to place the ship's carrying other weapons where they can deliver their attacks in coordination with the gun attack at the same time that they prevent the enemy delivering his. Hence in order to establish fundamental tactical principles we must have clearly in our minds the general plan of procedure each type of ship should follow in battle. To do this let us start with the center of the engagement, the fight between the heavy ships, and then take up the parts that radiate about it as the different types attempt to join the issue and exert the deciding influence on it.

Battleships. (See Diagrams I, II, III.)

Necessities of design give heavy ships their maximum hitting power when firing on or near the beam, hence in sea battles heavy ships naturally take a formation approximating to column and endeavor to hold the enemy about abeam and under the fire of all heavy guns. The most advantageous position one battle line can gain over another is the "capping" or "T" position by which that line is in a position to fire its full

broadside against the enemy while the enemy can reply with only the end on fire of his nearest ships. The position equally favorable to each of two engaged battle lines is when they are abeam of each other. The "T" position being so overwhelmingly advantageous, each battle line endeavors to obtain it for itself, or to approximate it as nearly as possible, while preventing the enemy from doing anything of the kind, and for this reason we have as the first principle of battleship tactics that of keeping one's own line always normal to the bearing of the center of the enemy's line. Both before and during the gun fight between heavy ships this principle must be observed and it is because all competent commanders follow it that the opening of an engagement between heavy ships almost invariably finds the two lines on approximately parallel courses and almost abeam of each other. We therefore start from this position in evolving the theory of modern tactics.

Although the heavy ship engagement usually starts with nearly equal conditions between the lines of heavy ships due to their being parallel and about abeam of each other, each line naturally attempts to gain the most advantageous position, that of the "T". Now the position where the lines are most nearly equal gradually changes to where one has the maximum superiority as one column gradually draws ahead of and across the end of the other column to the "T" position. (See Diagram IV). The battle line that draws ahead of the other and keeps itself perpendicular to a line from its center ship to the nearest enemy ship while doing so, not only has its full broadside bearing on the enemy

line but also, and at the same time, reduces the number of enemy guns that can be brought to bear or kept within range. But to obtain a "cap" or even approximate it, one battle line must have a decidedly greater speed than the other and the other must hold its course. To prevent a cap, even when a column has less speed it is only necessary to turn away sufficiently to always keep the enemy abeam. However in such a turn away grave danger exists since in order to keep the other line abeam, or nearly so, the turn at the head of the column may be abrupt and through many degrees of arc thereby creating a knuckle at the turning point. A battle line so bent is in a bad position. Ships at the knuckle or ahead of it are laid open to concentration of fire while those in rear may be out of range or have few guns that will bear. So important is the bending or breaking of the enemy line, or the forcing it to maneuver under fire, that all commanders seek to bring about one or more of those results and thereby gain an advantage that may be made decisive. However in these days it is hardly possible for one battle line to have sufficient excess speed to secure a "T" or to force the enemy to maneuver or into a knuckle, and, since some such condition must be imposed to bring about a decisive advantage, other types of craft are brought in to produce it. The types that can be used for such purposes are (1) the heavy gunned and fast battle cruisers, and (2) the vessels carrying torpedoes or floating mines. By the proper use of these types their weapons can be brought to bear on the enemy line forcing him either to change his course and sacrifice gun fire to avoid the menace, or to accept the menace and the

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destruction of ships it imposes. In either case the advantage gained may prove decisive hence tactics, to be sound, must be such as to give one that advantage while denying it to the enemy. Let us see how forces should be used to gain it while at the same time they prevent the enemy from doing so.

Battle Cruisers. (See Diagram V.)

Battle cruisers, like battleships, have guns for their primary weapon. Their high speed enables them to do what battleships cannot do, - obtain the capping position or approximate it. However, lacking heavy armor and having but few guns, they dare not engage battleships ship for ship, but must by their speed attain a position from which they can bring their ~~full~~ broadsides to bear while the enemy, unless he maneuvers, can return the fire with but few guns. Hence in battle, battle cruisers have their greatest value as a "fast wing", fighting from advantageous positions against either end of the enemy line, but preferably against the head, and causing the enemy line to suffer either from the cruisers guns or from those of the other heavy ships as he maneuvers to parry the cruiser attack. It is this that determines the disposition and employment of battle cruisers in a general engagement and we therefore accept it as a tactical principle to use them as a fast wing, preferably ahead of the battleship line, with a mission to attack the enemy battle line from an advantageous position and destroy his ships by gun fire or force them to maneuver so the battleships can do so.

From the advantageous position battle cruisers take at the end of the line, they play a dual role in the engagement. Not only are they placed well to attack the enemy heavy ships but from that position their great speed and gun power enables them to protect the ends of their own column from all kinds of surface attacks. A fleet with battle cruisers has many advantages. It is not only able to hit the enemy and hit him hard at his weakest points - his flanks - but at the same time it has a most powerful defense against any attacks on the flanks of its own line. For all their strength however one should always remember that battle cruisers can fill their dual role only when they are within the support of their own battle line. Worked in close coordination with that line they can do much to the enemy line while at the same time protecting their own, and in this lies their strength. But to use them properly and have them always sufficiently supported requires the closest cooperation with the battleships and in the difficulty of doing this lies their weakness. This point must not be overlooked for should the mutual support fail, both the battle line and the battle cruisers open themselves to destruction in detail.

Destroyers. (See Diagram VI.)

In the same way that battle cruisers, through their speed, can gain a position favorable for attacking a battle line with heavy guns and force it into a knuckle or cause it to divide or maneuver under fire, lighter craft of high speed can gain a similar position from which, by attacking with torpedoes or mines, they too can force the same disadvantages on an engaged enemy. Since the

positions least open to enemy gun fire are those on the flanks of his line, such positions are comparatively safe not only for vulnerable battle cruisers but also for the still more vulnerable destroyers and light mine layers. Therefore, destroyers or mine layers sent ahead of an enemy heavy ship line to fire long range torpedoes or plant a mine field have excellent opportunities to compel the enemy to maneuver under fire or accept the menace of their weapons. This fact gives us the key to the employment of such craft in battles and it becomes a principle of tactics to so employ them. Like battle cruisers their stations are ahead, that they may strike if the enemy continues on his course, and astern, in case he turns about.

Thus the position of the types of ships carrying the major weapons of attack is determined for us and in the opening stages of modern battles they will probably be found about as follows: (a) opposing battleships in parallel columns and abeam of each other; (b) all or a major part of the battle cruisers ahead of the battleship line, the remainder in rear; (3) the light attacking craft (destroyers and fast mine layers) ahead of the leading and astern of the rear battle cruisers. From these positions each type will endeavor to hit the enemy heavy ships with the full power of its weapons, overcoming outside resistance as may be necessary to accomplish the desired end. Such will be the general plan in practically all great sea engagements that may be considered as normal.

Light Cruisers. (See Diagram VII.)

In a normal naval engagement, other things being equal, the force that can get the concentrated attack of its several weapons home quickest has every prospect of winning the engagement, and to prevent the enemy getting such a concentrated attack home each side counters the various parts that go to make it up. Such counters, however, are not always carried out by ships of the same type as the attackers. The counter to heavy ship attacks is generally made by heavy ships, but the counter to the attacks of destroyers and light mine layers is made by ships of the cruiser type, by battle cruisers from their position as a fast wing and by light cruisers which have the speed of destroyers and very much heavier batteries. Hence on the extreme flanks of an engaged battle fleet, even beyond the destroyers, we place light cruisers whose mission it is to cover their own light craft in their attacks at the same time that they protect their own heavy ships against the attacks of enemy light craft. With this disposition and use of the light cruiser type in our minds, we have before us the full general plan and fundamental principles for using surface craft for attacking enemy heavy ships and protecting one's own.

Submarines. (See Diagram IX.)

In addition to the offensive types so far discussed as operating entirely on the surface and against surface craft, and which, as we have seen, work in close coordination with each other, we find in battle two other offensive types previously mentioned,

submarines and air craft, which though powerful in attack cannot carry out their role in battle with anything like the precision and coordination possible in the surface types. Though the submarine is a much more recent addition to the battle fleet than the surface types already discussed, its weapon, the torpedo, is not new. Like the torpedoes of surface craft those of submarines, to be effective must be launched from favorable positions, but owing to the limitations imposed on submarines by their low submerged speed and their inability to observe, gaining that position is most difficult. Their great strength lies in the element of surprise contained in their attack but their success is largely dependent on their original disposition as the battle opens and on the movements of the enemy thereafter. Hence no fixed principles can be laid down for their use in battle. All that can be done is to start them out in a favorable position and draw the enemy heavy ships to them so they can attack. This they do at every opportunity with a view to destroying the enemy heavy ships or throwing them into such confusion that surface craft can destroy them. When successful, submarines exact a fearful toll at small cost and though their efforts cannot be relied on as can the efforts of surface craft, nevertheless they always offer the possibility of a decisive advantage. Their mere presence in a certain area may be sufficient to deny its use to the enemy.

Air Craft

As regards coordinating their attack efforts with those of surface craft, air craft also have limitations but for all that their attacks may prove both deadly and decisive. In attacking they too strike whenever they can, injure the enemy as much as possible, and assist in giving surface craft advantages by which the decision may be made complete. But that air craft may do these things their carriers must be so placed both before and during battle that they can launch their planes freely and in safety, and for this reason carriers must be well protected and kept out of the theatre of gun fire. Once launched, planes proceed with their task following the minor "tactics of the air" in doing so just as other forces follow their own minor tactics. However it should be remembered that the first thing the air force seeks is such control of the air as will enable it: first, to protect its own ships from attack; and second, to attack enemy heavy ships. All attacks should of course be made at the earliest possible moment after the engagement opens and when air craft are operated on this principle they follow practically the only principle that can be laid down for them at this time.

Though air craft attacking in battle cannot operate with the precise coordination possible with surface craft, they can and do cooperate very closely with other types in keeping up the flow of information as regards the enemy and in spotting gunfire. In these two things their importance is so vital as to make air craft indirectly a decisive factor whether or not they may be such a factor through attacking. For seeking information or spotting,

as well as for attacking, control of the air is essential and so in modern sea battles we will find a bitter engagement between the opposing air forces in seeking, holding, and exercising supremacy in the air.

Anti-Submarine Craft.

All the types of craft found in the sea battle of today have now been discussed except the purely defensive anti-submarine type. This type merely keeps in positions to protect the capital ships from submarines and as long as it maintains such positions it has no great decisive role to play in battle. But in addition to protecting the heavy ships against submarine attacks, anti-submarine craft, when in position, are able to play another very important defensive role, for should the line they cover suffer too much from gun fire the anti-submarine craft are in excellent position to cover it with smoke and thereby reduce the damage being done. While such defensive tactics will not win a battle they may prevent one's losing it and for that reason a fleet must be ready to use them whenever necessary.

(5) Approach and Deployment. (See Diagram VIII.)

With the general idea in our minds of the role each type has to play in the engagement phase of battle and of its approximate station as that phase opens, we are in a position to determine the disposition and tactics to employ in approach and deployment. To do this we again start with the heavy battleships, taking up the other types in turn just as was done to determine the dispositions and procedure in the fighting phase.

The Approach.

It is evident that whatever happens it is desirable to bring the maximum gun hitting strength of heavy ships to bear on the enemy at the earliest possible instant in battle, and because of that fact battleships must be kept concentrated during the approach. Also it is evident there can be no certain knowledge as to the exact bearing of the enemy line from one's own line when contact is made. For this latter reason, in the approach, heavy ships cannot be placed in a battle formation to close the enemy but must take some other formation from which they can deploy quickly for engaging on such course as happens to be normal to the bearing of the enemy heavy line as the contact is made. Without going into details as to why, it has been found that the best formation for heavy ships from which quick deployments can be made in any direction and in any order is some form of a "line of division columns", and heavy ships are always kept in such a formation, with its general line of bearing normal to the expected bearing of the enemy when sighted, whenever there is any possibility of meeting him. It is impracticable to discuss these formations or the deployments therefrom at this time and it is unnecessary to do so. It must be accepted as a fact that battleships can and must be in such a formation when battle seems even a possibility and that from such a formation they can deploy quickly on any course and in almost any order of divisions. Bearing this in mind we may pass on to the disposition and formations of the other types of ships during the approach.

The two fundamentals of a sound approach formation are:- first, that it will locate the enemy in ample time for the deployment or protection of heavy ships before they can be attacked and second, that dispositions in it are such that all ships can attain their engagement stations by the time the heavy ships are within gun range of each other. Were there an unlimited number of ships of the types other than heavy, it would not be difficult to provide both for scouting and screening and still have a full battle fleet in concentration ready for a quick deployment for battle. As things are, however, the battle fleet has to do much if not all of its own scouting and screening, and the task of providing for both while at the same time holding all types ready to take their positions and play their roles in the engagement is very difficult. Not only must all types be in correct position and ready to engage as the heavy ships come within range of each other but immediately prior to that time they must be in a position to locate the enemy, prevent surprise attacks of all kinds, and deny the enemy information. Assuming that the heavy ships will be in division columns on a general line of bearing not far from normal to the direction in which the enemy will probably appear, what during the approach should be the disposition and procedure of the other types found in the battle fleet?

The ships nearest the battleships will of course be those of the anti-submarine type. Beyond them there must be ships for protective scouting and offensive screening, and still further beyond ships for searching and contact scouting. These

necessities largely determine the disposition of ships in the approach, and in the several advanced lines that result from meeting these necessities we find ships of all the types except possibly battleships and air craft carriers, and when battle cruisers are lacking, even battleships, if they are fast, may be found in them. Covering the front and flanks of the battleship force at a distance of from five to ten miles there should be a protective screening and scouting force of light craft such as destroyers and light mine layers. From ten to thirty miles from the battleship force there should be a searching and contact scouting force made up of high speed ships strong enough not only to prevent enemy light craft from piercing their line but also to force their own way through light enemy screens and gain contact with his main body. Though many dispositions can be laid out each of which will do these things, in general any good approach disposition will take a form about as follows:

First: Leading the fleet from ten to thirty miles in advance of the battleships and covering the direction of their advance both on the front and flanks a force of light cruisers (and submarines if available) to do the scouting and contact searching.

Second: Within supporting distance in rear of the scouting and contact searching force, a support of fast heavy ships, if available, and preferably battle cruisers, concentrated by divisions on the line of advance, on either side of it, or in all three.

Third. Near the supports, and preferably well to each side of the line of advance of the main body, attacking submarines concentrated by divisions.

Fourth. Between the supports to the scouting line and the main body, the protective screen of destroyers or fast mine layers, concentrated, as far as their numbers and the area to be covered permits, in sections, divisions, or squadrons, and ready for further concentration as deployment takes place.

Fifth. In rear of the protective screen the battle fleet in a quick deployment formation.

Sixth. Around heavy ships whenever placed, an anti-submarine screen of ships of the destroyer type.

Seventh. With the main body, the aircraft carriers.

Only in some such formation as that just indicated, should opposing fleets approach each other. Because of the very great area covered no one part of a modern fleet in that formation is visible to all the other parts nor can enemy ships outside of or even on the edge of the formation be seen by more than a few ships in it. Yet the fleet must bring itself into concentration for battle and move the concentration to where it can fall on the enemy under conditions favorable for success. To do these things requires the utmost precision both as regards position during the approach and movements in deploying. In order that all contacts made can be reported and plotted with sufficient accuracy to enable the sub-division commanders to carry the deployment and engagement through with precision and rapidity, all

ships of the battle fleet, at all times during and subsequent to the approach, must know their exact positions with reference to what we may call the "standard position" of the battleship force. Therefore in the approach all ships must keep their stations accurately with reference to the main body and, to facilitate this, ships for "linking up" positions by visibility must be provided in approach formations. Keeping stations accurately by distances and bearings passed through the linking up ships, and aided by frequent "reference position" reports sent out from the main body, a fleet is not only in a position to bring itself into battle deployment promptly but is able to do so at any particular point called for by the reports of contact. So vital is this feature to successful deployment, and therefore to success in battle, that the utmost attention must be paid to it. Ruinous through a faulty approach formation may be, almost as great disaster can result from one in which the positions of the parts are not sufficiently standardized to those of the battleship force as to make accurate deployment possible.

(6) The Deployment.

When the advanced portions of approaching fleets make contact with each other they at once endeavor to develop the enemy forces in rear and when the heavy forces have been located and reported, the fleet can then take steps for its deployment. In deployment there are more things to consider however than the mere arrangement of one's own forces with reference to themselves and to the enemy. Important as is the disposition

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of one's forces for battle there are several other points that must be given consideration before deploying. Among them are the weather and lee gauges, spray, light, interposing between the enemy and his base, etc. Each of these points or a combination of them can easily become the decisive factor in the battle, so much so that in determining the direction of deployment they must be carefully considered. When the battle fleet commander has the power to choose and other things are equal, he must select a deployment course that will offer him the major portion of the advantages and the fewest disadvantages as regards wind, sea, light, etc. Having decided the direction of deployment from these things or others more vital, he is ready to issue the orders for the deployment. (See Diagram IX.)

As previously stated the deployment from the approach formation is one of the most vital features of battle. Just as decisive advantages from wind, sea, light, etc., may be gained or lost by the direction in which deployment is made so decisive advantages as regards the position of one's forces as the engagement opens may be gained or lost in making it. Each part of the fleet must know its station and proceed to it, but owing to their dispositions during the approach their doing so is far from simple. The easiest part in deployment falls to the battleships and their anti-submarine screen, for concentrated as such ships are their movements are simple. With other forces it is very different. The light cruisers, far distant in the van and on the flanks, and widely dispersed, not only have to assemble during

the deployment but while doing so must reach their engagement stations on the far extensions of the heavy ship line by the time that line is ready to open fire. Similar feats must be carried out by battle cruisers, destroyers, and light mine layers, while the attacking submarines must attain positions either close to or ahead or astern of the enemy battle line after its deployment.

(See Diagram VIII.)

So complicated is accurate deployment from an approach formation that a very careful doctrine must be followed by all parts of a fleet while making it. Roughly, the various surface types distant from the main body divide themselves into three groups, a center group and two flank groups. In deploying, the two flank groups form the extension of the battle line on their respective sides, while the center group joins the flank group that is in the van of the battleships after the deployment is complete. Following such a simple doctrine for deployment and using a disposition in the approach formation that will facilitate it, it is possible to effect a deployment with considerable precision and with the result that van of the battle line will be covered by (1) a "fast wing" made up of two-thirds of the fast heavy ships, (2) an "advanced attacking force" made up of two-thirds of the destroyers and light mine layers, and (3) an "advanced covering force" made up of the two-thirds of the light cruisers. Under this doctrine and at the same time that the van becomes covered by about two-thirds of the fast though lighter craft, the rear becomes covered by the remaining one-third of these

types. This disposition of the light fast forces completes the main fighting line but of course does not include the submarine or air craft types. As for the former, from their positions (1) in the searching and contact scouting line or (2) assembled near the supports of that line, they proceed at once to place themselves where they can attack the enemy heavy ships, acting on their own judgment from this time on and making every effort to get their torpedoes home, using the general battle plan to guide them in their efforts.

As for air craft they play a most important part in the approach as well as during action. Ships on searching and contact scouting duty use their planes to assist in locating the enemy and in determining his strength, disposition, and movements. Planes from other ships, including carriers are also used for this work when necessary though usually such planes are reserved for the engagement and later phases. The air craft carriers usually remain with the main body until deployment comes at which time they take station on the disengaged side of the heavy ships and continue to send up planes as necessary to obtain and keep control of the air and to exercise control through attacking enemy ships, spotting gun fire, reporting enemy positions, movements, etc.

Tactical Principles. (See Diagram IX.)

We have now deduced in a general way the dispositions in, and the procedure of a battle fleet from the time it begins approaching an enemy until the fleets are engaged. It is impossible to lay down for the operation of a fleet, as a whole or as

to its parts, in engagement anything more definite than the general plan. However, when a fleet as a whole and in each part is familiar with such a plan, and when the commander of the fleet and the commanders of each part are thoroughly indoctrinated with it, are imbued with the initiative, and have the will to win, the fleet will operate as a team to produce the desired results even though nothing definite can be laid telling the commanders in detail how to go about doing it. The possible combinations standing in the way of any commander as he tries to carry out his part in the general scheme are infinite in number and variety and for that reason no commander can be given a one sure and certain method of procedure that will gain the desired results no matter what happens. The recorded experiences in battle however have shown that certain principles, when followed, tend to bring success and when not followed tend to produce failure or disaster. Therefore let us discuss the more important of these principles to the end of applying them so far as they fit, to our own tactics.

The Basic Principle.

The fundamental principle of engagement tactics, axiomatic on its face but proved by history and confirmed on the game board, is tersely expressed in the phrase "Superiority of force at the point of contact." By this is meant, one's tactics should be such as to isolate for the time being from the full support of the remainder of the fleet such portion of the enemy's fleet as one is engaging, while at the same time a superior part of one's own force is brought to bear on the isolated portion. It should not be

gathered from this that superiority of force at the point of contact can be obtained only through causing an enemy to divide his fleet and throwing one's own fleet against a part, though that is one way of obtaining the superiority referred to. An able commander will not usually divide his fleet but for all that a fleet not divided so far as distance between its parts is concerned can still be put in such situation that there is not full mutual support between all its parts or even between all the units in one certain part. For instance a capped battle line or one maneuvering under fire has not mutual support throughout itself, and concentration on a portion of it at that time is one method of carrying out the basic principle. Similarly the falling upon a fast wing from a direction that prevents its being supported by its battle line, or the bringing of a full line to bear on an enemy line only part of which is in range answers the requirements. It is impossible to indicate the innumerable ways in which superiority of force at the point of contact can be gained, for those ways begin to develop in the deployment and continue throughout the engagement, but commanders must be constantly on the lookout not only to create such situations and take advantage of them but also to prevent the enemy doing so. The dispositions already deduced for approach, deployment, and opening the engagement tend to give such concentration in a fleet that if it is maneuvered properly it is at all times ready to exert great strength against any and all points of contact and this is as it should be both for offense and defense. How the fleet and its parts move thereafter to obtain and retain superiority at the point of contact

is of course in the hands of the commanders but if they are to have success in it they must have a clear conception of what is meant by it.

The "point of contact" referred to in the expression is of course any point where the opposing forces are engaged and such points may be divided into two classes, one the main point where superiority has a decisive effect on the battle as a whole, the other the secondary points through which certain parts of the fleets pass in their attempts to reach the main point and influence the main decision. However, whether the point of contact of any part of a fleet at any particular instant is main or secondary, the principle to be followed by the commander is always the same, - his tactics must be such as to develop a superiority for his own force.

The Objective.

It is evident that if one is to gain success in battle the points of contact referred to are something more than mere haphazard points where parts of opposing fleets happen to come together. As a matter of fact the main point of contact is determined by the main objective in the battle while the secondary points are determined by the immediate objectives forced on parts of a fleet by the counters they meet in trying to reach the main objective. Hence it is very vital in battle that commanders have not only a clear conception of both the main objective and their immediate objective at every instant, but also that they clearly understand what constitutes gaining the immediate objective to the

extent of permitting them to drop it and proceed toward the main. Thus after the basic principle of "superiority of force at the point of contact" we have as a first secondary principle "the efforts of a fleet must be directed toward the objective and that objective must be the proper one for the instant and for the force concerned".

That the objective of a fleet as a whole is the enemy fleet, is, of course, self evident, but the immediate objective of any part of one fleet is not just any part of the enemy fleet that happens to come near. On the contrary, it is only such part of that fleet as lies in the way of reaching the main objective. To get an understanding of the immediate objective of his force at any given instant in battle, a commander has but to look upon the battle as a whole. Remembering that the foundation on which the work of any fleet is built is its heavy battle line and that when the enemy's battle line is broken or destroyed his whole fighting structure will crumble, it is evident that the main or primary objective of all parts of a fleet in battle is the opposing battle line. Every part of the fleet that can hit that line a blow must do so at the earliest possible moment and must keep hitting it as long as the line exists and blows can be struck against it. However, in their attempts to strike that line, the various forces meet counters to their attacks and when they do they must destroy or evade the countering forces to such extent as will permit their proceeding to the main objective. Thus the countering forces frequently become the immediate objective of

an attacking force and because of the necessity for clearing them from their path, subdivisions of a fleet often lose sight of the main objective and become so engrossed in the immediate mission as to fail to return to their major mission at the earliest opportunity. The tendency to follow a temporary and minor mission too far must be overcome at all costs for unless it is one's strength can be utterly expended on minor forces without in the least influencing the general trend of the battle. Subdivisions of a fleet must fight their way through any opposition tending to hold them from the main objective but they must never do so at the expense of that objective. Destroyers that can attack the main objective should never stop their attack to enter a melee with other destroyers or light forces trying to hold them off; light cruisers covering a destroyer attack should never stop to engage enemy light forces that cannot break up the attack unless such light forces are threatening their own capital ships; battle cruisers should not forsake a grip on the enemy battle line to drive off light cruisers unless such light cruisers threaten to break up the systematic attacks being made on the enemy line. These just stated minor principles are but a few examples of the many that have arisen from forces losing sight of the primary objective in battle but they are sufficient to press home the idea that losing sight of it may cost a commander his opportunity to deliver the decisive blow. To prevent such occurrences all commanders in a fleet must always know what the primary objective is and keep before them the fact that nothing they do will count

for much if it draws them from that objective before it has been gained. When, as always happens in battle, an enemy force stands in the way of reaching the primary objective that enemy force may for the time become the immediate objective, but rarely for long. As soon as the way to the primary objective again becomes open, the immediate objective has been gained and no time should be lost in dropping it and going on to the key of the enemy strength, his battle line. If in his battle tactics each commander in a fleet keeps this idea to the fore he will at least do his maximum toward bringing victory, for success in battle hinges on knowing the objective, - the right objective for the instant, and going for it.

Offensive versus Defensive Tactics.

There is usually only one successful way of going for the objective in battle and that is the offensive way. In a sea battle unless a fleet is forced to a defensive attitude by the necessity of protecting something, as for instance a train, defensive tactics will never bring decisive victory. When guarding a train, even though the dispositions may be defensive, victory may be obtained by using offensive tactics from them. Therefore, a commander of a fleet or any part of a fleet, as soon as his objective of the instant becomes evident, must go for it and gain it in the offensive way. So going, the commander at once seizes the initiative and putting his enemy on the defensive by compelling him to conform to his movements, he takes the first step that will ultimately enable him to gain

"superiority at the point of contact." Let us never forget that though defensive tactics sometimes prevent defeat, only by offensive tactics can a decisive victory be gained.

Conditions and Elements that Influence Tactics.

While here and there reference has been made to them there are certain things that influence tactics in such a vital way that close attention must be paid to them from the very earliest to the closing moments of battle. These points and the bearing they have on tactics will now be discussed under the headings (1) The weather, guage, gas, and spray; (2) Roll and pitch; (3) Light, sun-glare, silhouette; (4) Surprise; (5) Time; (6) Smoke and smoke tactics, and (7) Preparation before battle. Knowing how these things may effect results in battle, a commander must at all times take cognizance of them in his tactics and give their advantages and disadvantages due consideration in every move he makes.

The Weather - guage, gas, spray.

It is a generally accepted rule that the weather guage gives one the advantage in a modern sea battle and looking on the fleet as a whole this is probably true. But it is not always true for any single part of the fleet. The advantage to a fleet as a whole comes from the fact that having the weather guage its torpedo craft, close for attack with the wind and sea rather than against them, thus retaining their speed, while at the same time the fleet can make effective use of smoke screens not only to cover its own attacks but also to protect any of its threatened

parts. Thus the weather guage offers possibly decisive advantages both for offense and defense. But this is not always its only advantage. If the wind is strong the spray both from sea and from shells that fall short, blows toward the leeward ships and materially slows their rate of fire, an advantage of no small importance. On the other hand ships having the weather guage suffer greatly from the interference of their own smoke and funnel gases, sometimes to such an extent that they lose much of their own gun fire while the enemy retains all of his. Hence while a commander-in-chief will almost invariably seek the weather guage for the action as a whole, minor commanders when they have a choice must weigh the spray against the gas penalty and select the position that will be the better for them. It will not do to always seek the weather guage.

Roll and Pitch

Another element resulting from weather conditions, and which may have a very considerable effect on the results of battle, is "roll and pitch". Superiority in gun hitting being practically the deciding factor in battle all tactics are based on it, and roll and pitch seriously interfere with hitting. He who can engage on courses that give his own ships the minimum roll and pitch will at least not lose hits on that account. In any event he should not accept a roll and pitch penalty without at least forcing an equal one on the enemy.

Sun-glare, Silhouette, Light.

Before the day of telescope sights and colored lenses another element interfering with gun pointing was sun glare, and until recent years sound tactics always required one to obtain and keep the "sun gauge", especially if the sun were low. In recent years, and more particularly in the late war, the sun gauge has been found distinctly disadvantageous for not only have colored lenses nullified the glare, but also, because of the great ranges used, ships with a bright horizon behind them make much better targets for spotting than those having the darker background. It is believed that the decisive results of Coronel and the superior fire of the Germans over the British Battle Cruiser Fleet in the early stages of Jutland were both due to the silhouette of the British ships even before the sun had set. Hence imposing the sun glare on the enemy, which at best may have but little effect, is of doubtful value while the danger of silhouetting one's own ships in so doing may prove decisive. Therefore the sun gauge should be avoided rather than sought even though it may be possible to nullify the effects of silhouette by throwing a smoke screen behind ships having the sun gauge.

Surprise

In tactics as in strategy no one thing has more far reaching effect than the element of surprise. A commander whose tactics contain the surprise element stands to make great gains thereby since catching an enemy when unready to ward off a blow makes it possible to inflict great damage that may even be carried through to decisive victory. So great is the danger from a sur-

prise attack that the safety of a fleet demands at all times a disposition that will make a major tactical surprise impossible, and such a disposition has already been indicated in our discussion of the approach. In spite of such dispositions, in war each fleet always endeavors to get some of the advantages of a major tactical surprise by coming up on the enemy fleet in a way not expected even though a complete tactical surprise rarely occurs. However the possibilities of surprise do not end with major surprises for one at any stage of the battle, even if brought about by a comparatively minor force, may be sufficient to give a decisive turn to the whole battle. Any sudden maneuver that enables a commander to hit the enemy a heavy blow when that blow has not been anticipated has the nature of a surprise and this should be remembered by all minor commanders. Destroyers attacking from a smoke screen, a submarine attack, a sudden closing of the range, an unexpected concentration of fire, and a heavy air attack in force are all examples of minor tactical surprises that may bring tremendous results. And just as it is strong in offense, a tactical surprise has great possibilities for defense as was shown by the Germans in their "ships right about" maneuver in the Battle of Jutland.

There is no possibility of indicating the infinite number of ways in which the element of surprise can be injected into battle tactics. Surprise sometimes becomes possible as a result of visibility conditions, whether unavoidable or created intentionally, but more generally it is obtained by taking quick advantage of some situation brought about by the maneuvers of battle. Hence all that can be laid down about it is that

commanders must be ever on the alert for opportunities to use it, and when they see an opportunity must take advantage of it at once.

Time.

In battle, once a fleet begins to reduce the relative strength of an enemy, that enemy's loss of remaining strength multiplies rapidly. Hence, other things being equal, the fleet that can hit hard first has made a long stride toward winning the battle. Time therefore becomes a most vital element and makes it imperative that every force strike at the main objective at the earliest possible instant after the heavy forces engage. It is not sufficient that a force knows what to strike and how to strike it. It must also strike in the absolute minimum of time and with its utmost strength. Any commander who fails to keep the time factor in mind, and delays his attack on the main objective beyond the earliest possible minute it can be delivered, is risking the success of the whole battle. In tactics as in strategy "Time is everything".

Smoke and Smoke Tactics

The introduction of steam driven ships effected tactics in many ways some of which have been touched on in an indirect way. While the broad fundamental tactical principles of old days remain as sound as ever, new motive power has caused many changes in minor tactics, the results of added maneuvering ability, speed, etc. But one of the more recent developments arising from mechanical driving devices has come from their making smoke. We have already discussed the effect on tactics of gun and funnel gases because of

their interference with gun fire, and smoke in its commonest form is a funnel gas. But smoke has another bearing on tactics in that it can be made a mantle of invisibility, and because smoke can be made at will this attribute has come to play a vital part in battle tactics.

To a force driven to a defensive status, ability to make and hide itself in or behind a screen of smoke is of tremendous value. Possibly no other defensive measure can so quickly and successfully save a force from punishment as a smoke screen properly thrown between it and the attacking force. Similarly a force that can advance under the cover of a smoke screen has a splendid opportunity of doing so with the maximum immunity. Again it is frequently possible to cut off the support one part of an enemy fleet is giving another by putting a smoke screen in front of that part and blanketing it. As a defense against air attacks the value of smoke has not yet been fully determined but it is probable that just the ordinary smoke of battle will greatly handicap air forces. What purposely laid smoke can be made to do them can only be surmised but it seems possible that it can be developed into an effective defense against such attacks. These and other uses of smoke in battle show its enormous tactical possibilities, and special devices for making it having been developed for the use of air craft as well as surface craft, and may be developed even for submarines, all commanders must make special study of the use of smoke, and their tactics must be such as to take advantage of it to the fullest extent both for offense and defense.

But great as are the possibilities of success arising from the proper use of purposely made smoke in battle there are grave dangers arising from using it carelessly, for smoke moves with the winds and once launched there is no controlling it. If carelessly laid, a smoke screen may cut out of action a part of one's own fleet at a time when the hitting power of that part is absolutely essential to safety or success, and hence though commanders must know and use smoke tactics they must use them with discretion lest they be hoist by their own petard. But as has been the case with other things bearing on tactics we can give no definite or fixed rules concerning the use of smoke. When to make it and when not, and how to use it when made, can be determined only on the field of battle where the multitude of factors operating at the instant can be taken into consideration. But knowing the possibilities smoke has for good and evil it is apparent that any commander who may go into battle must make a study of "smoke" and must use it, as far as it may be advantageous to do so, in all his tactics.

Preparation before Battle.

The several points we have just discussed as having a decided bearing on the tactics to be employed are points that must be considered in and applied during battle. There are many other things upon which success in battle depends but which though given their actual test in battle must be provided for long before it. In fact no battle tactics can succeed unless these things are fully developed beforehand, and because they are so vital to the success of battle tactics we cannot omit to mention them as being the things

a commander must look out for before he enters battle. The points particularly referred to are (a) Perfection in ship handling, (b) Excellence in gunnery, by which is meant accuracy and rapidity in the use of all weapons, (c) Readiness of the material to stand up under all strain, (d) Knowledge of the general plan and the part each unit is to play in it, and last but not least (e) Such a will to win that nothing short of complete victory will be accepted. Only when a fleet has these things is it ready to enter battle, but, after entering, it can win only by employing sound tactics which to a large extent are based on the principles already deduced or discussed.

The "follow-up."

Having been thoroughly prepared for battle, and employing sound tactics in it, a fleet has every prospect of gaining its primary objective, the breaking up of the enemy battle line. When that has been done the decisive point of the engagement has been reached. But having reached it, what remains to be done to turn the success gained into a decisive victory?

As soon as any fleet finds the center of its strength breaking, it cannot but realize that to continue on as it is then going means only greater disaster. When this point has been reached the fleet naturally will attempt to withdraw from the action and when it does, the final phase of the battle opens. If a weakening fleet can withdraw successfully, the battle, even though lost, may not be decisively lost, and though the other side has won a victory it will not be a decisive victory. It is therefore

apparent that though the decisive point in battle comes in the engagement phase, the decisiveness depends on the follow up stage. Hence commanders must devote as much attention to the "follow up" as to any other phase of battle, employing tactics in it that will save their fleet if being defeated, or if winning, that will complete the destruction of the enemy.

As to what tactics the retreating and following fleets should employ in this phase of battle nothing definite can be stated. The one fleet attempts to conceal itself and avoid action as much as possible while seeking a safe refuge, while the other attempts to come up with it and defeat it as a whole or in detail. In general both sides endeavor to follow the tactical principles already laid down whenever contact is made, but the one does so by fighting rear guard actions in a defensive manner while the other constantly attacks. In this phase, history seems to indicate that the following fleet has the more difficult role to carry out successfully. Aided by the inevitable smoke of battle as well as by smoke screens purposely made, strengthened by the initiative in attack that to a certain extent results from retiring tactics especially in the use of destroyers, submarines, and mine laying craft, and often covered by the darkness of night, a retreating fleet has usually been able to get away. However it seems probable that such a result comes less from the strength of retreat than from the fact that winning fleets have not prepared themselves as they could and should have for carrying out this phase of battle. Possibly the greatest drawback to success in it lies in the fact

that the Commander-in-Chief usually places himself in the battle line, and going through the battle line finds himself without the facilities for reorganizing his fleet for the change in the operation. But whatever the cause may be, certain it is that modern battles between large fleets seldom result in decisive victory since when one fleet decides to withdraw from battle the other is either unable or incompetent to "follow up" successfully. In view of the vital effect this stage of a sea battle may have on the result of the war as a whole, much more attention must be paid to it in the future than it has received in the past. It requires a general plan just as the engagement phase does though the tactical principles governing it merely continue from the preceding stages.

I have now completed the reading of the War College pamphlet on The Naval Battle and through it hope to have refreshed your memories as to the general plan and tactical principles under which the United States fleet may have to fight a battle. I hope also that through the plan and basic principles having been presented as they have been you are now impressed by these facts:- first, that if any subdivision of the battle team fails in the task assigned to it the battle may not only not be won but may be disastrously lost; second, that to perform its task successfully each subdivision of the battle team must in itself be a team highly skilled and trained in the special work peculiar to the type of ships that compose it; third, that only by perfect

coordination and team work between the type teams is there any reason to hope for a victory in battle for the fleet team, and fourth, that all of us officers have a tremendous work before us to develop our fleet team and our type teams to the extent necessary to insure their being invincible in battle.

That the plan discussed is complicated we must admit, but taking into consideration the number of types of ships and weapons found in the fleet it is comparatively simple. It is not just a War College plan, although the War College has had its influence on it, but is the plan of battle indicated for the fleet in the War Instructions. Its strength has been demonstrated on the game board every time sound major tactics have been employed in carrying it out. It is evidently similar to the plans of other nations since both the Germans and British followed it at Jutland although neither of those fleets used it in that completeness we have adopted. It is so apparently sound that the War College is basing its entire tactical training for high command on it. Since it is the official plan laid down for the fleet in the War Instructions it is the one the Fleet must prepare itself in every detail to carry through to decisive victory.

Few if any officers question the fact that the course in tactics at the College is of material assistance to the Fleet in that it tends to provide for it high commanders trained for and to some extent practiced in the sound major tactics so essential to the carrying out of the plan. This of itself brings the Tactics Department of the College to a close relationship with the Fleet.

But there can and should be a much closer relationship between them for even though high commanders become skilled and practiced in sound major tactics through the training they have had, and can still get by the War College methods, nevertheless that training alone will not make the Fleet win battles. The employment of sound major tactics merely makes the winning of battles possible, it is by the excellence of the minor tactics used by the subdivision of a fleet in battle that battles of today are to be won. In that fact lies the necessity for a closer relationship between the fleet and the Tactics Department or at least between the fleet and the methods the Tactics Department represents, for without the other neither can make much progress in the development of the sound minor tactics a fleet must use to win.

Let us get clearly in our minds just what is meant by minor tactics and why they are so vital to the success of the fleet as a whole. By minor tactics in the sense used in this paper is meant those tactics a subdivision of the fleet uses in carrying out its task under the general plan. Having a general plan the major tactics of the high commander places the parts of his fleet team in the positions from which he intends they shall carry the plan through. His major tactics may even cause him to direct a force when and where to attack. But at that point in battle direction by the High Commander practically ceases and thereafter each particular force operates under the guidance of its own commander doing what its part in the plan calls for following its own methods, doctrines, and minor tactics in doing it. The extent to which each force succeeds depends absolutely on the soundness of

the minor tactics it employs and the extent to which it has prepared itself to carry them out. If every force has sound and complete doctrines laid down clearly and concisely where all may read and understand them, and if those forces have trained themselves thoroughly in the tactics flowing from those doctrines, each force will probably succeed in carrying out its part in battle and the fleet will win and win decisively. But if the subdivisions, or even any one of them, have not their doctrines, are not indoctrinated, trained, and ready, the whole arch of the battle structure will fall and not only will the decision not be won but possibly overwhelming disaster will come to our fleet and to our country.

Therefore the minor tactics used by each force in the fleet becomes vitally important. This has long been recognized as regards the battleships, so much so that the principles governing battleship minor tactics have been fully laid down in the "War Instructions". But what about the other forces whose influence on the outcome of the battle is just as great as that of the battleships? Where can we find laid down a full exposition of the principles they are to follow in battle? Do even those forces themselves know all those principles and can they carry them out? That the battleships have their instructions is very well but it doesn't begin to be enough to make our fleet capable of winning a battle. To do that each member of the fleet team must have as full and complete a doctrine as the battleships now have. We need them for cruisers, for destroyers, for submarines, for fast mine layers, for anti-submarine craft, and for air craft and their carriers. Until we have them our fleet will not be a

battle fleet team but only a battleship team. Until we have them we cannot give our officers reasonably sound training even in major tactics much less can we expect them to carry sound major tactics to the field of battle.

Let no one get the idea that the Navy is entirely without doctrine of combat for every member of its fleet team except battleships. There is some sort of doctrine extant for each of the types though not all have codified such doctrines as they have and published them. At best none of the other types have anything that can be compared for completeness to the battleship instructions although of all types the battleships probably require the fewest and simplest instructions since battleships never have but their one role to perform. Of the other types of craft, the destroyers have probably gone furthest in the development and codifying of their minor tactics for both in the Atlantic and in the Pacific the Destroyer Forces here for several years been working systematically and diligently to that end. They are gradually building up and giving to the Navy for destroyers, instructions that when finally completed will be worthy to go with those the battleships have. However, so far, the college has received but little of similar nature from other forces except submarines and it assumes that the other forces are not proceeding as rapidly along that line as the destroyers and submarines are. What the destroyers and submarines have accomplished so far has not only made them much more nearly ready to take their place on the fleet team but has aided the College tremendously in giving to its

students correct methods for handling those types in battle. In view of the vital importance of minor tactics is it not possible for every type to develop and enunciate their minor tactics as the battleships have done and as the destroyers and submarines are doing?

You may say, "But we have had battleships for centuries, that the battleship instructions represent the work of those centuries, and that ultimately the tactics and instructions for other types will be developed just as fully. Give the other types a chance and they too will come through". All of that is true, but let us not forget that during the development of the modern battleship and our instructions for them, we have learned a great deal not the least of which is the fact that it is possible to carry on war contests in miniature and from such miniature contests learn things that until very recently could be learned only in actual war. We have found that by coupling contests in miniature with tryouts at sea even under peace conditions, we can learn things that cannot be learned in any other way, and can do, in a few years for the tactics of any type all that it has taken centuries to do for the tactics of battleships. To a greater or less extent every force in our fleet is now going about its work that way and that fact must please all of us. But the purpose of this paper is to clarify the process in the minds of all and to possibly stimulate more rapid progress in it.

You may ask why the College doesn't do for minor tactics as much as it does for major tactics and why the College doesn't formulate complete instructions for each of the types not having

them. The reason the College doesn't attempt that work is because what it would turn out would be purely theoretical and would undoubtedly fail completely in practice. It takes not only the most expert and practically all of the experts in any type to develop the tactics for that type, but also even when those experts attempt the work they must have their ships available to actually test out many of the ideas presented before even they can decide which are the best and will stand up under the conditions of service. The College has neither the experts in sufficient number nor the ships with which to carry on the work, those being found only in the forces themselves. Hence the forces themselves must do the work of developing their minor tactics. However in doing that work the forces come to know and understand their doctrines as fast as they are adopted, so as the work progresses they actually prepare themselves for battle and by the time the doctrines are completed the force has become trained and ready to carry them out. As proof of this it is but necessary to recall what our battleship force is today and has been ever since it first completed its instructions. There will be still further proof of it when the destroyers and submarines complete their even more difficult instructions in the near future at which time they will not only have their instructions but will be trained in them. By taking up and following the line of procedure of the destroyers every subdivision of the Fleet, within a reasonable time, can prepare its own instructions and become trained to carry them out, and it is in helping the Fleet to do this work that the College becomes most closely related to it.

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In order to carry out their work in this direction both destroyer forces made use of the College, its methods, its appliances, and its rules. Having obtained from the College such material as they could not supply for themselves they started playing out battles on their game boards but with this difference from the College view point. While at the College the primary study is in major tactics, and minor tactics enter only as they effect the major tactics, in the Destroyer Forces the major tactics are secondary and used only to the end of enabling the destroyer officers to develop their minor tactics along the right lines. To them the general result of the game is of vastly less importance than what the destroyers do to win or lose the battle. When by trial in games a tactical idea is found to be worth using, the Destroyers, if they can, try it out in practice and when there proved sound they adopt it and incorporate it in their instructions. As all officers holding command positions in the destroyer forces are required to be present at and take part in the games, which are held at sessions of what they called their "Staff College", these officers not only receive the practice and training in tactics that the games afford but at the same time every one is continuously familiar with the development of destroyer attacks as far as they have gone. But this is not the only thing they are getting out of it. Officers learn to estimate the situation and reach sound decisions; they learn to write and read campaign orders; they become familiar with the tactics of all the fleet and especially with those of the battleships which for them are the center of operations; they learn

the signal book and how to use it; they learn things about radio and what they can and cannot do with it in battle; they learn the initiative they must show in carrying out battle orders; and they learn many other things too numerous to mention. What they have is a War College exactly on the same lines as this college except it deals primarily with their minor tactics rather than with major tactics as this College does. In other words, they have the Tactics Department of this college in its true relation to the fleet and by so having it they are not only preparing the instructions so necessary for their force but at the same time they are training officers for their work and their force to carry out its task in battle.

Although the original reason for establishing a Staff College in the Atlantic Destroyer Force was for the purpose of developing the War Instructions for that force, it was later found that only through it would it be possible to keep the Instructions up to date, and the officers of the force trained to carry the instructions out. It was found that if a force after it once gets ready is to continue to be ready to do its part in war, that force's War College would have to continue to operate for in no other way than by practice in miniature can the fleet or any of its parts be kept ready for the team work of battle. (Hence the War College and the Fleet are inseparable. If the Fleet as a whole and each force in the fleet will but recognize that fact it will not be long before we will have a fleet team and force teams that will always succeed in battle. But until the Fleet and each force in it incorporates the College, or rather the methods of the College, into its system of training, it is hard to see how it can carry through the complicated plan of

battle laid out for it or bring to our country that decisive victory it has pinned its faith on you and me and the fleet to attain. With the way to do it so clear to us and with the welfare of the country at stake, should we as naval officers fail to bring the War College into its true relationship to the Fleet and incorporate its methods into the training of the Fleet for Battle?

DIAGRAM IX.

A FLEET DEPLOYED (NORMAL VISIBILITY) OPENING FIRE.

