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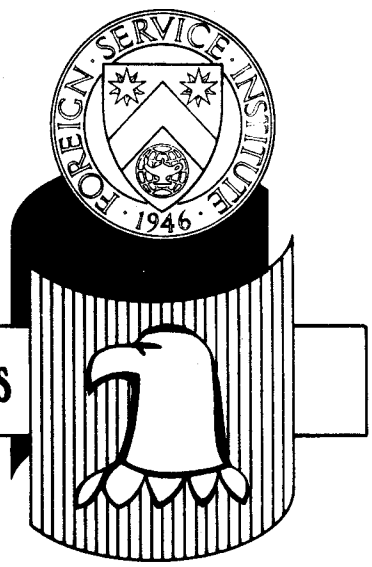
U.S.M.C. AMPHIBIOUS OPERATIONS; YEAR 2000



TWENTIETH SESSION

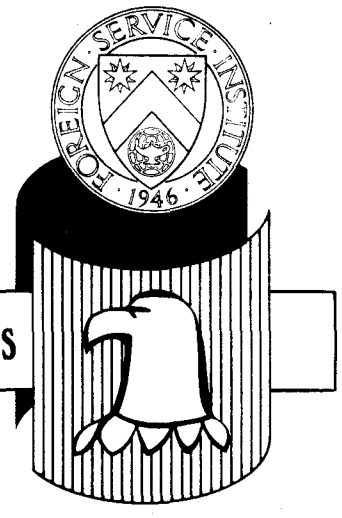
EXECUTIVE SEMINAR IN NATIONAL AND INTERNATIONAL AFFAIRS

DEPARTMENT OF STATE

1977-78

U.S.M.C. AMPHIBIOUS OPERATIONS; YEAR 2000

Case Study by DONALD J. NORRIS, Colonel, USMC



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MARINE CORPS AMPHIBIOUS OPERATIONS;

THE YEAR 2000

by

Colonel D. J. Norris, USMC

SUMMARY

There has been considerable talk of late about the future, and particularly, the year 2000. Two thousand seems to be a magical number that easily attracts attention. Perhaps this is so because in just a few short years (22) we will move into the 21st century. This is the century depicted so often in science fiction books as the one promising interplanetary space travel and the establishment of the cities on the moon. Amphibious planners must also look into the future for that is where the wars will be won or lost.

This case study of amphibious operations travels the road from the present to the future. It begins with the premise that there is a vital need for this country to have a forceable entry capability from the sea. From this starting point, the study explains the organization of the Marine air-ground task force and reviews the present concept of amphibious operations. Next, the long-range period from the present to 1995 is examined, and it promises to be an exciting one with new air-cushioned landing craft and assault vehicles capable of skimming across the water at speeds up to 50 knots. This era, because of an improved and faster means of moving troops and equipment from the ships to the shore, also makes it possible to extend beach frontages which, in turn, promote operational flexibility. This will present a potential enemy with even more areas of his coastline to defend. The study provides not only the details of the new landing craft and assault vehicles but takes a look, as well, at the new tactics that have evolved in anticipation of their employment.

Before the study predicts what the future holds for amphibious operations, a quick appraisal and forecast are made concerning problems the world will be faced with in the year 2000. The areas of overpopulation, diminishing resources and food supplies, plus an impending energy crisis, are looked at from the standpoint of what effect, if any, they will have on world conditions, the year 2000.

Finally, Navy and Marine Corps planners are taken to task for not facing the inevitable fact that surface shipping, as we know it today, will not be capable of surviving in the 21st century. The study proposes a new class of amphibious ship, the submarine, with embarked Marines, or Sub-Marines, aboard to form the assault echelon of tomorrow's amphibious task group. The submarine not only provides the mobility and surprise required for amphibious operations, but more important, it can survive attack by enemy nuclear munitions, cruise missiles and precision-guided anti-ship missiles.

The United States must have this capability in order to protect its world-wide interests in the years to come.

Executive Seminar in National
and International Affairs

April 1978

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I

INTRODUCTION

> My interest is in the future because I'm going to spend the rest of my life there.
>
> C. F. Kettering

There comes a time, perhaps only one, during the span of a lifetime or a career when the opportunity presents itself to do some serious crystal ball gazing. The modern term for this form of malaise is titled futurism. The opportunity has presented itself to me this year in the form of a personal challenge to write a case study on U. S. Marine Corps amphibious operations, the year 2000. It might be presumptuous on my part to even begin to believe that what will unfold in the next twenty-five or so pages is even close to being what the world, in the year 2000, will behold for the Marine Corps, not to mention amphibious operations. After all, there are literally thousands of organizations with large and learned staffs that are interested in futurism. "A university survey group has concluded that there are now more than 3000 courses offered in futurism in the United States alone; the Washington, D. C.-based World Futures Society now boasts 20,000 dues paying members, and just one company that does futures research has several more than 500 corporate and government clients to date. Futures research has become a multimillion-dollar-a-year growth industry - despite the fact that it produces goods no more durable than forecasts, alternate images of the future, and carefully extrapolated statistics on the year 2000. The Library of Congress has estimated that close to 100 private research institutes and DoD think tanks in the United States alone are involved in some aspect of futures research."1/ The majority of the reports or research papers produced by futures research groups are never seen or become locked up in some dusty file room. I would hope this fate does not befall this paper. By the use of a case study I will attempt to join, for a brief interlude, the ranks of the futurists. In doing so I may never come close to producing a work that can compare with the Rand Corporation's famous "Delphi" projects. However, by using the experience gained throughout my career, and of late with the Executive Seminar, I will attempt to portray my thoughts in writing on the way things might look for amphibious operations, the year 2000.

In order to establish credibility for amphibious operations, I will initially examine the feasibility of the United States to maintain an amphibious operations capability into the 21st century. Upon establishing this capability as a premise, I will elaborate on the Marine Corps air-ground task force organization, as well as the present-day concept for the conduct of amphibious operations. After this initial stage setting I will explore the long-range period (1985-1995) by looking at the present findings of Marine Corps Advanced Amphibious Study Group. At that point, I will move into the year 2000, looking at certain important factors; e.g., population, resources, food and energy, that I feel will have a cause and effect on world problems and influence Marine Corps thinking, come the year 2000.

To start with, I'd like to submit the following as a means of explaining to the reader why this country has a continuing need for an amphibious

capability. As a means of illustration, if we go back in history to study the grand strategy of the once mighty Roman Empire, we will see that "it found that the use of money and a manipulative diplomacy, while keeping its forces visibly ready to fight, but held back from battle could serve to contrive disunity among those who might jointly threaten the empire, to deter those who would otherwise attack, and to control lands and peoples by intimidation ideally to the point where sufficient security or even an effective domination could be achieved without any use of force at all." 2/ Some 2000 years later, in effect, isn't this what this country is trying to achieve? - i.e., a strong military posture throughout the world. I believe the Soviets have this in mind also. What better means for the U. S. to accomplish this task than the projection of power. We must not lose sight of the fact that we are and have been a maritime insular nation tied to the sea and reliant upon the sea for communication with our free world allies and trading partners. These interests are critical to our economy and defense. They must be protected if we as a nation are to maintain the image of a superpower. Unfortunately, there is a new and highly competitive superpower whose rising star is already on the horizon - the Soviet Union. The Soviets also are competing for the role of world leader. The Soviets and their Cuban allies' recent intrusions into the Southern flank of NATO will make it doubly important that we maintain a strong Navy and Marine Corps amphibious forceable entry capability. As an example, since World War II there have been some 200 major crises situations of which the Navy and Marine Corps have participated in 177. There have also been 30 serious crises during the same period and Marines have participated in 21. The world situation will not get any better during the next few decades; in fact, as I will point out later in the study, it holds a great potential for getting worse.

Because of the unique character of the sea being an international body of water, naval forces can operate in an entirely different manner from prepositioned U. S. ground and land-based air forces. In any situation short of actual hostilities, naval forces, with their attendant Marine air-ground task force, can be positioned in international waters in the vicinity of a crisis, ready to respond by launching either air strikes or landing forces, but without having to request overflight or landing rights or violate the sovereign rights of any nation. In addition, the embarked Marine air-ground task force needs no port facilities or airfields to sustain its assault. It comes prepared to fight with armor, artillery, engineer and logistic support.

Our decision to deploy our naval forces in a forward posture assures the defense of NATO and provides the Supreme Allied Commander Europe, General Haig, with the capability to defend the flanks of NATO. This flexibility that is inherent with naval forces gives the President the means to respond to the degree appropriate to our aims, not only to the defense of Europe, but to protect our vital interests in the Pacific and Indian oceans. This capability will become even more important in the event of an energy crisis.

Now that we have agreed (hopefully) that there will be a need for amphibious operations in the future, I would like to take time to give recognition to those agencies that were helpful to me during the research phase of this case study:

Head of the Marine Corps Advanced Amphibious Study Group
Marine Corps Development and Education Command
Quantico, Virginia

Head, Amphibious Ships, Requirements Branch
Headquarters, U. S. Marine Corps
Washington, D. C.

Center for Naval Analysis
Washington, D. C.

Head, Studies Branch
Research, Development and Studies Division
Headquarters, U. S. Marine Corps
Washington, D. C.

II

MARINE AIR-GROUND TASK FORCES

A study of amphibious operations must first examine the organizational structure of Marine air-ground task forces or those Marine Corps forces that comprise the Amphibious Task Force. "These forces consist of the Marine Amphibious Force (MAF), Marine Amphibious Brigade (MAB), and Marine Amphibious Unit (MAU)." 3/ These forces are combat-task organized and consist of four elements:

Command Element
Command Combat Element
Aviation Combat Element
Combat Service Support Element

The term task organized simply means that there is no totally predictable force mix that can be associated with any of the Marine air-ground task forces as organized for combat. These forces are tailored to perform a certain combat task from Marine units, both air and ground, that are trained, equipped and ready to be integrated into any of one of the above-mentioned organizations. That is to say, there is no "force packaging" or firmly set numbers that make up the air-ground task force concept.

The four elements that were mentioned earlier are designed to perform certain tasks. The command element consisting of the commander of the air-ground task force is provided with an integrated staff and communication facilities to enable him to exercise command of air-ground operations. The headquarters is structured for the conduct of operational functions and is tailored to the mission and task organization of the air-ground task force. Within the task force, principal reliance is placed on direct liaison around the major elements to achieve the necessary coordination of air and ground operations. The capabilities of the air-ground task force headquarters extend and complement the capabilities of the headquarters of major elements of the task force, but do not duplicate them under normal circumstances. Staff services to the commander are oriented principally toward matters which affect the entire task force.

The Ground Combat Element is a task organization tailored for the conduct of ground maneuver. It is constructed around a combat infantry unit (division, regiment or battalion) and it also includes appropriate combat support and combat service support units. Under normal circumstances, there is only one ground-combat element in a Marine air-ground task force. A requirement for two ground-combat elements may occur in certain situations. Exceptionally, three ground-combat elements may be necessary. When there is more than one ground-combat element in the task organization, the commander of the Marine air-ground task force directs and coordinates ground maneuvers. The capabilities of the separate air-ground headquarters must be consistent with the increased span of control and the command and coordination requirements.

Normally, there is only one aviation combat element (wing, group or squadron) in a Marine air-ground task force, although in certain circumstances two such elements may be required. This element is task organized tailored for the conduct of tactical air operations. It includes those

aviation command (including air control agencies), combat, combat support and combat service support units required by the situation. These capabilities are provided from the varied aviation resources of a Marine aircraft wing and appropriate force units. Usually, both fixed-wing attack and helicopter aviation capabilities are included in the aviation combat element of a Marine air-ground task force. Air operations of the Marine air-ground task force are conducted under the principle of centralized control at the level of the task force.

The Combat Service Support Element supports both the ground combat element(s) and the aviation combat element(s). Other combat service support units may be grouped in this element for organizational efficiency, although they may support only one of the other major organizations of the Marine air-ground task force. In certain situations, two combat service support elements may be necessary. Particularly in larger Marine air-ground task forces, the character and magnitude of operations and the area of operations may make appropriate the formation of an engineer support group, in addition to a logistics support group.

Now that we've talked about the functions of the various elements of the Marine air-ground task force, let's look a little closer into the composition of these forces for combat starting with the MAF. The MAF, largest of the Marine air-ground task forces, may be formed with many variations in task organizations structure. Variations range from one Marine Division, one aircraft wing, to two reinforced divisions and two aircraft wings, together with appropriate combat service support organization. This particular force mix could number close to 50,000 Marines and Navy personnel. The MAF is commanded by either a major general or a lieutenant general, depending on its size and mission. It is capable of conducting a wide range of amphibious assault operations and sustained operations ashore. It can be tailored for any intensity of combat and to any geographic environment. A MAF may include an organic MAB or MAU as a separate element in order to conduct air-ground operations separated sufficiently in space or time from other MAF elements, or temporarily utilize an in-being cohesive MAB or MAU when the MAF is a follow-on force. Such operations involving a separate MAB or MAU would normally be of limited duration.

The next air-ground task force is the MAB. The MAB is a task organization that may be formed from two Marine battalions and two Marine aircraft squadrons to five battalions and five Marine aircraft squadrons. The personnel assets of a MAB could number approximately 19,000. It is normally commanded by a brigadier general and is capable of conducting air-ground amphibious assault operations in low and mid-intensity environments. During potential crises situations, the MAB may be forward deployed afloat for an extended period in order to provide immediate response. Under these conditions, MAB combat operations may be supported from the seabase, facilities ashore, or a combination of the two. The MAB is normally organized to accomplish a mission of the limited scope. Each division/wing team has the capability to deploy two MABs for separate missions should unusual circumstances require such flexibility. The command and control assets required to support such deployments would, however, preclude deployments of a third MAB. Accordingly, subsequent deployments from that division/wing team would have to be organized either for augmentation of one or both of the deployed MABs or for amalgamation of all remaining division/wing assets with one or both of the MABs to form a MAF.

The smallest of the air-ground task forces is the MAU, numbering around 1500... The MAU is again a task organization which is normally formed from a Marine battalion and Marine aircraft squadron. It is usually commanded by a colonel and is capable of performing combat operations of relatively limited scope. The MAU is the air-ground team organization that is employed to fulfill routine afloat deployment requirements; e.g., with the 6th Fleet in the Mediterranean, the MAU provides an immediate reaction capability to crisis situations and, when committed, is normally supported from its seabase. The preplanned coordinated tactical employment of two MAUs simultaneously in a single combat mission is not contemplated since a combat mission of this scope would normally require the initial assignment of a MAB. In exceptional circumstances, a MAU may be a component of a larger Marine air-ground task force for a limited period, as mentioned above.

The principle units that comprise the various Marine air-ground task forces also bear mentioning in some detail. "The Marine Division (17,000 personnel) consisting of a Headquarters Battalion, three Infantry Regiments, Reconnaissance, Engineer, Medical, Shore Party Motor Transport and Service Battalions, plus an Artillery Regiment. The Division has a primary mission to execute amphibious assault operations." 4/ The Artillery Regiment's primary mission is to provide fire support to a Marine Division in the amphibious assault and subsequent operations ashore. The Artillery Regiment has 18 15MM towed howitzers and 54 105MM howitzers in its fire power inventory.

The Marine Infantry Regiment (3500 personnel) of the Division provides the nucleus of Regimental Landing Teams (RLTs) and Battalion Landing Teams (BLTs). An RLT is a task organization for landing comprised of an infantry regiment combat support and combat service support elements, as needed for a particular operation. The number of maneuver battalions available to the RLT for landing may vary between two to five battalions and is determined by the scheme of maneuver. The primary consideration in forming the RLT is the determination of the support required for amphibious assault and for subsequent operations ashore. Depending upon the terrain, means of mobility, enemy situation, and assigned mission, units such as reconnaissance, artillery, engineer, tank, motor transport, or service may be attached to the regiment, as required.

The other part of the air-ground task force is the Marine Aircraft Wing (MAW). It is the highest level tactical aviation command in the Fleet Marine Force. It is a balanced task-type organization designed to provide all types of air support required in tactical air operations. The wing is comparable to a division in command responsibility and is commanded by a major general. It can support one or more Marine divisions in an amphibious operation, depending upon the mission of the landing force, the enemy situation and the characteristics of the area of operation. The MAW has three types of groups in its makeup: the Marine Wing Support Group that provides services and support includes Marine Corps property supply management and equipment repair for all MAW units; the Marine Air Control Group which operates and maintains the Marine Air Command and Control System and the Marine Aircraft Groups that operate the wing's aircraft squadrons, either fixed wing or helicopter. The aviation group is an administrative and tactical command. It is comparable to an infantry regiment in terms of command responsibility and is commanded by a colonel. The group has no table of organization. It is a task-type organization consisting of a command and administrative nucleus to which tactical

squadrons are assigned as required for operations and/or training. "The group normally represents the lowest aviation echelon capable of sustained independent operations with no outside assistance except for access to a source of supply." 5/ In addition to the groups that are organic to the MAW, it has a Headquarters Squadron, Photographic Reconnaissance/Electronic Warfare Squadron and an Aerial Refueler Transport Squadron. The mission of the MAW is to conduct air operations in support of the Fleet Marine Forces to include offensive air support, antiair warfare, assault support, aerial reconnaissance, including active and passive electronic countermeasures (ECM), and control of aircraft and missiles. As a collateral function, the wing may participate as an integral component of the Naval aviation in the execution of such other Navy functions as the fleet commander may direct.

In addition to the Marine Division and Aircraft Wing there is an organization called Force Troops that provides a pool of combat support units and combat services support units. These units are variously referred to as force units, force troops, and force troop units. They are made available to reinforce or support the Marine Division or Marine Aircraft Wing and to operate as part of Marine air-ground task forces. Each Fleet Marine Force (Atlantic and Pacific) has a force troop organization. See Diagram 1 for organization chart depicting Force Troop units.

The organization that is tasked to provide logistics support to the MAF is the Force Service Regiment (FSR). "The FSR is employed as the supply link between Marine Corps supply depots in CONUS and fleet logistic agencies and the landing force elements deployed in the objective area. In the execution of this function, those elements of the regiment which supply rapidly consumed items such as rations, fuel and ammunition may be landed early in the operation or even with the assault elements. Other supply elements are echeloned into the objective area to provide maintenance of Marine Corps material of the landing force, which is beyond the capability of the service organizations of the component ground and air units. It is capable of providing replenishable supplies in the objective area and of supporting the landing force with third- and fourth-echelon maintenance of Marine Corps material from bases outside of or within the objective area." 6/

As we have seen in the foregoing review of Marine air-ground task forces, the combination of combat, combat support and combat service support units are welded together to perform a specific task. The size of the force is dictated by the mission that it must perform. This gives the commander and his staff the flexibility needed to accomplish the mission. In concluding this chapter I think it's important to list the major weapons/combat densities of a notional MAF. See Diagram 2.

FORCE TROOPS

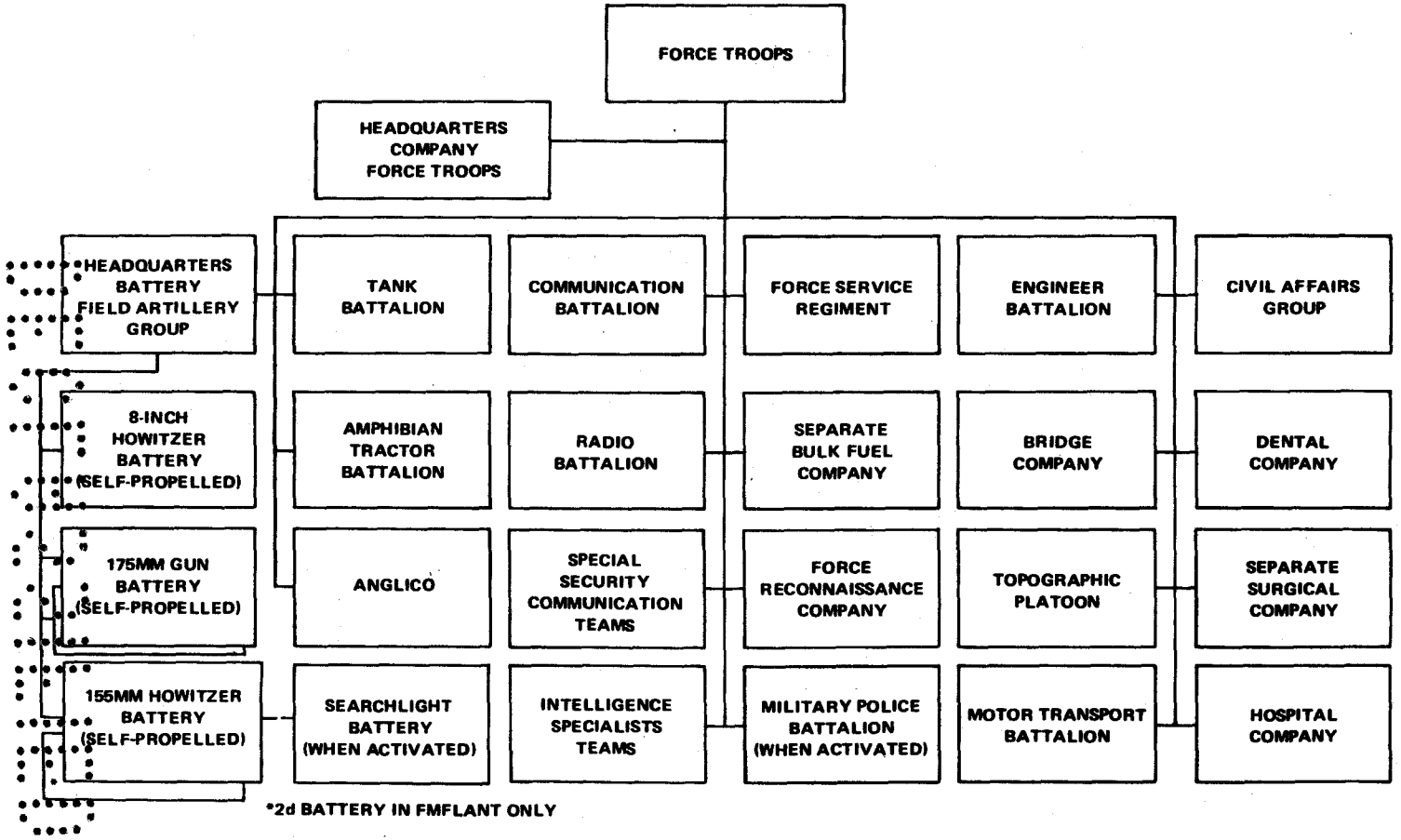

Diagram No. 1: Force Troops Units

	MAF 1/	MAF 2/
Tks	70	123
TOW	72	144
DRAGON	0 3/	288
Total	142 4/	555
Arty	102	120
LVT/APC	187	283
- Lift capacity	4675	7075
A/C		
- FW	140 6/	140
- Helo (ATK)	12	12
- Helo (TOW)	10	10
Total	162	162
- Helo (Transp)	114	114
- Lift capacity	4110 5/	4110

Footnotes

1/ Current capabilities of notional MAF (Reserve assets not used).

2/ Capabilities (using total active and reserve assets) will be available by 1980 to task organize two MAFs with densities for an armor heavy environment yet retain capabilities in the third active MAF and reserve DWT for low to mid intensity conflicts.

3/ Div currently has 72 106mm RRs that will be replaced by 288 DRAGON ATGMs by 1980.

4/ Total increases to 214 with addition of 72 106mm RRs.

5/ Lift capacity factors:

Veh	Capacity	
LVTP 7	25	*maximum combat troop
UH-1	11*	standard day.
CH-46	25	
CH-53	55*	

6/ AT ordnance delivered by USMC A/C

A/C	Ordnance
F-4, A-4, A-6, AV-8	Rockeye (MK 20)
F-4, A-4, A-6, AV-8	AP/AT (CBU-59)
F-4, A-4, A-6, AV-8	LGB (Mk 82, 83)
A-4	Walleye I, II
A-4	Laser Maverick
AH-1T	TOW (8 msl/A/C)

Diagram No. 2: Notional MAF Firepower

III

PRESENT MARINE CORPS AMPHIBIOUS OPERATIONS

Marine Corps Amphibious Operations are the result of years of testing and refining the state of the art sometimes under combat conditions to the point of where it is today. An amphibious operation is a complex maneuver requiring detailed planning, timely intelligence and planned logistics support. The key to the success of any amphibious operation rests in its surprise, flexibility and mobility. Picture, if you would, a theoretical enemy trying to defend against the likelihood of an amphibious assault against his shores. He must deploy large numbers of troops and equipment to meet a threat that has the flexibility to assault when and where it sees fit. This force can also assault during the hours of darkness and arrive in position within the amphibious objective area ready to conduct operations at the most inopportune time. To illustrate, a classic example of the fear that any amphibious assault brings to the enemy took place during World War II. During the early occupation of France by Germany, when the threat of an allied invation of France was minimal, the Germans had a total of 19 divisions deployed along the European/Mediterranean coast. This enabled them to concentrate their forces on the Eastern front. Later in the war when the tide of battle turned in favor of the allies and the Germans began to become concerned of the threat of invasion from the sea, they were compelled to deploy a total of 52 divisions (41 infantry, 11 panzer)," 7/ thereby weakening their forces fighting against the Soviets.

"The purpose of amphibious operations is to establish a landing force on a hostile shore in order to:

(1) Prosecute further combat operations.

(2) Obtain a site for an advanced Naval Base.

(3) Deny the use of an area or facilities to the enemy." 8/

Without going into a lot of specifics, I'd like to review, in the most simplistic terms, the sequence of an amphibious assault. Obviously, the first prerequisite is to have an enemy. It is vitally important that the planners for any amphibious assault acquire all the knowledge they can about the enemy's strengths and weaknesses. Further, they must study in detail the topography of the country and, particularly, its assaultable beaches and potential helicopter landing zones. Because the fact that opposing forces are not readily visible or in physical contact until the start of an amphibious assault, planners must build into their plans flexibility to cope with unforeseen contingencies. Planning must be detailed and all surface and air operations must support the assault. It is important that the landing force concept of operations ashore be completed in a timely fashion for all supporting plans to include fire support coordination, nuclear/chemical, preassault, advance force and subsidiary landings rely on a concept in order to begin planning.

The overall commander of the operation will issue an initiating directive to the task force commander. The directive may take the form of a campaign plan or operational plan and designate:

(1) The mission.

(2) The forces.

(3) The commander (task force and landing force).

(4) Special instructions on command relationships, if required.

(5) The amphibious objective areas.

(6) Areas to be secured.

(7) Special instructions.

The task force commander is normally Navy and the landing force commander, Marine Corps. The force to embark will be either a MAF, MAB, or MAU, as we discussed earlier in the study. Other forces could be evolved; i.e., U. S. Army and U. S. Air Force, in any event, their involvement and command relationships are spelled out in detail in The Doctrine for Amphibious Operations, a joint service publication.

Based upon the areas to be secured as set forth in the initiating directive, the task force and the landing force commanders together select a general course of action designed to accomplish the mission. On this decision, these commanders together determine a mission for the landing force, which is designed to attain the objectives of the amphibious task force. On the basis of this mission the landing force commander formulates his concept of operations ashore.

The landing force commander and the task force commander concurrently select landing sites and beachheads. A landing site is a continuous segment of coastline over which an assault force may land. These sites are designated by the amphibious task force commander within the objective area. A beachhead is a designated area of a hostile shore that when captured insures a continuous landing of troops and equipment and provides an area for further operations ashore. Naval considerations in the selection of landing areas include:

(1) The ability of the Naval Forces to support the landing and subsequent operations.

(2) Degree of shelter from unfavorable sea conditions.

(3) Hydrographic features of the beach approaches that would affect the draft of landing ship and craft.

(4) Hydrographic features of the offshore.

(5) Enemy mines.

(6) Conditions that might affect the enemy to defeat mine countermeasures.

(7) Conditions affecting the practicability of improving unloading facilities.

Landing force considerations in the selection of landing sites are related to the suitability of the landing area for attainment of the final ground objectives e. g., airfield, port; enemy concentrations. The configuration of the coastline plays an important part of landing area selections. An ideal coastline would tend to be straight or convex in shape. Less than desirable is a concave coastline which affords the enemy the opportunity to place flanking fire on the beach. Enemy capabilities that pertain to defensive obstacles, his reinforcing capability and armor threat all are to be considered.

The landing force commander selects specific landing beaches from available landing sites within the selected landing areas. These selections are reviewed and approved, based upon naval considerations. The principle factors in the selection of landing beaches concern the mission and concept of operations ashore. Various other considerations pertaining to beach gradient, obstacles, dunes, trafficability, exits and the suitability for beaching landing ships and craft play an important part in beach selection. At the same time, helicopter landing zones are selected. Their selection is based upon the concept of operations ashore, enemy capabilities, fire support (air, naval gunfire, artillery) and logistics support requirements. The stage is now set for the actual amphibious assault. There are numerous other considerations in planning for an amphibious operation and should be mentioned although space will not permit any detailed review of their functions. These planning considerations are: intelligence; supporting arms; nuclear and chemical warfare; communication; logistics; and ship to shore.

The execution of the amphibious assault begins with the embarkation of the assault forces, personnel, equipment and supplies. The landing requires detailed planning. This is critical to success of an amphibious operation for the force and its equipment must be loaded in the exact manner that will ensure expeditious off-loading at the landing area. Supplies to sustain the operation cannot be located in the bottom of the ship's hold and held inaccessible when their use is critically needed.

The rehearsal is the next step in an amphibious operation. Ideally, it is conducted on a beach similar to the one selected for the actual assault. A rehearsal gives the task force and landing force commanders the opportunity to test their plans, communications and timing. A rehearsal is not always conducted due to the contingency of the situation and training readiness of the troops involved.

The movement to the objective area naturally involves getting a variety of naval ships travelling at different speeds to some specific and designated area ready to commence an amphibious assault. The amphibious task group is divided into movement groups, depending on their arrival in the objective area. Some groups will arrive prior to D-Day to conduct advance force operations; i.e., mine clearing, beach reconnaissance, hydrographic survey, and underwater demolition. Others will be involved in deception operations so not to disclose the true landing force objective area. Advance force operations are decided upon after weighing the relative advantages of strategic and/or tactical surprise and requirements for preparation of the objective areas by air and naval gunfire.

The assault is the culmination of all of the above-discussed steps in amphibious operations. The assault phase begins when the assault elements of the main body of the amphibious task force arrive in assigned positions

in the objective area and terminates with the accomplishment of the amphibious task force mission. The ship-to-shore movement of the landing force by amphibious tractors, landing craft, helicopters and landing ships is the most critical part of the operation. This part of the assault is supported by air strikes and naval gunfire. Air superiority within the amphibious objective area is vital to the success of the assault. The water-borne landing teams are organized into waves containing personnel and equipment which are to be landed simultaneously. The first such waves are landed by amphibious tractors, which have the capability of moving across the beach and into the hinterland to act as an armored personnel carrier if needed. While the amphibious assault is taking place, and in accordance with the amphibious task force commander's plans for landing, the helicopter-borne assault begins. The ship-to-shore movement of the helicopter-borne assault is again the critical phase. Enemy antiaircraft guns must be silenced by air strikes or naval gunfire. Helicopter landing zones must be prepared by close-air support aircraft prior to the landing of the first helicopter wave. The key to the overall success of an amphibious operation is the necessity of building up combat power ashore from an initial zero capability to full coordinated striking power, as the attack drives toward the final objective. If the enemy is allowed to bring his forces to bear early in the operation, whereby he can disrupt or stop the buildup ashore, then, he has an excellent chance of pushing the force back into the sea.

Up to this point I've tried to give the reader an overview of amphibious operations as they are planned and executed by today's Navy and Marine Corps team. This review will become important when we look at what the period from 1985 to 1995 has in store for amphibious operations.

CHAPTER IV

AMPHIBIOUS OPERATIONS (1985-1995)

Presently, the Advanced Amphibious Study Group (AASG), located at the Marine Corps Development and Education Command, Quantico, Virginia is hard at work trying to define and evaluate alternative operational concepts for markedly improving the conduct of amphibious assault operations during the long-range period. In order to accomplish this task they have chosen to examine several operational concepts in order to define and evaluate the following:

(1) The relationship between the threat and launch distance of the landing craft from the shore.

(2) The relationship between the initial rate of force buildup ashore against several operational concepts.

(3) To identify any amphibious systems' deficiencies.

(4) To determine the effect of each operational concept on the composition of the assault element and advanced force element and on arrival times of each in the amphibious objective area.

The AASG will study and evaluate operational concepts against so-called independent variables characterized by differences in topography and hydrography within amphibious objective areas located in Denmark and the Sinai. The ship-to-shore (STS) phase of the study will incorporate new or proposed landing craft or landing conveyances that are currently or potentially available during the mid- and long-range period. The present organizational structure of the landing force will not be changed except as required to adhere to any new STS vehicles. The Marine Corps Operational Analysis Group (MCOAG) located in Washington, D. C. and the Marine Corps Development Center at Quantico, Virginia are conducting concurrent studies which will determine the practicability of utilizing air-cushioned-type vehicles or nonamphibious armored fighting vehicles. The first of these new air-cushioned vehicles we should see within the Navy inventory is the Landing Craft Air-Cushioned (LCAC). The second vehicle is named Landing Vehicle Assault (LVA) and is designed to replace the present Landing Vehicle Tracked Personnel (LVTP-7). I will discuss these vehicles in detail later in the study. MCOAG is specifically studying the cost and effectiveness of the LVA and other alternative vehicles. The Marine Corps amphibious assault capability will be addressed by both of these studies. Both AASG and MCOAG will use common scenarios, gaming techniques and common measures of cost and capability. The questions posed by the study directive, as mentioned earlier, will be analyzed by the use of amphibious warfare models as developed by AASG and MCOAG. These models will encompass a series of computer-based models to simulate amphibious assault operations. They will, no doubt, be of significant value to the Marine Corps in conducting amphibious studies in the future. The models used will help study a variety of problems and situations, some of which are:

(1) The effects of advanced force pre-H-Hour (H-Hour, the hour on D-Day when the assaults begin) air and naval gunfire operations to access the remaining threat to the landing force at H-Hour. Any

pre-H-Hour air and naval gunfire bombardment loses the element of surprise. The tradeoff here is whether or not a softening of enemy defenses is worth the loss of surprise. This could be a necessary tactic against a mobile enemy.

(2) The validation of concepts for operations ashore and the STS movement.

(3) Ammunition expenditure notes.

(4) The vulnerabilities of the various vehicles, landing craft, air-cushioned vehicles and helicopters to opposing weapons.

(5) The vulnerability of the Landing Ship Dock (LSD) to shore-based weaponry with the results to be extrapolated to other landing ships in the amphibious task force.

(6) Assessment of landing force aircraft vulnerabilities to ground-based weapons.

(7) The study of Navy/Marine Corps operations to include helicopter transport operations. Two other problem areas for the amphibious STS operations are the threat of coastal mines and the threat of enemy antiship Precision Guided Missiles (PGM). By the use of models and studies from various agencies, a set of tools will be assembled, which, for the first time, will allow a comprehensive study and gaming of the amphibious operation in its totality, in particular, the synergistic effect of air-ground operations.

As mentioned earlier, two mid-range scenarios will be studied: one depicting a MAF assault in Danish Jutland which provides a hydrography that makes amphibious operations extremely difficult, but at the same time, limiting the defender's use of armor due to poor geography; the other scenario contrives a MAF assault in the Sinai. Here the situation is reversed. The hydrography is nearly ideal for amphibious operations but the geography gently favors a mechanized force. One area of contention is the failure of the study to address the war at sea, problems of both the submarine, PGM and cruise missile threat. This problem will be solved by the assumption that the amphibious task force will have a safe transit to the amphibious objective area.

The AASG, in conducting research and analysis outside the models, has led to some interesting preliminary findings. These findings will be treated comprehensively in the analysis by the AASG once the models are operating. One such finding indicates that the helicopter STS movement of the stated force buildup requirements may be understated. Given a mobile enemy deployed at one half the Soviet doctrinal employment density, the introduction of two BLTs at L-Hour (landing hour) in regimental landing areas, located up to 25 miles inland, may not be a sound concept. The return trip 90 minutes later (if possible against the projected threat) may not provide adequate combat power for the helicopter-borne assault elements of two RLTs to defend against the anticipated response of a mechanized defender. It now appears that a capability of lifting one entire RLT in a single lift may be required. To achieve the added lift capability within foreseeable amphibious shipping constraints, the AASG must evaluate concepts which exceed the 24-man restriction on Marine Corps heavy helicopters or V/STOL assault vehicles.

The Soviet coastal mine capability outside of their air is seen as the most formidable threat opposing the amphibious operation with the exception of the missile by the AASG. The mine threat will be studied by an independent laboratory. The missile threat is a Navy responsibility.

AASG has worked on two nominal concepts for operations ashore for amphibious assault in a NATO scenario. They have made no study conclusions from these concepts. Both concepts are evaluated against an enemy who is given a capability to defend with two motorized rifle regiments reinforced with a representative share of division, Army and front support elements. Specifically, one motorized rifle regiment (reinforced) is deployed in a coastal defense posture, while the other is capable of reinforcing or counterattacking within the first twelve hours of the operation. These concepts also address the significant impact of antiaircraft weapons organic in Soviet ground forces and the threat they present to helicopters. Both concepts will weigh heavily on preponderant air superiority. They are also constructed to attack the enemy at a time and place where at least a 6:1 superiority of ground combat forces can be maintained by the attacker over the defending forces in contact through H+1 (the hour on D-Day when the assault begins, plus one). The effects of preponderant air superiority and naval gunfire support are complementary to but not included in the stated ground force superiority ratios. It is assumed that as the battle progresses, friendly ground force superiority ratios may decrease without a corresponding reduction in probabilities of successful mission accomplishment.

The first concept is characterized by the commitment of two RLTs at H-Hour in the surface and helicopter assault to simultaneously seize and defend a beach defense area and conduct a mechanized infantry assault to penetrate coastal defenses and seize and defend key terrain up to ten kilometers from the coastline. The second concept has shown two RLTs at H-Hour in the surface and helicopter-borne assault landing simultaneously. One RLT is configured as a mobile assault force and beach defense force. The other RLT is organized as a helicopter-borne force and must be capable of seizing and defending initial objectives with only that portion of the RLT which can be simultaneously lifted by transport helicopters. This requirement is related to the likelihood that antiaircraft defenses may restrain transport helicopters from returning to the same or adjacent helicopter landing zones used at L-Hour, thus temporarily isolating the initial assault elements from the remainder of the RLT.

These two concepts will set forth some finite requirements to accomplish tasks implying time-frame statements in quantitative terms. The AASG will have to analytically validate these requirements to see if they are valid. If not, they will be replaced by parameters which can be supported without any reorganization of the Marine Corps.

Future concepts to be studied will emphasize the following:

(1) Increased requirements to front-load heavy combat support units during initial unloading; for example, tanks and self-propelled artillery.

(2) The need to afford all units within a given maneuver element comparable mobility and armor protection when confronted by a mechanized defender.

(3) Greater utilization of transport helicopters to deploy and support combat support elements, more reserves and logistically sustain the landing force after initial landing of landing force assault elements at H-Hour.

(4) The use of assault amphibians to land combat support units; i.e., direct support artillery units with their initial combat supplies.

(5) The assignment of all personnel, equipment and supplies included in landing force assault elements to scheduled waves. The potential of certain new landing craft may also nullify the requirement to "pre-boat" all surface assault elements.

(6) The reduction of shore party support required to land the assault elements.

(7) The capability of all assault-landed maneuver elements to be mutually supporting shortly after H-Hour.

(8) Increased number of personnel carried per helicopter in assault landing beyond present limits.

(9) Concentration of landing force combat power to emphasize shock, surprise and maneuver in early seizure of limited landing force objectives.

I have talked about what the AASG is tasked to do by the way of studying and evaluating new concepts for the STS movement of the landing force. The new landing craft (LVA, LCAC) have also been mentioned. Just what is the trend or thinking on the part of the Marine Corps pertaining to the concept for employment of these new craft during the STS phase of amphibious operations.

First of all, the backbone of the assault landing is the amphibious assault tractor. It has been around in many sizes and shapes since World War II. It is carried by a Landing Ship Dock (LSD) and is relatively simple to launch and recover (it may be launched underway). It presents a low silhouette in the water and consequently is a hard target to hit. The present model LVTP-7 is powered by a diesel engine. It travels approximately eight knots in the water and 35 knots on land. The LVTP-7 can transport 25 combat-loaded Marines. Its main drawback is its slow speed in the water (8 knots). This slowness requires that it be discharged from the LSD within 4000 meters of the beach. This places those Navy ships that comprise the assault echelon of the amphibious task force at somewhat of a tactical disadvantage, for at 4000 meters they are within range of just about everything that a sophisticated enemy can throw at them, except most small arms. The LVTP-7 slow speed in the water, again, is a disadvantage for the most critical period, as I mentioned before, in an amphibious operation is the STS phase. It is of paramount importance that the landing force get ashore as quickly as possible so that the buildup within the beachhead area may begin.

Another landing craft that has been yeoman-like service is the Landing Craft Mechanized-8 (LCM-8). This craft is utilized during the assault phase of an amphibious operation to transport tanks, personnel and other pieces of heavy equipment. It, in turn, has a high silhouette and moves

through the water at approximately six knots. It also must, because of its slow speed in the water, begin its movement to shore from the line of departure (LOD) from less than a desirable distance from an enemy's long-range artillery, let alone their PGMs.

The present operational concept for the employment of a landing force with this particular mix of amphibious landing craft, i.e., LVTP-7 and LCM-8, is shown in Diagram 3. As seen in the diagram the LOD for the assault wave is two miles from the beach, making the assault transport ships comprising the attack groups extremely vulnerable to enemy direct and indirect fire weapons.

Future Marine Corps concepts call for the addition of a new Navy air-cushioned nonamphibious armor-protected landing craft. The first of these that are scheduled to appear within the Navy inventory is the Landing Craft Air-Cushioned (LCAC). It is advertised to have the capability of transporting tanks, troops and other heavy equipment over the water at speeds up to 60 knots. Because of the high speed of the LCAC the LOD can be moved to a safe distance from the beach. This will enable the Navy assault groups to lay off the shoreline in order to stay out of enemy artillery range. In addition, the LCAC has the inherent capability to transit on top of the water, move across the beach and into the hinterland, landing the troops and equipment high and dry. This opens up landing beaches for the landing force that were only accessible before by conventional amphibious assault tractors and landing craft. Not only will the number of usable beaches increase, but certain beach obstacles and mines will no longer be effective against this type of craft. Shown in Diagram 4 is the future concept for the employment of the LCAC. As pictured, not only is the current beach frontage expanded, but the LCAC gives the landing force the capability to skirt known enemy defenses. The route to the beach can also be altered to overcome obstacles and flank objectives. As seen in Diagram 5, a new concept for the landing of the LCAC, together with a flexible movement of the line of departure for the start of the assault wave to the beach is being studied. This will enable the amphibious task force commander to shift his task groups launch points, thereby making it difficult for enemy PGMs to find their mark.

Another new vehicle that, as of now, is still in the designer's drawing board is the Landing Vehicle Assault (LVA). If the old standby, the amphibious assault tractor, is going to be replaced, then this is most likely the candidate to do it. It will be capable of attaining speeds of up to 40 knots and carry approximately 25 combat-loaded Marines. It, too, has the capability to move onto the land area for dry off-loading. If this new assault vehicle is adopted, it would mean that the assault waves would be capable of executing the STS portion of an amphibious operation with both an increase in speed and added safety for the amphibious shipping. The assault waves' armor, antitank and personnel all could arrive quickly and within the first waves. This should add a new dimension to amphibious operations. In addition, it should increase the capability for ship dispersal in a nuclear war environment. With the anticipated speeds of this new generation of landing craft, any number of options should be available to the landing force commander.

Prior to the arrival of the LVA, perhaps after the 1985-1995 time frame, Marine Corps amphibious planners will have to develop concepts that call for the employment of both the amphibious tractor and the LCAC. One concept that is in the planning stage calls for the new version of the

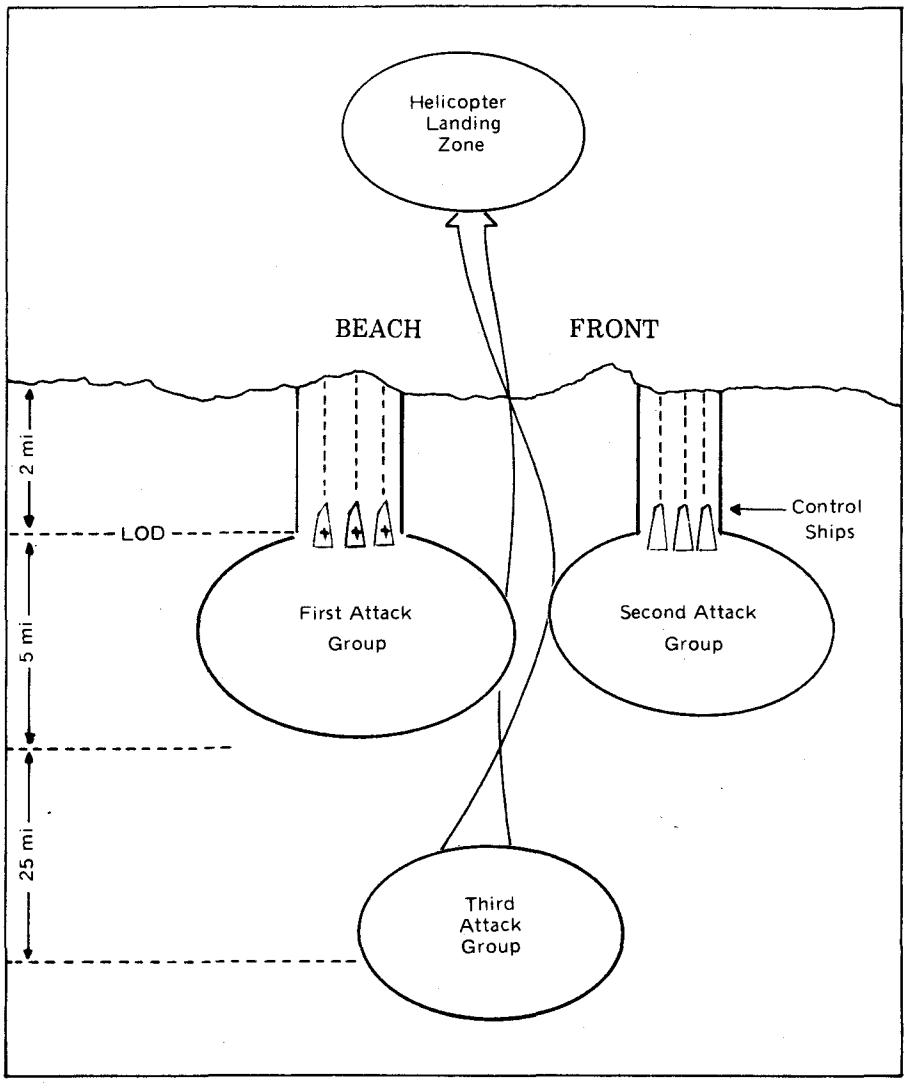

Diagram No. 3: Current Amphibious Assault

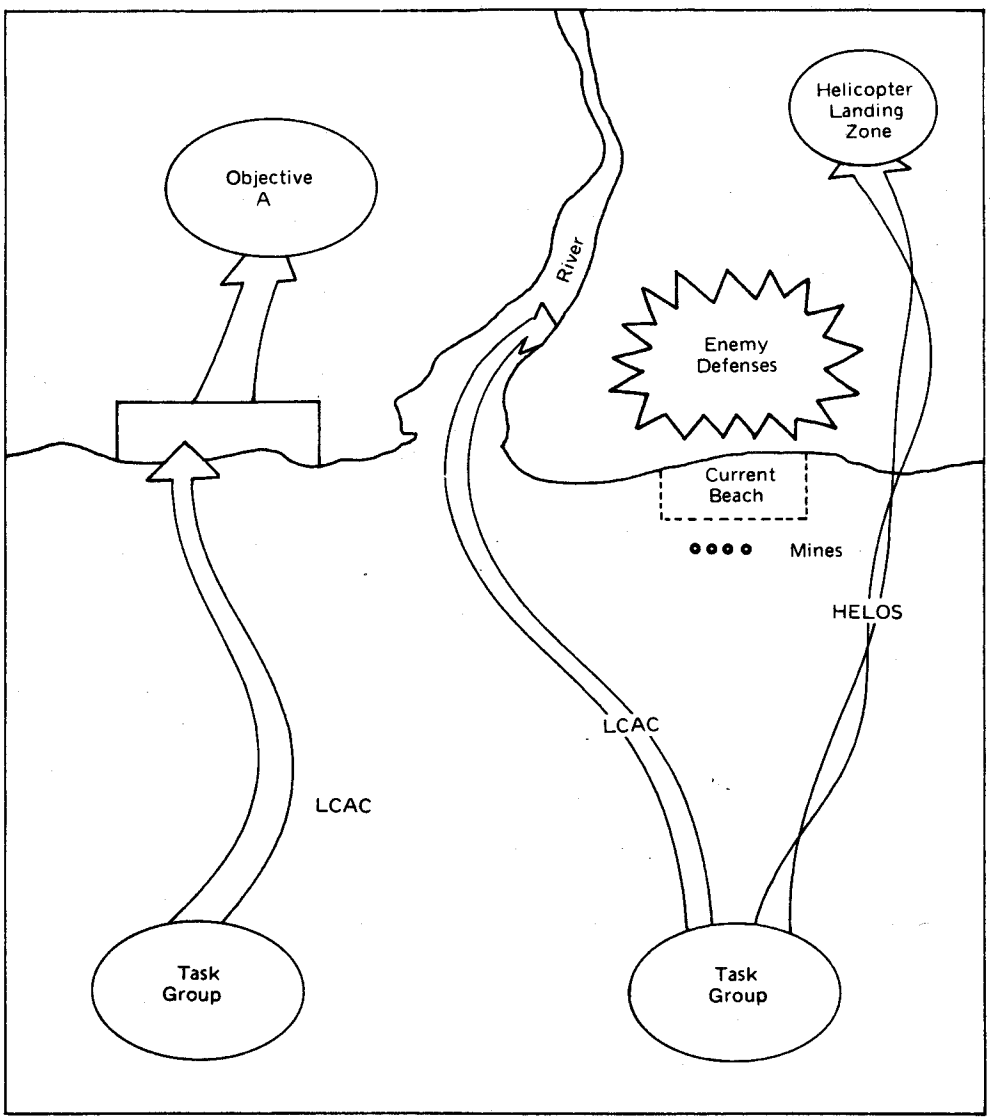

Diagram No. 4: Future Concept of Operations Over Natural Obstacles Utilizing LCAC

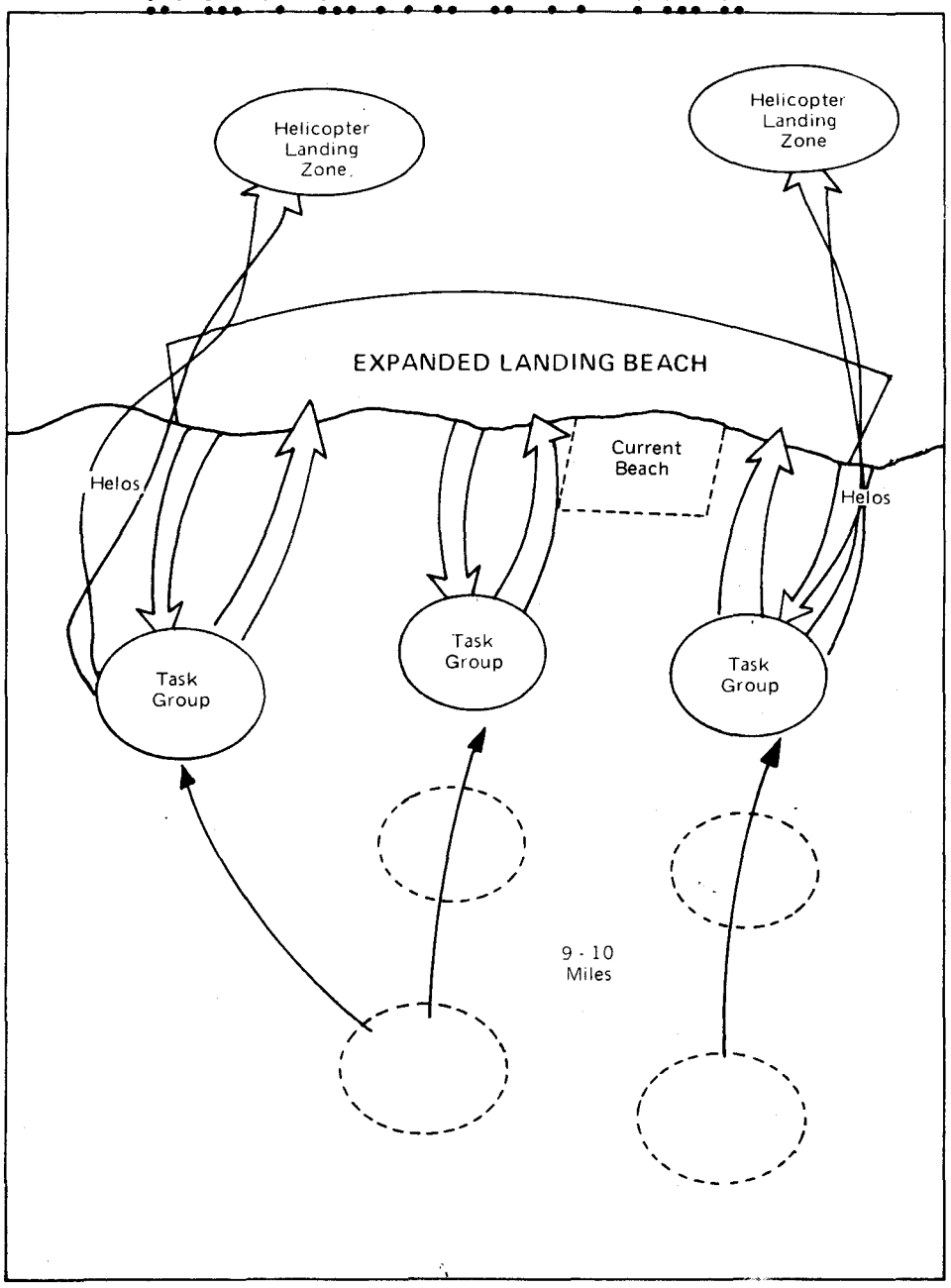

Diagram No. 5: Future Concept of Flexible Launch Points and Expanded Landing Front during Amphibious Assault

LCM-8, the LCM-9 (basically the same craft with an increase in speed reported from 6 to 14 knots) to transport the slower amphibious tractors from a position well outside enemy indirect fire weapons to a designated launch or drop point. From the drop point the tractors would begin their assault. Although this concept has merit it would appear that it would require a large number of LCM-9s to transport the numbers of amphibious tractors needed for the assault waves of a MAF-sized operation. It would also appear that if the LCM were to be used exclusively for the transport of amphibious tractors that this would restrict the number of tanks that are required to be landed by LCM/LCAC during the assault phase (50 tanks required for a MAF).

The Navy ships needed to transport the new air-cushioned vehicles are said to either be in the Navy's amphibious inventory (approximately 63 today) or a part of the Navy's new five-year ship-building plan. The present amphibious shipping requires very little modification in order to accommodate the new LCAC and LVA but additional amphibious shipping will be needed. The only unanswered question at this time is whether or not the Navy will be willing to spend the millions it will cost to supply the Marine Corps needs within the next ten to twenty years. The cost of a single LCAC is estimated to be close to $12.3 million and approximately 225 are needed. The LVA is a Marine Corps-funded and procured item costing around $800,000 per copy.

In order to see where amphibious ships fit into the Navy's five-year ship-building plan, I'd like to review for a moment the Navy's mission as it pertains to their future ship-building programs. The United States national military strategy is a forward defense strategy. This type of defense strategy is necessary because of the many varied U. S. world-wide interests that were initially discussed in Chapter I. The Navy mission, as set forth in U. S. Code, Title 10, is to be prepared to conduct prompt and sustained combat operations at sea and defeat any force that curtails the force use of the seas. From this mission the Navy must be ready to exercise its mission responsibility by performing three main roles: strategic deterence, overseas deployed forces, and sea lives of communication security (SLOC). The Navy's peacetime functions are: presence and crisis management. Presence, to include amphibious forces; e.g., Sixth Fleet supports U. S. foreign policy. Crisis management is the use of naval forces to include amphibious forces to stabilize critical situations before they escalate into war.

"The U. S. Navy has declined from 980 ships in 1968 to about 480 ships today." 9/ To a great extent, this decline was brought about by the Navy's decisions to retire many old ships in order to modernize the fleet. A National Security Council (NSC) study recommended a new five-year ship-building program which tends to reverse the decline and increase the fleet to approximately 600 ships by 1990. The study recommended the continuation of a carrier-centered Navy. And this is where the debate begins. The Navy recommends that the future carriers be the large-deck carriers. A carrier of the type as the Nimitz class, nuclear-powered and with its air-wings costs in the neighborhood of $7 billion. This excludes the cost of ships which must operate with the carrier to optimize its effectiveness. The Government Accounting Office (GAO) has reviewed the NSC study and has found that the study has left unresolved a number of issues which center around the high cost of aircraft carriers and their vulnerability to attack by cruise missiles. The point here is not to enter into the debate

going on between the Navy, NSC and GAO but to emphasize that the outcome of this debate bears watching. For the monies subsequently appropriated by the Congress for the Navy's five-year ship building program will have a lasting effect on future Marine Corps amphibious concepts and Navy amphibious ship and landing craft procurement.

Another fly in the ointment that surrounds any new concept for the employment of air-cushioned vehicles or, for that matter, amphibious tractors, is the enemy cruise missile and PGM threat. What can the Navy do to ensure the safe arrival of the amphibious task force in the amphibious objective area and sustain that safety, in light of a Soviet missile attack? Presently, there is no known defense against a series of missiles fired in succession at a ship. The Israelis in the 1973 Arab and Israeli war inadvertently attacked a U. S. ship with their land-based missile system. This unfortunate ship had to be sold for scrap iron. Even the lesser developed countries are capable of firing Soviet PGM missiles. The Soviet missile system has been in effect since the early 1960s. It is estimated that it has been greatly refined since its early development, making it even more lethal. The missile has no limitations on how far offshore the STS movement begins. It is capable of attacking amphibious shipping at any range.

Keeping in mind what was said concerning Navy money constraints, Marine Corps planners should not put all of their eggs in one basket when it comes to the LVA. The LVA, in the number required, becomes a very costly item. Granted, the concern for a reduced STS transit time and the safety of amphibious shipping Marine Corps planners should be looking very seriously at what tradeoffs are available in the event the Secretary of the Navy or Congress should cut desired procurement funds.

The first and foremost alternative is to convince the Navy that it must provide protection within the amphibious objective area for Naval shipping and Marine amphibious vehicle assault in defense against the Soviet system of cruise and and antiship PGMs. In order to do this the Navy must provide Naval gunfire, antimissile and air support in sufficient quantities to ensure that Marine assault forces have the opportunity to establish a beachhead and move ashore. Those items of armor, antitank, and other supplies and equipment needed to sustain the force in the accomplishment of its mission must be allowed access to the beach.

The second alternative is in the area of research and development. This is simply to equip certain numbers of the present family of amphibious assault tractors with an antitank gun. This should be a first-priority project (the Soviets have recently seen fit to do so). What is needed, initially, on shore to meet the threat of enemy armor, in addition to tanks, is an antitank gun mounted on a mobile platform, such as the present LVTP-7. The employment of mobile antitank weapons as the spearhead of any tank assault not only makes for more enemy tank kills but spares friendly tanks for the breakout or exploitation phase of the assault. For example, Field Marshall Rommel used this tactic to great advantage against the British in the desert fighting in North Africa during World War II. Rommel, operating with light infantry divisions and Panzer tank divisions in numbers of tanks inferior to the British, used his lethal 88s as antitank weapons in the assault up ahead of his tanks and did so with great success. 10/

Lastly, a mobile light tank and mobile antitank weapons system, capable of movement by helicopter during the assault phase is needed. A mobile tank/antitank weapons system that is helicopter transportable would provide the landing force with the fire power needed in the initial assault. In addition, it would provide the amphibious assault forces that are landing by helicopter with an antiarmor capability that is so vitally needed to insure the success of the operation. Helicopter transportable tanks and antitank vehicles would make it possible for the initial assault waves to be afforded a tank and antitank capability when needed and without the requirement of coming "through the surf" to join in the assault. There is a vehicle under study by the Army and Marine Corps called, Mobile Protected Weapons System, that may just be a substitute for the heavy nonairtransportable tank. "There are two versions under study: one weighing 15-20 tons; the other 25-40 tons, both highly mobile and possess 75mm medium caliber, antiarmor, automatic cannons." 11/

CHAPTER V

THE YEAR 2000

The anticipation over the arrival of the year 2000 has taken on a kind of mystical atmosphere. Everything that is written about the future, to include the signing of the Panama Canal treaties, uses the year 2000 as a benchmark. As an example, a recent Navy study titled, "SEAPLAN 2000" critically examines the ability of our naval forces to carry out their mission now and in the next 30 years. The movies "Star Wars" and "Close Encounters of the Third Kind" tend to whet our appetite for a glimpse of what life will be like in the future.

When taking a futuristic approach to writing about the year 2000, it is evident that it differs considerably from a planner's approach. The planner bases his determinations or forecasts on a steady linear progression of facts and carefully thoughtout quantifiable equations. On the other hand, the futurist, although not necessarily lacking the facts, nevertheless, may take a quantum jump into space, "letting the cards fall where they may." With my background, I find this latter method somewhat difficult to accomplish without the paste that binds the projection together, but in order to meet the challenge, I will dispense with the paste.

This is the chapter that gives me a license to steal. However, it presents me with a worrisome ordeal, for what I'm about to unfold in the next few pages may or may not come true. This is like courting a particular kind of disaster. Rather than lump my predictions into a neat scenario-type format, I will attempt to relate what has been written thus far into what is most likely to occur in the future. What will become obstacles to my predictions will be unexpected events. They are like wild cards in the pack. But, everpredictable events such as the invention of television that was going to reunite the family, destroy the printed word and the motion picture industry, and make classroom teaching obsolete has done none of these revolutionary things so far. What I am trying to say is that success, failure, and misinterpretation are all connected with any view of the future.

One facet of futures predicting that is somewhat consistent and must be taken into account, particularly at the global level, is economics, for economics determines the whole of mankind's impact on the earth. We shall look at economics from the standpoint of how world-wide economics will be affected by population, resource, food and energy.

The first of these factors, population, is perhaps the most serious of any of the problems that befall mankind. From a population of around five million in 8000 B. C., the number of human beings doubled and redoubled almost six times until it has reached 250 million by the beginning of the Christian era, which was brought about primarily by the invention of agriculture. Anytime you have a doubling of numbers in population, this is a very significant situation. For all of the commodities needed to sustain those new numbers of people, e.g., housing, food supplies, transportation and energy must double. The next doubling after Christ's time took a bit more than one and a half millennium. "By 1650 A. D., there were 500 million people. It took only 200 years to 1850 for the figure to reach 1000 million; and the number doubled to 2000 million in

1930, just 80 years later." 12/ Very few became concerned on this doubling of the population and some predicted even then that birth control would be the only answer to solving the problem. However, no one listened and the rate increased in 1960 to 6000 million. Now, United Nations' forecasters predict a world population of somewhere in the neighborhood of 7400 million in the year 2000. This, by the way, is probably a low figure, for underestimations have become the rule in population forecasting. This situation becomes particularly serious when taken into account that the highest population increases are among the lesser-developed countries. This will also have a serious effect on the North/South issue. As an example, and based upon the year 2000 figures, Central America has just 21 years in which to double its food supply, houses, schools, clinics, transportation capacity and gross national product. All this could even hope to do is maintain today's miserable standards in Central America. This all leads to the next question - will there be the resources necessary to sustain this large increase in population? At the rates we consume resources today and the rate we will have to consume these same dwindling resources to keep pace in the future, there will be critical shortages. Reserves of silver, copper, mercury, cobalt, uranium, zinc, lead, tin, and gold are all predicted to run out before the year 2000; some before 1990. This is only a small part of a very troubled equation. What about the world supply of food for this increased population? So far we have lost the battle to produce enough food to keep pace with an expanding world population. The future prospects for increased food production do not look any better.

Optimists will argue that the rich nations, and certainly the United States, will find ways to overcome these shortages. The recent North Sea oil finds are one of the examples they use, saying that with further exploration of the earth's land areas and oceans there will not only be abundant oil, but all resources will be found and mined. Whatever side you take, the problem of population, resources and food is a serious one and will affect all of us by the year 2000.

The energy question is another issue that must be dealt with now. Oil, in particular, is running out. It is predicted that even before the year 2000, demand will exceed production. Certainly, there are alternate sources, but these will primarily affect the generation of electric power. Will we be able to find an alternate energy source to power our vehicles, tanks, LVTs, airplanes, etc.? Sixty per cent of the oil that we consume is used for mobility purposes. It is mobile energy that will be the problem and there is no solution in sight. There may be some substitution by the use of electric cars, but has anyone designed an electric motor to power a 60-ton tank? Energy or the lack of it affects the economy of nations which, in turn, slows growth, causes inflation and leads to recession. So, not only will the world be faced with population, resources, and food problems that in themselves all affect the economics of the society we live in, but the lack of oil-producing energy to move that society will be affected. Cannot it be said, without even the slightest chance of failure, that the Middle East, with its vast oil reserves, will become the pot of gold at the end of the energy rainbow? It would not be surprising if even certain Western nations, heavily dependent on oil to fire their economies, will start to look with a greedy eye upon the possibility of grabbing an oil field for their very own. I think that Soviet intentions are already clear. The Soviets also need oil; their supplies cannot last out the 20th century. By inching

into the Middle East through the horn of Africa, they have started a slow creeping towards the pot of gold.

The year 2000, because of the problems described above, will be unstable and prone at any minute to erupt into armed confrontation. The biggest threat will be wars over oil and the control of oil fields. War between the lesser developed countries will be common, as will the danger of bringing the super powers into the conflict, depending whether or not national interests are at stake.

Nuclear war, although not considered possible, due to kill ratios (at least 50% by today's standards), will be a constant threat to mankind. "Arsenals of the future will contain nuclear weapons, not much different from those we know today, except in being more compact, efficient, and cheaper. Missiles will be much, much more accurate." 13/ We will see the laser direction finder and ray come into its own with a capability of destroying satellites with MIRV-configured warheads.

There will be space stations and command and control stations located on the moon. The space shuttle scheduled to begin its regular flight to space and back in 1979 will provide the vehicle to transport the men and equipment needed to man the moon station and space laboratories of the future.

Robots will also play a part in the future society. They will be used for time savings and to perform the menial, boring tasks associated with production assembly lines. I can see robots playing a part in the military. Not only could the robot be of great value in a garrison environment, but in combat to breach mine fields, monitor enemy activity by the use of radio-controlled reconnaissance vehicles, or detect chemical, biological and nuclear warfare agents. The use of military robots is only limited by the imagination.

Undersea exploration will become important in the next decade, not only for the search of oil, minerals, and natural gas, but for farming purposes. One way of increasing the world food supplies will be by the use of underwater farms monitored by underwater laboratories and policed by submarine-type vehicles. Vast underwater mining and farming complexes will extend from this nation's shores as will other such complexes from competing nations. Raids upon underwater farms and mining settlements will be common and cause great concern among nations. The lesser developed nations will be the most seriously affected by the raiding of underseas laboratories and farms, for they will need the products these underwater farms will produce to feed their growing and hungry populations.

As I have predicted, the world in the year 2000 promises to be one full of turmoil and great expectations. The need for a strong defense and the ability to project power by the employment of naval forces with a forceable entry capability will become even more important.

What problems does this pose for the future conduct of amphibious operations? First of all, none of the planning up to this point really addresses the survivability of the surface fleet in the event of a nuclear war. Most planners would rather not discuss this delicate subject. When one talks about the survivability of an amphibious task force lying off a hostile shore and under nuclear attack, the discussion becomes even more

muted. If the question of whether or not the Navy possesses the capability to defend its ships against the cruise missile or PGM attacks is posed, again there is the lack of definite affirmative response. All this leads me to believe is that the underlying problem connected with the defense of amphibious shipping against an enemy with sophisticated weaponry or having a nuclear capability (more and more nations will possess nuclear munitions by the year 2000) is that there is none.

The solution to the problem is to start planning now to have the assault echelon of the amphibious force deployed by submarine. Nuclear-powered submarines are the only weapons system that will be available in the 21st century that can be counted on to provide the landing force with security from both nuclear attack, cruise missiles and PGMs. Submarines have the great advantage of mobility over vast areas of the ocean. They also have the advantage of maintaining a high level of secrecy in their movement. Radar is not effective underwater and the only method of detection under present technology is by sonar. Submarines, however, can operate at great depths and this permits them to hide under temperature inversion layers that reflect sonar waves or under schools of fish. "U. S. nuclear submarines have the ability to transit the waters at the top of the world with the added advantage of being able to move between the Atlantic and Pacific oceans secretely and quietely." 14/ This ability to move between oceans means any closing of the Panama Canal does not affect the transit of the submarine.

I envision submarine patrols with embarked Marines aboard, capable of landing from surface craft or by VSTOL aircraft, all launched from a submarine.

Embarked Marines, probably now called "Sub-Marines" could give this country a survivable landing force in the event of nuclear war (there has been no mention of what percentage of this country's armed forces could survive a surprise Soviet nuclear attack). In addition, amphibious operations would take on a new dimension. With the capability of the assault echelon moving in relative secrecy to the amphibious objective area, the force could maintain the elements of mobility and surprise. Support for the assault phase could come from missile/rocket firing submarines or Navy and Marine air stationed well offshore. Submarine aircraft carriers could also be designed; in fact, there are ships now, i.e., "the 355-foot Floating Instrument Platform, or FLIP, designed to provide the most stable platform ever put to sea. While underway, FLIP looks not unlike other ships, but once on station it floods its after tanks and drives itself like a fence post below the surface turbulence. When FLIP is in the vertical position its stern, containing four stories of laboratories and living quarters, rears only fifty feet above the water." 15/

This is a ship in being that with further study could be designed to be completely submergeable and only surface when required to launch its aircraft.

Do the ideas of Sub-Marines and submarine aircraft carriers seem preposterous? Perhaps they are, but one thing is certain: such a force so designed will be the only one capable of surviving in the 21st century.

This brings to mind Admiral William Leahy's remarks to President Harry S. Truman concerning the A-Bomb. "That is the biggest fool thing we

have ever done . . . the bomb will never go off, and I speak as an expert in explosives."

The concept of having embarked Marines aboard submarines is not new for this is done all the time by reconnaissance Marines whose mission it is to covertly land on an enemy shore, gathering information prior to and during an amphibious operation. I feel the time is upon us to expand this capability by using the technology we have to build submarines that are capable of accommodating the assault echelons of Marine air-ground task forces. The purpose of this study does not allow me to go into the specific details of what a submarine of this type will look like, let alone how it will launch its assault landing craft. This, I will leave up to the imagination of the reader. But, is it feasible? Yes, it is as feasible as the design of the space shuttle or the computer. Is it practical? It is practical if this nation desires to have a military force capable of surviving a nuclear exchange with the resources that could take the fight to the enemy's shores, undetected, and immune from attack from cruise missiles or PGMs. Only time will tell, but let us not continue to hold on to concepts that will become outdated and overtaken by events. A case in point was the Navy's refusal to part with the battleship. Now the same appears to be true with the large-deck aircraft carrier. The tools of warfare are not only changing but have reached the hands of those who, in the past, could do no more than fire rifles at opposing amphibious task forces. Now they have the capability, either with their new-found technology or by alliances with other nations, to fire missiles with nuclear warheads.

FOOTNOTES

1/ Dickson, Paul, The Future File, Rawson Associates, New York, 1977.

2/ Luttwak, Edward N., The Grand Strategy of the Roman Empire, The Johns Hopkins University Press, 1976.

3/ Marine Corps Order 3120.3_, The Organization of Marine Air-Ground Task Forces.

4/ FMFM6-1, Marine Division.

5/ FMFM 5-1, Marine Aviation.

6/ FMFM 4-1, Logistics and Personnel Support.

7/ Hart, Liddell, The Rommel Papers, Harcourt, Brace, 1953.

8/ Doctrine for Amphibious Operations w/change 1, 1962.

9/ Comptroller General's Report to Congress, Implications of the National Security Council Study, "U. S. Maritime Strategy and Naval Force Requirements" on the Future Naval Ship Force, 1978.

10/ Hart, Liddell, Op. Cit., P-240.

11/ Marine Corps Gazette, March, 1978.

12/ The Living Earth Series, Life in the Future, The doubleday Press, 1976.

13/ Hilsman, Roger, The Crouching Future, Doubleday, 1975.

14/ Stafford, Edward, The Far and the Deep, Putnam's Sons, 1967.

15/ Warshofsky, Fred, The 21st Century, Viking Press, 1969.

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