# TECHNOLOGY AND CHANGE IN NATIONAL DEFENSE PLANNING IN THE TWENTIETH CENTURY

by

TIM CARTER

B.A., The University of British Columbia

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTERS OF ARTS

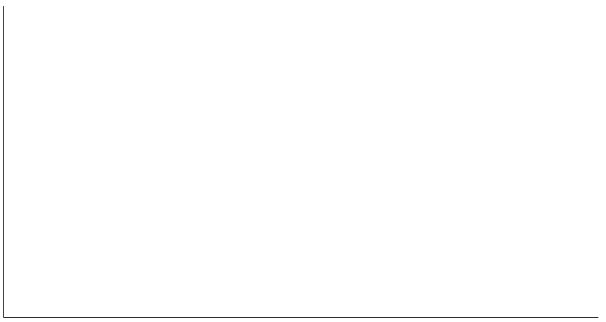
in

THE FACULTY OF GRADUATE STUDIES

(Department of Political Science)

We accept this thesis as conforming

to the required standards

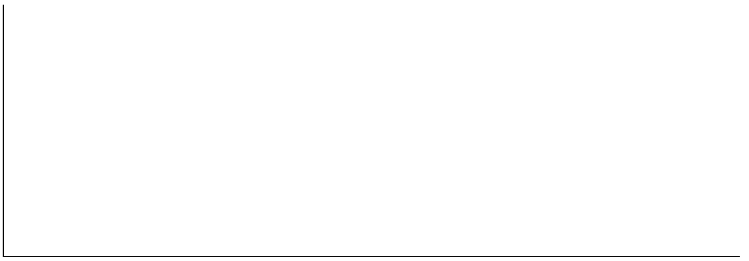


THE UNIVERSITY OF BRITISH COLUMBIA

December 1991

© Tim Carter

In presenting this thesis in partial fulfilment of the requirements for an advanced degree at the University of British Columbia, I agree that the Library shall make it freely available for reference and study. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by the head of my department or by his or her representatives. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.



Department of Political Science

The University of British Columbia
Vancouver, Canada

Date December 30, 1991

**ABSTRACT**

The national security policies of the great powers have changed dramatically since the turn of the century. These changes have had vast implications for the study of international relations. This thesis examines the role of technology in changing national security policies during the twentieth century. In order to do so, two issues are addressed. First, how is national security policy formed, and how does it change. Second, what role has technology played in this process, and how has this role changed over time.

Three historical cases are developed to address these questions. Each case highlights a different period in time and in technological development. Together, the three cases incorporate most of the major technological changes of the twentieth century, as well as the main streams of thought regarding the importance of these changes to security planning. Three possible models for explaining the development of national security policy, and technology's role in it, are developed and applied across the appropriate cases. Each model provides insight into the nature of the national security policy at one particular point in time.

Since the turn of the century, national security policy has been radically revised at every level of planning. The conceptual foundation upon which security policy was constructed has been fundamentally altered. Threats to the state have changed, as have responses to those threats. Traditional notions, such as the defense of the state, have been discarded in favor of security through deterrence. The concept of deterrence

itself has changed, as traditional methods of deterring attacks no longer apply.

In each case the extent of these changes is more apparent. Similarly, in each case the role of technology in creating these changes is more dominant. By 1960, the role of technology is the single most important factor in understanding national security policy. Technology shapes not only the methods by which a state may be secured, but also the conditions of its security problem. The penultimate technological development, nuclear weapons, has truly revolutionized national security and, therefore, national security policy.

## TABLE OF CONTENTS

## LIST OF FIGURES

## I/ INTRODUCTION

Technology has progressed in the twentieth century from a factor which was largely used to solve the national security problems of the state, to one which actually creates and conditions these problems. Certain threats to the modern great powers are unique to the late twentieth century. They have arisen due to technological innovation and technology's interaction with military planning. This thesis investigates the role of technology in national defense policy during the twentieth century. It examines three different cases in an attempt to explain the extent to which technology has altered the threats to the state, and the way in which states have sought to address such threats.

In an international system governed by the principle of anarchy, all states must have some policies that ensure their security. Many states do not have autonomous security policies. For instance, Iceland is completely dependent on the United States for military protection. Great powers, by definition, cannot rely on others for their national security. While they may enter into alliances in order to maximize their strength, they cannot rely on others for their protection. To do so would be to forfeit their position as great powers.

National security policy is usually a collection of political and military activities and plans designed to protect the territory, independence and wealth of the state from hostile outside influence, usually in the form of threats of military attack. A secondary, but related, issue for this thesis is how

does national security policy operate, and how has it changed during the twentieth century? Change can be divided into two categories: first, how has the defense of the state in the abstract changed over time, and second, how have substantive strategies changed to conform (or not) with abstract principles. This study will further examine the role of technology in change, both in abstract notions and in actual strategy, and will suggest that the role of technology in changing strategy has been immense.

In order to examine change in national security policy, three cases will be presented. They are: Germany in the period 1897-1914, France from 1930-1940, and the United States from 1960 to 1969. Each case study will discuss the national defense policy of the state in question. Each state was undisputedly a great power during the time under consideration. Furthermore, each had a clear and well thought-out national defense policy. The time periods were chosen to match different eras of technological innovation, and to match key actors with some of the catalytic events of the twentieth century. The specific states themselves were chosen not only because each was a great power, but also because each represents a different attitude about technology and change in defense planning.

These cases involve neither the same state, nor even similar strategic situations. Change across the cases will therefore not consist of differences in specific plans, as these are bound to be different anyway. Rather, this thesis will examine significant change in the general manner in which states seek to secure themselves. While details will be necessary to give

substance to the cases, the subject of analysis will be the more general principles which underlie the specific actions and plans put forward by the state. The common denominator in each case will be the role of technology. Analysis in each chapter will revolve around technological change and its role in national security policy.

## II/ METHODS OF ANALYSIS

### 1.0 Introduction

Modern technology has been a dominant factor in national security policy in the twentieth century. As Martin Van Creveld has noted:

> war is permeated by technology to the point that every single element is either governed by or at least linked to it. The causes that lead to wars and the goals for which they are fought; the blows with which campaigns open and the victories with which they (sometimes) end; the relationship between the armed forces and the societies that they serve; planning and preparation and execution and evaluation; operations and intelligence and organization and supply; objectives and methods and capabilities and missions; command and leadership and strategy and tactics; and even the very conceptual framework adopted by our brains in order to think about war and its conduct-all are and will be affected by technology. (Van Creveld 1989, 311)

The terminology surrounding the security planning of the state is less than precise. It will be useful at this point to define the terms to be used throughout this thesis. National security policy is held to mean the overall plan, or group of plans, as well as the actions which arise from these plans, designed to secure the state from external enemies.[1] As such, it is a general umbrella term for all activities concerning the state and its security; for analytical purposes more specific terms are required. Grand strategy is a specific set of beliefs and plans for the security of the state at the level of inter-state relations (Craig 1986, 481; Luttwak 1987, 240). This is

---

1 National security policy is also sometimes referred to as national security strategy.

the highest functional level of security planning. Military doctrine is the operationalization of certain elements of grand strategy at the level of military confrontation and conflict.[2] It is important to note that grand strategy is operationalized in ways other than military doctrine. For instance, there is a diplomatic component to grand strategy, as well as an economic one. Both of these will be operationalized in doctrines as well, although they do not fall within the scope of this study.

Within the general rubric of grand strategy there are five issues that are important to this study: first, the nature and importance of alliances to the security of the state; second, the nature of deterrence and its importance to the security of the state; third, the nature of strategies for the protection of the state in the event that deterrence should fail, and perceptions as to their relative importance and effectiveness; fourth, the general predilection of grand strategy as a whole to favour either offensive or defensive options in the pursuit of state security; and finally, perceptions about the usefulness and importance of the use of force in the defense of the state. These five issues form the national security agenda of the state. Change in the nature of grand strategy is expected to manifest itself through these five issues.

As the operationalization of grand strategy, military doctrine deals with military issues and planning for the implementation of the military aspects of grand strategy as a

---

2 Luttwak considers both military doctrine and grand strategy to fall under the single term strategy. However, for the purposes of this thesis it is important to distinguish between the two (Luttwak 1987, 70).

whole. The impact of military technology on military planning will be manifested in military doctrine. The only thing that technology actually changes is military capabilities; therefore, the influence of technology must be understood in the context of military doctrine. Therefore the interaction between military doctrine and grand strategy can be used to help explain exactly how technology influences grand strategy. At the same time, technological change gives military doctrine an independent role in the national security making process. The affects of technology on military doctrine are uncontrollable, and, therefore, may change military doctrine in ways which force unintended changes at the level of grand strategy.

All of the technological changes to be examined are related more or less directly to military capabilities. In many cases changes have taken place in the nature of military equipment itself. In other cases technology has affected areas which, while not originally military, have had great military significance (Buzan 1987, 26-27). A good example of this is the case of rail transportation during the late 19th century. Here, while the technology originated in a civilian element of society, its importance for military planning was quickly realized (Van Creveld 1977, 89-92; Brodie and Brodie 1973, 148-151).

The source of technology is secondary in importance to the impact that it has had on the military capabilities among the great powers. In particular, how has technology altered thinking about military issues within the particular state in question?[3]

---

3 When the cases are examined in depth, specific states will be considered. However, for this chapter the theory and models will be developed with reference to a prototypical great power. This abstraction is necessary to clarify the nature of the

Clearly there have been important changes at the level of military capability as a result of technological developments in the twentieth century. The next issue then becomes how changes in military capabilities lead to changes at the level of grand strategy.

## 2.0 Grand Strategy: Threats and Responses

The formulation of grand strategy involves a three part, interactive process. First, grand strategy requires the development of, at least, a semi-coherent world view by the decision-makers of the state. Some general notion of the strategic environment and of potential friends and enemies is necessary for a more specific evaluation of threats to the state. The determination of a package of threats should lead to a subsequent determination of a package of goals and objectives of the grand strategy.[4]

> [t]he art of strategy is to determine the aim [of the strategy], which is or should be political: to derive from that aim a series of military objectives to be achieved: to assess these objectives as to the military requirements they create, and the preconditions which the achievement of each is likely to necessitate: to measure available and potential resources against the requirements and to chart from this process a coherent pattern of priorities and a rational course of action. (Fraser, quoted in Craig 1986, 481)

In seeking to achieve the goals of grand strategy, decision makers must, therefore, assess the assets available to the state

---

relationship between doctrine, strategy and technology without complications, such as bureacratic politics, that inevitably arise when real cases are considered.

4 The first of which will be the survival of the state (Waltz 1979, 91-92).

and formulate plans for maximizing resources. One common method for increasing resources is the formation of alliances. Alliances, particularly if they are directed against a specific opponent, provide the state with potentially many more resources than would otherwise be available. As well, the general economic foundations of national security must be considered as resource management. For instance, access to crucial mineral resources or the focus of the national economy on militarily significant industry might be concerns here.[5] The key issue is the management of resources in order to maximize capabilities, military or otherwise, for the defense of the state.

Grand strategy is concerned with the creation and composition of military forces. Since the threats under consideration here are primarily military in nature, the responses to them will inevitably be dependent on military action. There are two issues for military planning. At the most general level, questions such as the need for particular forces are inseparable from grand strategy as a whole and, possibly, are better considered a part of resource management than military planning. Operational military planning, the military doctrine of the state, can be separated from grand strategy. Given that the impact of technology will always manifest itself initially at this level, there is considerable merit in separating doctrine and strategy.[6]

---

5 See the example of the Soviet Union under Stalin in the 1930s (Kennedy 1987, 322-325).

6 Inevitably the the border between these two concepts will be somewhat hazy. The procurement of weapons systems, for instance, would seem to fall within both categories, depending on the level at which it is viewed. A good example of how doctrine and strategy are divided is the question of whether the state should

At the most basic level, all grand strategies will consider two methods for securing the state. These are deterrence and physical protection (Snyder 1961, 3-5). Deterrence involves the pursuit of the interests of the state through the use of threats (Morgan 1977, 9). Physical protection involves the securing of the state and its interests through the actual use of force.[7]

There are two types of deterrence situations. Direct deterrence involves the use of threats to address hostile activities aimed at the defending state itself. For instance, the use of threats by a state to prevent an attack on its own territory is considered an example of direct deterrence. A state may also use threats to protect allies or other assets outside of its borders, which it feels are important to its security. This is referred to as extended deterrence, as the state extends deterrent threats to cover areas or issues that are not contained within its borders (Buzan 1987, 151-153).

Deterrence can be achieved in two ways, depending on the nature of the threats used. Threats can be manifested either in terms of retaliation or denial. Retaliation implies that in the

---

maintain a navy, as the Germans asked themselves in the late 19th century. In this case the decision to create a navy was one of grand strategy as it addressed strategic questions such as the nature of threats and goals and the nature of strategic interactions such as alliances. Once this decision was made, however, considerations about the structure of the navy, its intended missions and plans for the fufilment of these missions were all issues of military doctrine.

7 Obviously the dividing line between these two components of grand strategy is somewhat murky. In many instances the preparation for deterrence entails physical protection and vice versa. On the other hand, as many authors have noted, under certain circumstances decision makers may have to choose between plans which emphasize one component at the expense of the other. See Glen Snyder 1961.

event of non-compliance, the state will retaliate with military force against the transgressor.[8] Deterrence through denial is the threat to deny an opponent his goals by increasing the direct costs to him of pursuing those goals (Snyder 1961, 15). Each type of deterrence threat requires a different military posture, as well as different capabilities. It is quite possible, however, for a state to possess both denial and retaliation capabilities.

The physical protection of the state can be accomplished in two ways: defensively or offensively.[9] Defensive measures revolve around the fortification of the state. This incorporates actions such as the construction of fortresses, the development of military forces capable of repelling invaders, and the structuring of the state so as to make it as invulnerable as possible.[10] Offensive measures, on the other hand, generally involve activities to protect the state by removing external threats before they can actually damage the state. Notions such as preventative or preemptive war are closely associated with such a strategic posture. An offensive strategy may be based on the hypothesis that the state will not be secure as long as strong potential rivals exist in positions where they can harm the state.

---

8 For this thesis the definition will be limited to military deterrence. In general, retaliation need not be limited to military means. (Buzan 1987, 135; Snyder 1961, 14-15)

9 The use of terms such as defensive and offensive refer to general orientations rather than precise military plans, which are properly considered under military doctrine. (see below)

10 This may include self sufficiency strategies with respect to vital resources and alliances designed to divert possible attacks away from the state itself.

In order for a grand strategy to be successful, it must have the military means at its disposal to accomplish whatever goals it has set. In a certain sense, then, the success of grand strategy depends on the viability of the military doctrine (Posen 1984, 16). In the case of protective strategies, the problem is clear: the military forces of the state must have the ability to either defend the state or to remove the threats to the state through force. In the case of deterrence, the issue is somewhat more complicated. In order for threats to be effective, they must be perceived as credible by the states against which they are targeted (George and Smoke 1974, 551).

Deterrence credibility rests on two factors. First, the state must have the ability to carry out its deterrent threats (George and Smoke 1974, 48-49; Snyder 1961, 13, 16). This is part of military doctrine, and is subject to the same considerations as planning for physical protection (Snyder 1961, 4). Another factor involved in credibility is the perception on the part of the target that the state will, in fact, carry out its threats. While this also is connected with military capability, other factors are equally important here.

Intentions are a crucial element of deterrence credibility, particularly in the case of extended deterrence. When an asset or issue is only indirectly related to the security of the state, there may be some doubt as to the willingness of the state to carry out deterrent threats in order to protect it (George and Smoke 1974, 551-565). Credibility can be enhanced through the development of strong political and economic ties between the deterring state and its ally (Buzan 1987, 184). Credibility also

becomes an issue when weapons of mass destruction are involved. The immense consequences of a nuclear war have fostered considerable debate as to whether the superpowers, in particular the United States, would actually carry out its stated deterrence threats in the event of a war (Buzan 1987, 169-170).

## 3.0 Military Doctrine

Military doctrine represents the manifestation of grand strategic principles at the level of military planning and operations. Both successful deterrence and the successful protection of the state from attacks depends on an effective military doctrine. Military doctrine can be divided into three related components. First, doctrine is concerned with the composition of military forces, the types of weapons they are equipped with, and the coordination of expected roles with force structure. Second, doctrine involves planning for the posture of forces during peacetime. This relates to what these forces are prepared to do and how they are arrayed under normal conditions. Finally, military doctrine involves planning for the conduct of military operations in the event of hostilities, such as war, limited war, or a serious crisis. Military doctrine is directed against particular threats as identified by grand strategy; therefore, the capabilities of opponents must be considered as well as the capabilities of the state itself.

Military doctrine can have either an offensive or a defensive orientation. This orientation may be determined by technological factors, geographic factors, or planning

preferences. The orientation of military doctrine can affect the nature of deterrent and protection strategies. If the military doctrine of the state is offensive, then deterrent threats will likely be based on retaliation. The opposite will be true if the doctrine is defensive. Similarly, the nature of the protective strategy will depend on orientation of the military doctrine. An offensive military doctrine will necessitate an offensive protection strategy, while a defensive orientation will lead to a defensive protection strategy.

A direct connection exists, therefore, between the orientation of doctrine and the types of deterrence and protection options at the level of grand strategy. This should not be confused with the relationship between the overall orientation of grand strategy and that of military doctrine. While an offensive doctrine indicates a particular type of deterrent strategy, it does not necessarily mean that grand strategy will be symmetrical. In fact, it is quite possible for a state to have a defensively oriented grand strategy and an offensive military doctrine.

## 4.0 Technology and Change: Three Models of Interaction.

In seeking to explain technology and change, an important issue is the nature of the interaction between military doctrine and grand strategy. The following section will present three different models for explaining this interaction. Each model will correspond to one of the cases presented in the following chapters, and will be used there to further explain change at

that time. Two connections between doctrine and strategy have already been discussed. The first had to do with the overall effectiveness of grand strategy. Without a congruent military doctrine, a successful grand strategy will be unlikely (Snyder 1961, 84; Holley 1986, 13). A second connection was the relationship between the orientation of doctrine and the type of deterrent and protection strategies chosen.

In both cases, the relationship has both a normative and an objective element. In normative terms, it is important to have the correct doctrine-to-strategy connection in order to maximize the chances of success. Overall effectiveness will also be increased if the general orientation of grand strategy corresponds with that of military doctrine. Objectively, the connection between strategy and doctrine is important because it provides a mechanism through which technology and change can be better understood. For analytical purposes, the connections are important because they can illuminate the flow of influence within the grand strategy formulation process as a whole.

The first model will be derived from some traditional perceptions about the interaction between strategy and doctrine, based on the writings of Clausewitz (Clausewitz 1976). Clausewitz envisioned a system of grand strategy formulation whereby the state's political leaders constructed grand strategy based on their perceptions of the security requirements of the state. These considerations then affected the nature of military doctrine.

> If war is part of policy, policy will determine its character. As policy becomes more ambitious and vigorous, so will war, and this may reach the point where war attains its absolute form. (Clausewitz 1976,

606)

The demarcation between the political interests, referred to here as grand strategy, and military doctrine, is not absolutely clear. In some instances grand strategy may well influence the conduct of military operations; in others it may not. What Clausewitz makes explicitly clear, however, is that issues of grand strategy are never fully absent from the process of military planning.

> That the political view should wholly cease to count on the outbreak of war is hardly conceivable unless pure hatred made all wars a struggle for life and death. In fact, as we have said, they are nothing but expressions of policy itself. Subordinating the political point of view to the military would be absurd, for it is policy that creates war. Policy is the guiding intelligence and war only the instrument, not vice versa. No other possibility exists, then, than to subordinate the military point of view to the political. (Clausewitz 1976, 607)

What was so striking about this theory, when it was first written, was Clausewitz's insight into the truly political nature of warfare. There was no logic to warfare unless military issues were subordinated to policy. Hypothetically it is possible, and has occurred in some cases, that grand strategy exerts a dominating influence on military doctrine. The first model, therefore, suggests that while technology and grand strategy affect military doctrine, military doctrine does not act as an independent variable. Case number one will suggest that the Schlieffen Plan was a good example of such a process. Technology has an impact on doctrine in operational terms, but the implications of technology for military operations were not a dominant factor for grand strategy.

Fig II.1: The First Model of Interaction

| Technology ----> Military Doctrine <---- Grand Strategy |
|---|

The second model, in contrast to the first, suggests a situation in which military doctrine, and therefore technology, can have a direct influence on grand strategy. The second model is based upon the modifications to Clausewitzian thinking made by a number of writers, in particular Edward Luttwak (Luttwak 1987). Luttwak divides strategy as a whole into five different levels. The four lower levels incorporate most of what is here termed military doctrine. The fifth level for Luttwak is that of grand strategy, which roughly corresponds to grand strategy as it is outlined above.[11] All five levels interact in a hierarchical sense, while internal logical processes interact within each level individually. (Luttwak 1989, 69-71, 179-180)

> The five levels form a definite hierarchy, but outcomes are not simply imposed in a one-way transmission from top to bottom because the levels interact with one another in a two-way process. Technical effects only matter insofar as they have tactical consequences, but tactical-level action depends in turn upon technical performance to some extent, thus as many tactical events make up the operational level even as the latter determines their significance. Similarly, unfolding operations have their effect at the level of theater strategy, which defines their purpose, while military activity as a whole affects what happens at the level

11 Luttwak's levels of strategy, from lowest to highest, are: 1) the technical level, involving equipment and military technologies; 2) the tactical level, involving small unit tactics and the use of weapons; 3) the operational level, involving the operation of military units in an interactive situation; 4) the theater level, concerning the conduct of a campaign within a geographically define theatre; and 5) the grand strategy level, involving the broader political context in which military strategy operates. (Luttwak 1989, 70)

> of grand strategy even as the scope of such activity is determined at the highest level. (Luttwak 1989, 70)

Translated, this means that each level of strategy has the ability to affect the others, depending on the circumstances. Furthermore, influence in the structure need not necessarily move directly through the hierarchy of levels. Radar technology and its effect on theater level strategy is used to demonstrate how influence can jump several levels (Luttwak 1989, 209).

Luttwak shows convincingly that technology can, though military doctrine, have a definite impact on grand strategy. However, this is a limited explanation of the ways in which technology can change grand strategy. Luttwak fails to explain the autonomous nature of modern destructive technology. In part this criticism may be unfair, as the influence of technology is not the focal point of his work. Nevertheless, without a full understanding of how technology affects the strategy making process, his model remains incomplete.[12]

The second model of interaction is similar in nature to the model suggested by Luttwak, although couched in different language. The primary assumption of this process is that technology influences both grand strategy and military doctrine.[13] Technology can create operational military conditions which lead to changes in grand strategy. Since all of

---

12 What Luttwak wants to explain through this model is the paradoxical nature of logic in strategy. For him, therefore, connections between the different levels is not as important as logic processes within each level.

13 Virtually all writers in strategic studies agree that technology can and does have a great impact on military doctrine. The issue of contention is usually how, and to what degree, this impacts on grand strategy.

the technological changes under consideration are of direct military significance, change as a whole is manifested through military doctrine.[14] The role of military doctrine as an independent variable is somewhat misleading. In fact, military doctrine acts as a device through which the independent role of technology affects grand strategy.

Fig II. 2: The Second Model of Interaction

| Technology ----> Military Doctrine <----> Grand Strategy |
|---|

For example, as noted above, the orientation of a military doctrine can and does have a great influence on the type of deterrence strategies selected. As well, a preference for a particular emphasis in grand strategy, say for deterrence over protection, may also result from doctrinal influences. Doctrine may simply rule out certain strategic options either as physically impossible or prohibitively risky. So long as the makers of grand strategy consider issues of military feasibility and planning, military doctrine will have some measure of influence over grand strategy. This is neither profound nor original; in fact, the second model encapsulated the contemporary conventional wisdom regarding the influence of technology on strategy (Quester 1977; Posen 1984; Holley 1986). The weakness

14 A military doctrine is by definition a subjective entity, representing the opinions of particular planners and institutions, rather than some objective reality about the nature of technology and its importance. Therefore, it is not analytically correct to argue that technology changes grand strategy through doctrine but rather that perceptions about technology at the level of military doctrine change grand strategy. Throughout this thesis it is important to keep in mind that planning at every level is subject to perceptions, and that, therefore, one can rarely talk about an objective reality.

of the model is not in its structure but in its scope: an important aspect of technologically driven change is left out.

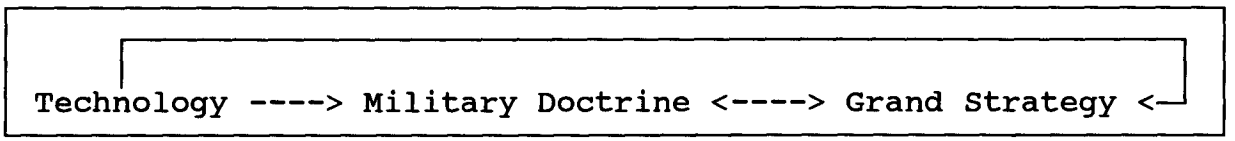
I therefore put forward the third model, on that suggests that technology influences not merely the military capabilities of the state, but also the threats to the state as they are perceived at the level of grand strategy. This is the result of innovation within military doctrine. The third model identifies changes which take place through the processes described by the first two models, but which remain unrecognized by them. The goal of this model is to describe how technology changes the strategic environment through unintended consequences of innovation at the level of military doctrine.

Innovation at the level of military doctrine leads not only to new military planning, but also to new strategic threats to the state. According to the first two models, threats are perceived at the level of grand strategy. These threats are then addressed through the development of grand strategy and military doctrine. At the level of military doctrine, new technology is incorporated into military planning based on how this technology has altered the military capabilities of the state. Over time, new technology will lead to innovation of some kind in the military doctrine of the state. This innovation will, in turn, create new threats to the state at the level of grand strategy.

The development of military aircraft serves as a useful example here. Aircraft were first deployed for military purposes shortly before the First World War (Brodie and Brodie 1973, 117). While their initial role was reconnaissance, other missions such as troop support, strategic bombing and interception all soon

became important (Brodie and Brodie 1973, 177-180). In terms of doctrine, the use of aircraft was part of a general incorporation of new technology into military planning in an effort to win the First World War by breaking the deadlock associated with trench warfare. However, the introduction of the aircraft in an attempt to solve one security problem soon led to completely new threats. In particular, the threat of mass strategic bombing raids on the civilian population of the state became a dominant factor in defense planning prior to the Second World War.

Fig II. 3: The Third Model of Interaction




The rise of new threats due to technology is clearly unintentional and, once the technology is deployed, uncontrollable. Technology can, therefore, have a direct impact on grand strategy without moving upwards through military doctrine. This is not to say that the first two models are wrong; rather they are incomplete. Unless the ability of technology to create new threats is understood, it will not be possible to explain the total impact of technological change on grand strategy.

In effect, the third model argues that technology has the ability profoundly to affect the strategic environment within which states must develop their national defense policies. Technology does this by altering the nature of threats to the state. The process as a whole can be envisioned as a loop.

Innovation at the level of military doctrine creates new threats to the state. These threats force changes in grand strategy, leading to new strategic objectives and goals. These new goals present military doctrine with a new set of problems; the doctrine then seeks to address these problems through innovation, and so the process repeats itself.

In summary, then, there are three possible processes through which technology can influence grand strategy. The first model, based on the precepts of Clausewitz, had little room for technological influence, outside of operational military planning. Since military doctrine was clearly subordinate to grand strategy, there was little or no opportunity for operational military factors to translate technological change into change at the level of grand strategy. The second model, based on a revision of Clausewitz, suggests that operational military factors can influence grand strategy. Luttwak has suggested that in some instances, operational factors are so important that they shape policy at the level of grand strategy (Luttwak 1989, 70). Therefore, technology alters operational factors, and these factors, in turn, lead to changes in the grand strategy. The third model suggests an entirely different process of influence. It suggests that when technology alters operational military capabilities, it can, inadvertently, create new threats to the state. New military technology is capable of fundamentally altering the security problems of the state. This change reaches to the heart of the national security policy of the state, by redefining its starting point as well as its principle logic.

As noted above, each of the cases to be considered below was selected to fit one of these models. The cases are taken from points in the twentieth century when military technology was providing decision makers with new options, possibilities and problems. Therefore, they will not only elaborate on the theoretical structures put forward by the models, but will also illuminate certain trends in the development of technology and its impact on national security policy over the course of the twentieth century.

## III/ GERMANY 1897-1914: THE DOMINANCE OF GRAND STRATEGY

> *It is clear, consequently, that war is not a mere act of policy but a true political instrument, a continuation of political activity by other means. What remains peculiar to war is simply the peculiar nature of its means.*
> *The political object is the goal, war is the means of reaching it, and means can never be considered in isolation from their purpose.* (Clausewitz 1976, 87)

### 1.0 Introduction

The legacy of Clausewitz played a crucial role in the way that German strategists viewed warfare prior to World War One.[15] Military thinkers were conditioned in their understanding of warfare by the notion of "war as a continuation of policy by other means" (Clausewitz 1976, 87). The swift and productive victories over Austria in 1866 and France in 1870-1871 reinforced the concept of war a positive exercise. It might be bloody, but war could be beneficial to the state as well. The "other means" available through war could fulfil policy objectives that might be difficult, if not impossible, to attain in peacetime. Analysis in this chapter will be aided by the first model presented in chapter one. This model reflects the analytical framework within which the Germans constructed their grand strategy. The model suggests that, regardless of the objective importance of technological change, it will be difficult for this change to influence grand strategy.

---

15 A particular interpretation of Clausewitz was popular in Germany prior to 1914 which did not represent the full extent of Clausewitz's writing. In particular, strategists tended to focus on the notion of war as a continuation of policy and the recognition of total war and battles of annihilation, while ignoring Clausewitz's arguments about the strength of the defensive and the importance of political and military relations (Brodie 1973, 10-11; Howard).

The first case is Germany prior to World War One because it is an example of the traditional methods of strategic thinking. It provides insights into how national security planners viewed warfare and its implications for the security of the state. Finally, it provides the thesis with a historical starting point from which to begin arguments about change. In order to conclude that substantial change has in fact taken place, it is necessary to have a clear conception of how security issues stood at the beginning of the process.

The chapter will begin with an examination of the relevant technological changes prior to 1914. The grand strategy and military doctrine of Germany will then be described. Finally, the interaction between strategy and doctrine will be investigated. This process will illustrate both how the Germans constructed their national security policy and how technology affected this policy.

## 2.0 Technological Changes: Railroads and Rapid Fire

Prior to the mid-nineteenth century, technology had not played a significant role in determining victory in the contest between the great powers for over 300 years (Dupuy 1980, 169). Wars simply were not won or lost based on superior or inferior technology.[16] All of the major European powers had the same basic weapons, communications and transportation capabilities.

---

16 This applies only to inter-European warfare, where all sides had roughly the same equipment. Clearly technological superiority was a crucial factor in the colonial expansion of the European powers.

In some cases, such as Marlbourough's march to Blenheim, existing technologies were exploited more effectively by one side than the other; however, innovations were few, and the time needed to reequip an entire army allowed potential opponents ample time to copy innovations (Van Creveld 1989, 167). The combination of the industrial revolution with the social revolutions of the nineteenth century greatly altered the relationship between technology and warfare. The ability to raise mass armies and to equip them with mass-produced weaponry allowed states to rapidly increase their military strength relative to their neighbors.[17] By the end of the nineteenth century, technology had become an important factor in military strategy. It was thus widely perceived that a decisive advantage could be gained on the battlefield through technological innovation (McNeill 1982, 223; Dupuy 1980, 175-176).

**2.1 The Weapons Package: Some General Observations**

Changes in military technology from 1850 to 1914 revolved around two key issues: mobility and firepower.[18] The technological package at the turn of the century held out to strategic planners the possibility of immense strategic mobility while concurrently threatening them with an operational

---

17 It took Prussia 26 years to reequip its forces with breech loading rifles (1840-66). However, when the French saw the result of Prussian firepower during the war between Prussia and Austria in 1866, it took only four years to completely refit the French army. See McNeill 1982, 236.

18 The one technological development which does fit into these categories is the airplane. However, prior to the First World War aircraft had been used only for reconnaissance purposes, and consequently their impact on planning was slight (Brodie and Brodie 1972, 177).

quagmire.[19] The construction of large and efficient railway networks vastly improved the strategic mobility of armed forces in Europe. Large bodies of troops and supplies could now be rapidly concentrated, deployed and supported in the field for an extended period of time (Brodie and Brodie 1973, 148-151). Railroads were first used in this role in 1859, but their real importance did not become evident until the Prussians used rail to facilitate their victories in 1866 and 1870 (Brodie and Brodie 1973, 148-151; Ropp 1959, 161-162).

If railroads created vastly greater strategic mobility, the increase in firepower had the precisely opposite effect at the tactical and operational level. The development of infantry weapons and artillery capable of accurate and rapid fire over long ranges made the movement of troops anywhere near enemy forces both difficult and costly. In order to avoid the effects of massive firepower, armies were forced to rely on fortifications and dispersion (Dupuy 1990, 28). The end result was that, on land at least, forces could be rapidly moved from one battlefield to the next; however, once on the battlefield their ability to move declined to almost nothing.

At sea, technology again had two effects which were in many ways as contradictory as the effects of technology on land. Advances in steam engines corresponded with new developments in steel armor and rifled, long range naval guns. The result was a

---

19 The term "technological package" refers to the combination of all of the relevant technological changes of the period. This package is more important, in many ways, than individual changes, because it represents the complete picture of technological change as it was available to planners at the time.

capital ship capable of rapid speeds and great firepower.[20] However, these changes did not significantly alter the nature of naval warfare. Capital ships still contested with each other for dominance of the sea in large naval battles. At the same time, the perfection of the submarine and independently propelled torpedoes was to have a major influence on the nature of sea warfare. Submarines combined stealth with killing power, allowing states like Germany to wage strategic warfare along the English supply lines without ever contesting England's control of the sea in a conventional sense.[21] At sea, technology led to the refinement of traditional notions of warfare while simultaneously providing the means by which such notions might be rendered obsolete. On land, railroads meant that the ability of the great powers to mobilize their military resources (manpower) had reached unprecedented levels; however, the rise in firepower meant that the ability of states to use these resources was likely to be low.

**2.2 Weapons Technology: Some Selected Examples:**

The single greatest technological change between 1850 and 1914 was the incredible increase in the amount of firepower available to land armies. Basic infantry weapons were now

---

20 The HMS Queen Elizabeth, the most modern battleship launched prior to WW I, had a top speed of 24 knots, mounted 8 15" guns and had 13" thick armor. A full broadside from all eight guns weighed some 15,600 pounds (Hough 1979, 143).

21 German submarines at the outset of World War One had an operational range of 5000 miles. However, prior to the actual use of unrestricted submarine warfare during World War One thinking about the role of the submarine as a strategic weapon was largely undeveloped. Instead the submarine was seen as one more weapon with which control of the sea might be contested (Brodie and Brodie 1973, 181).

accurate up to 2000 yards, while artillery was accurate beyond 6000 yards.[22] Both types of weapons had greatly increased rates of fire (Howard 1984, 44). Well trained infantry could fire 30 rounds or more a minute, while machine guns were capable of putting out in excess of 400 rounds a minute (Brodie and Brodie 1973, 147). Combined with the fact that there were now far more infantry and artillery than had ever been the case in the past, the amount of deadly firepower on the battlefield was greatly increased.

The French 75mm artillery piece, which became a standard design in most armies before the outbreak of war in 1914, is a good example of how technology increased firepower. Three different innovations contributed to the greatly increased lethality of this weapon.[23] First, the development of explosive shells in 1886 increased the number of fragments thrown out by a shell from 2-5 in 1860 to over 1000 by 1900 (Dupuy 1980, 213). Second, the new recoil mechanism on the French gun brought the weapon back to the same place it had been before it was fired. This allowed gunners to lay down an accurate barrage on the same target without having to reset the gun after every shot. As a result, guns could fire ten or even twenty rounds a minute, as opposed to one or two before this invention (Brodie and Brodie 1973, 143). Finally, the invention of the telegraph and field telephone allowed forward observers to direct the fire of

---

22 This compares to about 200 yards 100 years before.

23 Breechloading and a rifled barrel greatly increased the range and rate of fire of the Seventy Five over weapons fifty years earlier; however, these innovations were not new by the time the French developed their cannon.

artillery onto targets that the gunners themselves could not see (Dupuy 1987, 204). The field telephone allowed armies to make the most of the new range of field artillery, vastly expanding the geographic reach of the new firepower.[24]

The vast increase in firepower created an obvious problem for military planners: how to protect troops and how to move men across contested areas without sustaining prohibitive casualties. In part, this problem could be addressed through the use of fortifications and camouflage (Van Creveld 1989, 172). However, in order to advance an army would have to leave its defensive positions and expose itself to enemy fire.

**2.3 The Effects of Technology on Planning: A First Cut**

One observer, at least, felt that new technology would have a profound impact on the nature of land warfare. Jean de Bloch had seen the impact of technology on several wars between the Russians and Ottoman Turks in the nineteenth century. He argued that by the turn of the century war between the great powers would be a long and drawn out, bloody affair dominated by defensive fortifications.

> The immense extent of the theater of war; the vastness of the field of battle; the difficulties presented by attack on entrenched positions and fortifications, and those natural defenses on the battlefield which soldiers are now taught to utilize, and which inevitably will be utilized in view of the deadliness of modern fire; the impossibility of massed attacks; finally, the duration of battles, which may be prolonged for several days, and which may yield no decisive results - all these are new circumstances. (Bloch 1899, 41)

---

24 Trevor Dupuy has attempted to give an empirical indication of the lethality of different weapons over different times. According to his index, a pre 19th century cannon had a lethality of 940, as compared to 386,530 for the French Seventy Five (Dupuy 1989, 313).

After the experiences of the Boer War (1899-1902) and the Russo-Japanese War (1905-06), there was general agreement within the military institutions themselves that infantry attacks would be more costly than in the past (Sheffield 1988, 52; Strachan 1983, 114-117; Bond 1983, 84-85). Military planners did not draw from this the conclusion that offensives were no longer possible. In fact, offensive action was still thought to be the only way of winning a war (Snyder 1984, 79-80; Van Evera 1984, 58-63). Instead, various tactical proposals were suggested which would overcome the problem of defensive firepower (Van Evera 1984, 61). These ranged from greater artillery support to flanking attacks which avoided fortified positions (Snyder 1984, 21; Bloch 1899, 31). In short, problems and potential solutions were contained at the level of military doctrine.

Many military planners actually felt that increased firepower would help offensive operations more than defensive ones. Because offensive forces held the initiative in any encounter they could concentrate overwhelming firepower against a smaller defensive force (Van Evera 1984, 61). These planners overlooked the fact that defensive forces could avoid the terrible effects of firepower through fortifications, while attackers could not protect themselves. As well, the increased range of weapons meant that dispersed defenders could concentrate their fire on the point of attack without having to mass their forces.

## 3.0 German Grand Strategy: Dealing with a Two Front War

> The politician should fall silent the moment that mobilization begins (Von Moltke the elder, quoted in Brodie 1973, 11).

The strategic environment that the Germans found themselves in at the turn of the century was both rigid and menacing.[25] By 1900 Germany was already the strongest single state in Europe (Kennedy 1987, 199-201,209-214). Yet, due to a combination of geography and political factors, it was faced with the probability of having to confront both France and Russia at the same time in the event of a war (Holsti 1991, 171). In the past, one of the cornerstones of German strategy had been the avoidance of just such a situation. Through diplomacy, Bismark and other statesmen had sought to prevent two other major land powers from allying with each other against Germany (Taylor 1954, 255-280). The flexibility of the balance of power during Bismark's tenure made this goal easier to achieve.

By 1894 the balance of power in Europe had been largely set, with the central powers of Italy, Austria-Hungary and Germany opposing the Franco-Russian Entente. Only England remained uncommitted to a continental alliance. As a part of its new-found status as a great power, Germany followed a policy of colonial expansion abroad (Fischer 1972, 136-38). However, unlike England, this policy could never make a significant contribution to Germany's national security. Although German

---

25 The term "strategic environment" refers to the combination of political, social, military and economic conditions in the international system that are relevant to national security. It means the outside world in so far as it is important to the security of the state.

statesmen and the German public desired a world policy, it was generally recognized that in order for Germany to have a free hand in colonial development it must first have a dominant position in continental Europe (Fischer 1975, 118-119).

**3.1 The Formulation of Grand Strategy**

In abstract terms, the greatest threat to Germany during this period was that of physical invasion. Other threats included a loss of prestige or the diplomatic isolation of Germany through the disintegration of her alliances. However, the purpose of Germany's alliances was primarily to protect against a physical invasion. Furthermore, a dramatic loss of prestige was most likely to come as the result of Germany having to withdraw in an international crisis. Germany was only likely to yield due to fear of an invasion.

In more specific terms, German strategists identified the primary threat to the security of their state as the military alliance between France and Russia.[26] It was from these two states than an invasion was likely to originate. So long as these states presented a military threat to Germany, the size and status of colonial possessions was of secondary importance to the security of the state.[27] Furthermore, expansion into Africa and

26 The threat from England was less of a factor for the Germans. In part, this was due to the fact that German political and military leaders did not consider the English army to be much of a threat to German security. When asked in 1870 what he would do if England landed an army in Germany in support of France, Bismark is reputed to have replied that he would "call out the local constabulary and have it arrested." (Taylor 1954, 340-341; Rothenberg 1986, 312).

27 While colonial possessions did hold some potential for increased wealth and, therefore, power, the fact that the status quo colonial powers opposed German expansion meant that seeking security through colonies was like putting the cart before the horse.

Asia could only lead to conflict in Europe, as a war with one of the colonial powers was unlikely to be contained within colonial areas.[28]

France, politically hostile due to the German possession of Alsace and Lorraine and militarily threatening due to a military doctrine based solely on a massive and headlong offensive into Germany, presented a clear threat for German strategists (Holsti 1991, 171; Snyder 1984, ch.2, 41-56). While the French threat was based solely on the possibility of an invasion, Russia presented the Germans with a variety of problems. On the one hand, the vast reserves of manpower available to the Russians represented the greatest potential threat to the Germans in the event of a prolonged war. On the other, the ideological threat that the Russians presented towards the Austro-Hungarians in the Balkans jeopardized Germany's most important ally and, therefore, the overall balance of power in Europe.[29]

The objectives of German grand strategy were derived from these threats. Chief among these objectives was the ability to neutralize or defeat the military forces of France and Russia in the event of a war. Subsidiary objectives included a strong set of alliances, the neutrality of England, the security of Austria-Hungary's Balkan interests and the expansion of German influence in Europe and abroad. In the case of alliances and English

---

28 See, for instance, the threat of war with respect to the Moroccan crisis of 1911. War over Morocco would never have been limited to Africa, partly because the Germans did not have the resources to fight a major war outside of Europe.

29 This can be seen by the German actions taken in July 1914 in support of Austria-Hungary that precipitated the war.

neutrality, these objectives were merely part and parcel of an overall strategy to win a war in Europe.[30]

**3.2 The German Strategic Agenda**

The composition of German grand strategy is best considered in the context of these overall objectives. Alliances were a key element of German security. For over twenty years, German diplomats tried to involve England in the Central Alliance (Taylor 1956, 365, 373; McDermott 1979, 107-108). More successful efforts secured Germany the support of Austria-Hungary, Bulgaria and Turkey (the Ottoman Empire) before the outbreak of war. Italy was a military ally of Germany as well, although when war actually broke out the Italians failed to live up to their pre-crisis commitments (Fischer 1975, 392-396).

The main purpose of alliances in this period was the strengthening of the military power of the state. Allies provided troops and drew off the military power of potential enemies. This is particularly clear with respect to the German alliance with Austria-Hungary. In political terms, the German alliance with Austria-Hungary was more troublesome than it was

---

30 An interesting question here is the development of the German navy during this period, as it does not appear to have any function relative to these goals and, in fact, would seem counter-productive, as it virtually guaranteed the hostility of England. The construction of a blue water navy is best explained by bureacratic politics; Tirpitz and the other supporters of the Navy redefined German security to include the expansion of Germany into colonial Africa and Asia, a move which both required a navy and put Germany into conflict with England anyway. Throughout the period in question Tirpitz competed with the Germany army not just for funding but also for the right to determine the nature of German security interests. First in terms of funding and later when war actually broke out, the Army won due to the fact that the threat from the French and Russian Armies was more obvious and more noticeable than abstract concepts about German rights overseas.

beneficial. It confused the rhetorical position of "Teuton versus Slav" that was being developed to justify a war with Russia (Fischer 1975, Ch 17. esp 386). It also made German policy in the Balkans increasingly inflexible, particularly with respect to other allies in the region.[31] Despite political differences, allies were sought and cultivated for military reasons. Germany desperately needed Austrian and Turkish manpower to counterbalance Russia's tremendous advantage in military potential, particularly in the early stages of a war when the focus of German attention would be in the West (Kennedy 1987, 203).

German alliance building was based on the notion that sooner or later Germany would have to fight a war with France and Russia. The Germans believed that their security could be best attained through the neutralization of these enemies. As a result, both the grand strategy and the military doctrine of the time were aggressive in nature. The alliance between France and Russia was itself perceived by the Germans to be an aggressive act. Alliances based on offensive action seemed to be the only viable response. There was, therefore, a general predilection at both the level of military doctrine and grand strategy for offensively oriented policies.

The use of force was considered to be an inevitable element of security policy.[32] War was unavoidable; the principle issue

31 Rumania had been the source of considerable German diplomatic efforts from the turn of the century onwards. However, territorial disputes between Austria-Hungary and Rumania prevented any real agreement with Germany so long as Austria-Hungary remained a key German ally (Taylor 1956, 515).

32 In fact, as Luard has noted, there was a general willingness among European leaders to go to war in order to secure foreign

for security planning were the terms on which a war was fought and the chances that Germany would have for attaining a military victory. Furthermore, based on past experiences in 1866 and 1870, German strategists believed that the state could benefit from the use of force (Luard 1986, 259). If the principal threats to German security could be eliminated through warfare, this would provide Germany with a stable international environment in which to expand its power.

Given these beliefs about the utility of warfare, deterrence was not highly valued by decision makers. This was partially due to the perception among some German strategists that a preventative war held the key to German security. Even if deterrence were to be successful in the short run, conflict was inevitable in the future. Therefore, there was a strong incentive to fight when Germany was perceived to have a strategic advantage (Van Evera 1984, 71-78). Decision makers simply did not perceive deterrence as providing long terms solutions to the problem of national security.[33]

If deterrence was not highly valued, the opposite was the case for protection. Given the weakness of deterrence and the preference of German strategists for military action, the security of the state rested almost entirely with physical

---

policy or security goals (Luard 1986, 357).

33 As a revisionist power, it would have been difficult for Germany to fufill its foreign policy aims exclusively through a policy of deterrence. At the least, a strategy of compellance would have been necessary. Furthermore, given the strength of the Entente, it is unlikely that either France or Russia would have been susceptible to threats over a long period of time. The political fallout of the 1911 crisis in Morocco in both France and Germany was such that public opinion was unlikely to support a policy of compromise (Taylor 1954, 472-473).

protection. The exact nature of the protection element of grand strategy was dictated by the military doctrine of the state, known as the Schlieffen Plan.[34] Given the military nature of the threats to the state, protection had to be the central element of grand strategy. This preference for protective strategies was reflected in the composition of military doctrine.

### 4.0 Fighting a Two Front War: German Military Doctrine and the Schlieffen Plan

The military doctrine of Germany was shaped by two factors: the need to fight a two front war against France and Russia, and the belief by military planners that such a war must be short and decisive (Rothenberg 1986, 312; Ritter 1958; Geyer 1986, 530). Faced with having to fight a two front war, Schlieffen concluded that he must neutralize one of Germany's opponents early in any conflict before the full weight of the Franco-Russian alliance could be brought to bear.[35] As the Russians were known to have a huge reserve of manpower but a slow mobilization schedule, Schlieffen decided to attack France first. France would be a threat earlier and would also be easier to defeat in a single large battle (Ropp 1959, 223; Ritter 1958, 24-27; Rothenberg 1986, 316-317).

Schlieffen concluded that Germany had to have an offensive doctrine in order to have any chance of winning a war. This had not always been the case with German planning. Von Moltke the

---

34 See the discussion of military doctrine below.

35 Alfred Von Schlieffen was the Chief of Staff of the German Army from 1891 to 1906. Von Moltke (the younger) succeeded him a few years later and was the German commander when war broke out in 1914.

elder, Chief of Staff under Bismark and the architect of the stunning Prussian victories over Austria and France (1866 and 1870), firmly believed in the power of the defensive.

> Germany cannot hope to rid itself of one enemy by a quick victory in the west in order to turn against the other. We have just seen how difficult it is to bring even the victorious war against France to an end. (Moltke quoted in Rothenberg 1986, 306)

Rather than attempt to defeat one power and then the other, Von Moltke hoped to use the power of the defensive to fight both to a standstill and then await a diplomatic solution (Rothenberg 1986, 306). Furthermore, Von Moltke feared the implications of an offensive doctrine. His experience in France in 1870-1871, where a popular movement kept France in the war long after her regular armies had been defeated, led him to conclude that war was no longer likely to be either swift or profitable:

> Gentlemen, it may turn into a seven, even a thirty years' war! Woe betide him who sets Europe ablaze. (Moltke quoted in Geyer 1986, 531)

Von Schlieffen, however, felt that a prolonged conflict would be a disaster both for German interests and for German society (Geyer 1986, 530). He fully expected a war fought along Von Moltke the elder's plans to deteriorate into a long contest of attrition, one which would bleed Germany to death and which, given the superior resources of France and Russia, Germany could not win (Snyder 1984, 108-109; Ropp 1959, 222).

In addition to the need to avoid a prolonged conflict, an offensive doctrine was also needed because of the structure of the Triple alliance. One of the major sources of conflict in the early twentieth century was the division of influence in the Balkans. As a result of the competition between Austria-Hungary

and Russia in this region, it was likely that in any war these two states would fight. Furthermore, given Russia's much greater military strength, it was likely that Austria-Hungary would lose. Therefore, a primarily defensive German military doctrine would result in the loss of Germany's only reliable great power ally (Sagan 1986, 163). Alliance commitments bound Germany to an attack on Russia in defense of Austria-Hungary and, therefore, to an offensive doctrine.[36]

The operational part of the Schlieffen plan centered on a wide sweeping move through Belgium and then south towards Paris (Rotherberg 1987, 317; Ropp 1959, 225). The overall objective was to force the French to fight a large battle away from their formidable frontier fortifications, where the German army would have a chance to encircle and destroy it. The destruction of the French army was expected to take eight to ten weeks, after which the bulk to the German army could be shifted east to deal with the Russians.

## 5.0 Analysis: The Dominance of Grand Strategy

The influence of technology on German grand strategy as a whole prior to the First World War was quite low. This is not because German military planners did not recognize certain

36 Similarly, the French had to plan for an attack on Germany in order to relieve pressure on the Russians. Following the same rational as the Germans, the French could not allow their Russian allies to be decimated by repeated German attacks while France did nothing. This would eventually lead to France having to face the Germans alone after Russia surrendered, the precise situation that the French had tried to avoid by allying with the Russians in the first place. The same argument dictated a Russian offensive to support the French.

technological effects, although they may well have underestimated them, but rather because of beliefs about the relationship between military planning and grand strategy. These beliefs closely reflected the mechanisms suggested by the first model. The German national defense establishment was heavily influenced by the writings of Clausewitz. The conduct of warfare obtained its guiding logic through the domination of political issues. This belief in the domination of grand strategy had a crucial impact on both the formulation of grand strategy and the role that technology played in the planning process.

**5.1 Explaining the Formulation of German Grand Strategy**

Given that both the first model and German strategy making were influenced by Clausewitz, it should not be surprising that there is a considerable amount of symmetry between the theory and actual events. The central logic of German planning was provided by the need to fight a two front war. This need, an issue of grand strategy, dictated the terms of military doctrine. As a result, there was little potential for military doctrine to influence grand strategy.

This relationship has profound implications for the understanding of technological influence. Initially, technology only affects military doctrine. This is because technological change takes place in the field of militarily significant equipment. If military doctrine is unable to influence the composition of grand strategy, then it will be difficult to argue that technology is able to influence strategy either. The relationship between doctrine and strategy in this case acted as a definite constraint on technological influences by preventing

technologically based changes in doctrine from having any influence at all at the level of grand strategy. Thus, although technological change is recognized at the level of military doctrine, its influence on planning does not extend to the level of grand strategy.

**5.2 Technology and Military Doctrine**

Several prominent authors have argued that the Schlieffen Plan, along with most of the other military doctrines of the time, did not take modern technology into account (Howard 1984; Miller 1985; Snyder 1984). Such arguments, however, either fail properly to consider the role of technology in planning or are simply erroneous. The development and proliferation of rail networks was a crucial element to the Schlieffen plan.[37] The plan was deliberately constructed around the mobilization schedules of France, Russia and Germany. The "window of opportunity" perceived by Germany was the result of the relatively slow Russian mobilization program, largely the result of an underdeveloped rail net (Lebow 1984, 150-151). Without a highly developed system of railways, it would have been impossible for the Germans to consider shifting a large portion of their army from one front to the other in the necessary time (Van Creveld 1977, 111-113). Support for this argument can be found in the reaction of strategists to the changes in the rail capacities of other states. When the Russians looked like they might dramatically increase the speed of their mobilization through better rail networks, many generals argued for a

37 Furthermore, the construction of railways in Germany was deliberately structured around the military requirements of the Schlieffen Plan. See Ritter 1958, 44-46.

preemptive war with Russia in order to preserve Germany's military doctrine (Van Evera 1984, 65; Lebow 1984, 150).

The dramatic increase in the amount of firepower available to a land army also did not go unnoticed. Schlieffen and others were very aware of the increasing costs of land warfare, in particular when attacking a prepared position. However, rather than conclude that this made attacks impossible, German military planners attempted to devise ways to avoid attacking prepared positions. German planners knew full well that a defensive position was now likely to be very strong. However, they did not conclude from this that offensive action was impossible (Ropp 1959, 224-225).

German military observers had witnessed the impact of modern firepower in the Russo-Japanese war and the Boer war, and had learned lessons from these experiences. As a result, the Germans had for years advocated flanking maneuvers instead of frontal attacks to avoid superior defensive firepower (Snyder 1984, 21; Sheffield 1988, 52). For a short period of time, under Von Moltke the elder, the entire German strategy had been based on defensive action (Rothenberg 1986, 306-307). However, with the solidification of the Franco-Russian Entente the perception among German strategists was that Germany would be unable to afford the kind of war a defensive strategy would bring.

What German military planners failed to consider was that massed artillery would make flanking maneuvers costly while mass armies and new levels of dispersion would result in a continuous front that could not be outflanked.[38] With hindsight it is clear

38 At least this was the case in France. In Russia, continuous fronts were difficult to maintain due to the vast length of the

that the perception of war held by German military strategists was not congruent with the known effects of current technology. But we must be careful not to judge too harshly based on information not available when the Schlieffen Plan was developed. To their credit, the Germans were a lot closer to reality in their perception of technology than the planners of any of the other great powers (Ropp 1959, 227). Furthermore, of all the military planners of the day, only Schlieffen showed any awareness of the implications of a drawn out war of attrition (Geyer 1986, 330). German planners did acknowledge the impact of firepower on the modern battlefield, even if they underestimated its true potential. However, they felt that to accept that offensives were impossible was tantamount to accepting defeat. Furthermore, a war in which Germany risked offensive action was thought to be less costly and more likely to bring success than one in which it relied solely on defensive action.

**5.3 Technology and the Security of the State**

In addressing the relationship between technological changes and the security of the state as a whole, it will be useful once again to examine the way in which German grand strategy was constructed. Both in the definition of threats and the formulation of policies at the level of grand strategy to meet these threats, technological change did not play an important role. Technology was not thought to have altered the essential nature of warfare, nor the relationship between warfare and politics set down by Clausewitz and the first model.

---

front, hence movement was much more prevalent and offensives by both sides frequently met with more success.

The Germans valued protection over deterrence as the mainstay of their national security. This had been the case at least since the Concert of Europe fell apart and, arguably, even before that. The important point to be made here is that preferences were based on non-technological factors, in this case the nature of the alliance system in Europe at the time. Technological changes in the twenty years prior to the outbreak of war did little to alter this bias, even though military planners recognized that the cost of war was rising dramatically.

## 6.0 Conclusion

Technology has not necessarily played a dominant role in the national security policy of the state. It is possible for the decision makers of the state to construct a rational national security policy without ever taking into account technological changes except at the level of operational military planning. This is only likely to happen, however, if grand strategy is put in a position where it dominates military doctrine, and therefore subverts the flow of influence from doctrine to strategy.

In the case of German national security planning prior to the First World War, issues of grand strategy dictated the terms under which operational military planning took place. Furthermore, the inability of military doctrine to influence grand strategy seems to have affected the role of technology in planning at both levels. Technological considerations were clearly subordinated to strategic interests. The offensive nature of the German military doctrine was the result of the need

for a quick victory on at least one front. While strategists were not blind to the strength of the defensive, they strongly felt that a war could not be won without offensive action (Snyder 1984, 20). Rather than embrace the influence of firepower, Schlieffen and others sought to get around it. This was not based on any particular mode of thinking about technology itself so much as on Germany's strategic position at the time. Germany could not win a war without an offensive strategy, therefore technological biases for the defense had to be circumvented.

What this case has shown is that technology during this period had a definite influence at the level of operational military planning. However, because of the specific circumstances involved, these changes had very little influence on the composition of grand strategy. At the same time, the affect of technology on operational military planning was sometimes indirect, and often misinterpreted or misunderstood. It seems logical to conclude that it is completely possible for technological change to have no impact on defense and deterrence, as this case has demonstrated, and as the first model suggests.

## IV/ FRANCE 1930-1940: THE DOMINANCE OF MILITARY DOCTRINE

> *A party of A Company men passing up to the front line found... a man bogged to above the knees. The united efforts of four of them with rifles beneath his armpits, made not the slightest impression, and to dig, even if shovels had been available, would be impossible, for their was no foothold. Duty compelled them to move on up to the line, and when two days later they passed down that way the wretched fellow was still there; but only his head was now visible and he was raving mad.* (Major C.A. Bill of the 15th Battalion, Royal Warwickshire Regiment, quoted in Wilson 1986, 473)

> *they remembered the horrors of the ceaseless shelling, the wounded men agonizing untended, the hideous mutilations, the runners not returning, the reliefs and ration parties not arriving, the thirst, the hunger, the stench, the misery, the fear; above all, always the shells. Privately to themselves they wondered if they could do it again, if any Frenchman could? The answer they felt was no. No human being could do Verdun again.* (Horne 1962, 340-341)

### 1.0 Introduction

The memory of the First World War greatly influenced the making of both grand strategy and military doctrine from 1918 to 1939. Building on their experience in the First World War, the French reversed the planning priorities set by the Germans in an attempt to achieve better results on the battlefield. The First World War taught the French that winning was not enough; war had to be conducted in a manner which was not exorbitantly costly. As a result, the overriding priority of French defense planning was preventing a repetition of the First World War experience. War itself, along with defeat, became a threat to the security of the state.

French perceptions about the importance of planning for warfare influenced doctrine and strategy. In contrast to the first case, it will be useful here to consider the French

military doctrine first, and then move on to examine grand strategy. This is in keeping with the structure of the second model of interaction presented in chapter one. This model views technology as affecting military doctrine, and it in turn influencing grand strategy. Once again, the goal will be to explain the influence of technology both at the level of military doctrine and of grand strategy.

## 2.0 Technological Change: Tactical Protection, Strategic Vulnerability

The change in available military technology during and after the First World War fundamentally altered the military capabilities of the state. At the tactical level, the field armies of the state were afforded a level of protection not seen in European warfare since the demise of the armored knight. At the strategic level, the state itself was more vulnerable than it had ever been before. Long range bombers and gas weapons meant that, regardless of the status of war on land, the civilian population of the state was at risk. This led to conditions of increased durability for military forces in the field and increased fragility for the civilian society that these forces were supposed to protect.[39]

### 2.1 The Technological Package

The durability of military forces was the result of extra protection through fortification, camouflage and a number of defensive obstacles such as minefields and barbed wire.

---

39 The fragility of civilian society argument is similar to that made by Herz with respect to the third case. See Herz 1959, especially chapter one.

Furthermore, time and again in the First World War the immense firepower available to entrenched troops prevented attackers from closing with defenders, further strengthening the power of the defensive. The invention and development of the armored vehicle, in particular the tank, allowed troops to move across the battlefield with relative immunity from opposing fire.[40]

While soldiers might be better protected, society was made considerably more vulnerable by technology. The development of long range bomber aircraft capable of delivering heavy bomb loads threatened to devastate civilian centers with explosives, fire and gas. Interception capabilities were such that even robust defenses were not likely to shoot down more than 5-10% of attacking bombers. The predominant belief prior to 1939 was that "the bomber will always get through" (Posen 1984, 152). Submarines and the maritime blockade threatened states with economic ruin and starvation. While the armies of the state might survive, technology had ended the direct connection between success on the battlefield and the protection of the state.

**2.2 Some Specific Technological Developments**

After 1918, technological change was not so much innovation as it was development and perfection of existing technologies. The submarine, the airplane and the tank had all been used in the First World War. However, the importance of these and other weapons to military doctrine changed dramatically from 1918 to

40 There is a built-in contradition here between the strength of the defensive due to firepower and the ability of troops protected by armor to move. However, armor attacks did not tend to lead to the kind of mass casualties seen in the past because they hit a considerably smaller segment of the enemy line. Thus, win or lose, entrenched or armored troops were better protected than their counterparts in 1914.

1939 (Van Creveld 1989, 178-179; Ropp 1959, 303-313). In the inter-war period weapons were not invented so much as they were improved (Orgill 1970; Dupuy 1980, 232-233).

Basic infantry weapons changed little during this period. The rifle and the machine gun had roughly the same capabilities in 1939 as they had had in 1914. Artillery, the most lethal weapon of the first war, also remained essentially the same (Dupuy 1987, 207-208). The tank, in contrast, was greatly improved (Orgill 1970, 110-114). By the mid 1930s tanks were fast (20-30 km/h), mechanically reliable and well armed. They also had operational ranges in excess of 200 kilometers, which gave them a great degree of flexibility and independence on the battlefield (Van Creveld 1989, 180).

Aircraft went through a process similar to that of the tank. Their combat capabilities were remarkably increased from the beginning of the First World War to 1939 (Dupuy 1980, 144). This development was particularly important in the case of bombers. Increased aircraft range and payload gave air forces the ability to strike civilian targets far behind enemy lines. Bombers were also beginning to be equipped with a formidable defensive armament, theoretically allowing them to fly over hostile territory unescorted.

Improvements in submarine technology added another dimension to strategic warfare. In the past, a maritime blockade required a large naval force to control trading routes and block enemy ports. Long range submarines, used as commerce raiders, threatened to give blockade capabilities to states that did not have the geographic or industrial resources needed for a blue

water navy (McNeill 1982, 341). The German U-19, developed early in 1914, had an operational range of 5000 miles (Brodie and Brodie 1973, 181). This range allowed submarines access to shipping lanes over a vast area. After their experience in the First World War, the German navy fully expected to fight a war of attrition against the commercial shipping of France and Great Britain.[41]

### 2.3 The Conventional Wisdom: Initial Thoughts on the Significance of Technological Change

As one might expect, the central debates about military planning between the wars revolved around the implications of armor for the land battlefield and the implications of aircraft and submarines for strategic warfare.[42] Tanks provided men in the field with a remarkable increase in mobility, if they were equipped with such vehicles. Not only were tanks fast, but they could drive through considerable amounts of enemy fire without having to take cover. Tanks had the potential simply to drive past enemy strong points, or through narrow gaps in enemy lines, without regard for defending forces (Van Creveld 1989, 179). In both England and Germany, military strategists argued that this capability offset the defensive advantage provided by increased firepower. As a result, their argument went, the next war would be one of movement rather than attrition (Liddell Hart 1925, 64-

---

41 At the outbreak of war in 1939 the German's had less than thirty ocean going boats. However, within a year they were producing advanced submarines at a rate of twenty a month (Brodie and Brodie 1973, 217).

42 In the case of submarines there was actually little debate per se, as the submarine had proved itself in the First World War. Rather the debate revolved around whether strategic warfare as such was capable of deciding conflicts.

66; Carver 1979, 37-54).

Many planners, particularly within the conservative military establishments of the great powers, did not agree with this assessment. They felt that anti-tank weapons would have the same effect on a tank attack that the machine gun had had on infantry assaults (Doughty 1988, 56; Watt 1975, 66, 69-70, 81). Despite the new mobility of mechanized units, defenders would retain a significant advantage if they fought from prepared positions. As long as the ratio of anti-tank artillery to tanks remained favorable, attacks were unlikely to meet with more success than in the First World War.[43]

The advent of long range, high payload, bomber aircraft sparked a debate that was in many ways related to the debate about the tank, although the scope of the aircraft debate was wider. Essentially the debate revolved around the impact that strategic bombing would have on the conduct of war. Prominent thinkers such as Douhet, Mitchell, and Seversky argued that bombing would be the key element of any future conflict (MacIsaac 1986, 624-634). In essence, their argument was that future wars would be waged between great air forces that bombed the industrial and civilian centers of the enemy. Poisonous gas, delivered by bombers, was expected to see widespread use. The end result of this type of campaign was expected to be the deterioration of the industrial capacity and civilian morale of one's opponents.

One view, stressing images of death and destruction

---

43 In part this was based on the experiences of the Spanish Civil War, where anti-tank guns did beat back armored attacks (Watt 1975, 66).

> raining from the skies, was that the nature of warfare would be directly and vastly changed, often with the implication that armies and navies would be rendered impotent. (MacIsaac 1986, 625).

A fundamental assumption of the airpower theorists was that a land battle would be largely static, along the lines of the First World War. In part the resort to strategic bombing was seen as a way to bypass the largely stagnant battlefield and win wars without the grotesquely costly offensives used from 1914 to 1918 (MacIsaac 1986, 633).

Theories of strategic attacks from the air were considered important in the 1930s. Not only did this solve a political problem by providing a theory of victory which did not involve huge land battles, it also greatly influenced the nature of strategic defense. In the past, strategic defense had primarily revolved around maintaining the territorial integrity of the state. In the 1930s, the state's assets were subject to a direct threat which was much more difficult to defend against. In fact, strategic air defense had never been tried before, and strategists were uncertain about the best way to go about it.[44]

## 3.0 French Military Doctrine: The Lessons of Verdun

For the French, the memory of Verdun had a lasting impact on the nature of the grand strategy formulation process. The horrors of that battle were such that the French approach to warfare changed. Verdun epitomized the First World War for

---

44 See Posen 1984, 144-146. Planning for strategic air defense was vastly different in different states. England had the most developed strategy, while France, Italy and Germany all had differing ideas about the nature of the threat and how best to combat it.

France (see Horne 1962, 336-339). It was heroic and, in the end, a French victory. However, the cost of that victory was so high that after the First World War was over a priority in French defense planning was the prevention of its repetition (Horne 1962, 337-338).

**3.1 The Discount War: French Military Planning**

New technology had a critical influence at all levels of military thinking. On land, the legacy of the First World War dominated French planning (Young 1978, 14; Nere 1975, 94-95; Kemp 1981, 15-18; Doughty 1987, 47). In general, French military planners put a high priority on avoiding the costly and pointless offensives which had almost destroyed the army in 1917 (Kemp 1981, 15-16; Doughty 1987, 59-60). The French believed that frontal assaults on prepared positions would be costly and had a low chance of success. The machine gun and coordinated, controlled artillery made movement anywhere near the front lines dangerous (Sheffield 1988, 52-55). It was concluded that the defensive was an inherently stronger military posture, particularly between large armies when there was little opportunity for maneuver.

The French were not blind to the development of the tank and its potential impact on a new war. However, they felt that the anti-tank gun would have the same effect on a tank attack that the machine gun had had on the infantry assault (Watt 1975, 66 69-70 81). Although the French army accepted the need for mechanized and armored units because of the speed with which they could move, they still expected a war to come down to a contest of attrition in which superior resources would eventually triumph

(Doughty 1988, 56). Given that offensive action was believed to require more resources, and that defensive action could be used to inflict disproportional casualties on attackers, French military planners opted for a defensively oriented doctrine.

Two major problems with a defensive doctrine determined the specific nature of French planning. Since the Germans had a much larger pool of resources on which to draw, it was feared that even with the advantage of defensive firepower, France might lose a war of attrition (Gunsburg 1979, 28-29; Kennedy 1987, 314). This was reinforced by France's inability to gain a solid alliance commitment from any of the other great powers. Without a major ally, France might lose a defensive war through sheer inferiority in resources.

The second problem with military planning was that a defensive strategy surrendered the initiative to the enemy. The Germans could pick the time and location of their attack. In order to maximize the defensive advantage troops had to have time to prepare fortified positions. Given the size of the French army it was impossible for it to cover the entire French frontier in strength. Therefore, it was feared that the Germans, well known for their preference for mobility, would outmaneuver a smaller and less mobile French army.

The Maginot line, constructed in the late 1920s and early 1930s, provided a logical solution to both of these problems. The line was, in fact, not a line at all. Instead it was a series of independent fortifications each of which was designed to withstand heavy artillery while defeating tank and infantry assaults (Kemp 1981). The line covered the border with Germany

from Switzerland to Belgium. These fortresses made the defense of the Franco-German border stronger while at the same time reducing the number of troops needed.[45] Thus the bulk of the French army would be available to meet the Germans at their point of attack (Gunsburg 1979, 13).

The Maginot line reduced the problem of initiative by more or less forcing the Germans to attack through Belgium (Posen 1984, 113; Gunsburg 1979, 13; Young 1978, 63). The Belgian and Northern French plain was the only area where fortifications were not strong enough to repel an attack without substantial support. The French expected the weakness of the Belgian border, combined with the strength of the Maginot fortifications, to force the Germans into a repetition of the Schlieffen plan (Doughty 1987, 53). The difference this time would be that the French would be expecting just such a move, and would take appropriate measures.

The overall French war plan called for resisting the initial German offensive in Belgium through the use of defensive firepower. The French hoped to establish a defensive line in Belgium similar to those seen during the First World War. In order to break the line the Germans would be forced into the kind of offensives that France and England had had to launch in World War One. Once the German army had been battered by fruitless offensives, and France and her allies had mustered their full strength, offensive action might be contemplated (Bond 1975, 46). While the German army was weakened at the front, the German state would be subjected to strategic bombing and an economic blockade,

45 The need to reduce demands on manpower was a constant factor in the construction of the Maginot fortifications (Kemp 1981, 13).

further increasing the Allied advantage.[46]

Despite the fact that Belgium had ceased to be a French ally after 1936, French commanders still planned to fight the opening battles of a war on Belgian soil (Gunsburg 1979, 126-131). The advantages of such a plan remained obvious to the French. Meeting the Germans in Belgium would move the initial lines away from Paris, keep the devastation of the war off French territory, and protect the important industrial area in the North of France. After 1937 the French high command planned to move rapidly into Belgium at the same time the Germans did, meeting them somewhere in the middle (Posen 1984, 113-114). The French viewed the new mobility of their forces primarily in the context of this plan. Mobile forces would allow the French army to penetrate Belgian territory more quickly, leading to a defensive line far from the French border.

French doctrine in the air was also greatly influenced by technology. The French air force was concerned primarily with defense against German bomber attacks, in particular the strategic bombing of industrial centers and other civilian targets. There was no centralized plan for the use of air forces in the conduct of war as a whole. Proponents of the French Air Force were concerned mainly with exclusively airborne operations, such as strategic bombing and air defense. As a result, there was little coordination between the air force and the army or the navy.[47] The French air force had little concept of ground

46 The naval blockade of Germany would be a combined operation by the French and British fleets, while the bombing campaign would be primarily a British responsibility.

47 This is also explained by the bureaucratic infighting between the respective services of the French armed forces. In

support for the army. The dispersion of fighter aircraft to counter strategic attacks led to a curious situation in June 1940, when despite being defeated thoroughly on the ground the French had a stronger air force when they surrendered than when the fighting started (Posen 1984, 133).

The French military doctrine at sea was very simple. French planners recognized the threat from German submarines, as well as the dependence of France on resources and trade from abroad. The French navy dealt with the problem by presupposing an alliance with England. In such an alliance France would take primary responsibility for the Mediterranean Sea while the British would defend the Atlantic sea lanes. Given budgetary restraints such a division of labour was considered vital by the French, who simply did not have the resources to deal with the U-Boat threat on their own.

## 4.0 Preparing For A Discount War: French Grand Strategy

By 1930 it was clear to the French that the Treaty of Versailles could not guarantee peace in Europe. Even in the years immediately after 1918, when France was the militarily dominant power on the continent, and Germany teetered on the brink of revolution, French strategists saw the Germans as their main enemy (Adamthwaite 1981, 27-28; Young 1978, 13). In part, this was due to demographic and geographic reasons. Germany was the only continental power that could present a serious threat to

---

particular the French were hampered, as were many other military organizations at the time, by the lack of a unified military command. (Young 1978, 175-177; Gunsburg 1979, 45-50, 135-136.)

France in the near future (Kennedy 1987, 304). While Germany was militarily weak as a result of the Versailles Treaty, her potential was immense (Kennedy 1987, 304). By the late 1930s the German population would be in excess of 60 million people, not counting Germans in Austria and Czechoslovakia, while France was unlikely to have more than 40 million. German industrial capacity was also much greater than that of France, and relative growth rates indicated that this gap was increasing.

French grand strategy was determined by military doctrine. The overriding logic of grand strategy, to use the term of Clausewitz, was located in the military doctrine of the state. This can be seen by the nature of threats to the French state. In addition to the traditional problem of invasion, France was threatened by a strategic bombing campaign which would destroy its urban and industrial areas, and kill its civilians. This threat, which had been recognized in the abstract since strategic bombing was first attempted in 1917, became all too real when the German rearmament program, including a vast increase in the strength of the German Air Force, became apparent. However, France was also threatened by the nature of modern warfare. The French had lost over 10% of their active male population in World War One, with four times that number wounded (Posen 1984, 107). Even a victorious war could impose seemingly unbearable costs on the state.

The French believed that future conflicts would be fought along the lines of total war (Posen 1984, 109-110). The resources of the state, in terms of industry, manpower and morale, would be taxed to the limit. Land battles would be

extremely costly, offensives would be difficult and bloody; a major war with Germany would be long, two to three years at the minimum (Young 1978, 18; Watt 1975, 69). Victory would go to the side that mustered superior resources in men and material. Economic warfare was thought to be as important as the fighting between armies (Posen 1984, 108-109; Bond 1975, 46). The priority of French planners, therefore, was to minimize the cost to France while maximizing the resources available in the event of a war.

**4.1 The French Strategic Agenda**

The easiest and most painless way for the French to maximize the resources available in the event of a war was through the formation of alliances. In the First World War the French had used Russia to balance the superior power of Germany. However, after the reconstituting of borders in 1918, Poland and Czechoslovakia separated the Soviet Union from Germany. This greatly complicated the alliance situation in Eastern Europe. By 1935, France had obtained defensive alliances with both Poland and Czechoslovakia, as well as a preliminary accord with the Soviet Union (Nere 1975, chs 10 & 11; Albrecht-Carre 1961, ch 6). However, tension between the Poles, Czechs and Soviets was high, preventing them from acting as a cohesive bloc against Germany.[48] French attempts to unite Yugoslavia, Rumania, Czechoslovakia and

---

48 This can be seen most clearly during the Munich crisis. The Poles were apathetic at best to the plight of the Czechs, as they too had their eyes set on a piece of Czech territory. Both the Poles and the Rumanians refused to allow Soviet units to cross their territory, preventing the Soviets from coming to the aid of the Czechs themselves. This despite obvious German hostility towards the Soviet Union, and Nazi claims to a substantial portion of Polish territory. (Jordan 1989, 131)

Poland into a military alliance against Germany were similarly unsuccessful (Komjathy 1976; Lee 1942, 41-43; Jordan 1989, 129-131).

The Soviet alliance was always on shaky ground politically; the Soviets greatly feared a French plot to involve them in a war with Germany. The Soviets, wishing to avoid a repetition of 1914, refused to enter into any agreement which prematurely brought them into conflict with Germany. (Nere 1975 ch 11 & pg 210) As well, the Soviet military had suffered greatly from a number of purges in the late 1930s. By the end of the decade there was great doubt as to the effectiveness of the Soviet military, even if a political commitment could be obtained (Nere 1975, 210). Without the Soviets, Poland and Czechoslovakia were considerably less useful to the French. On the one hand, they did possess considerable military strength, and could divert a portion of the German army in the case of a war.[49] Yet neither state was likely to be able to attack the German rear in the case of a Schlieffen-like assault on France. Furthermore, the French commitment to defend these states lacked credibility. The French military refused to seriously consider offensive action after 1934. Furthermore, it was also incapable of sending direct aid to the East. (Jordan 1989, 152-154).

The French system of alliances with Eastern European states was only likely to be effective in a war where Germany deployed much, but not all, of her force in Central Europe. This would allow the French some options in the West without leading to the

49 The Czechs fielded about 40 divisions in 1938, just over half the German total. On the whole they were well equipped and their morale was high.

premature collapse of Czechoslovakia or Poland. The continued rearmament of Germany effectively ended this strategy by intimidating the French to the point where they were no longer willing, or able, to maintain their alliance commitments (Jordan 1989, 154).

Throughout the 1930s the French tried to bring Great Britain into a firm alliance against Germany (Nere 1975, 196). The British had specialized assets that were crucial to the French military doctrine. British interceptors were needed to counter the German air force, while the British navy was needed to blockade Germany and ensure a continuous flow of goods to France (Adamthwaite 1977, 162-165). However, the memory of the First World War was as strong in London as it was in Paris. So long as Germany did not appear to be a direct and immediate threat to France the British were unwilling to become involved in an alliance with the French. When the threat became overt, as it did during and after the Munich crisis of 1938, military cooperation began between the two. It was only as war actually approached that the French were able to elicit a military commitment from Great Britain (Nere 1975, 225; Bond and Murray 1987, 100).

Due in part to the reluctance of the British to ally with France, Belgium was crucial to French grand strategy and military doctrine. Until 1936 France and Belgium were military allies, however the rise of Hitler and German belligerence led the Belgians back to their traditional position of neutrality, in the hopes of avoiding a repetition of their World War One experiences (Nere 1975, 202-205). The French, in contrast, were determined

to draw the Belgians into a war. By fighting on Belgian territory, rather than in France, the inevitable collateral damage that accompanied modern warfare could be kept away from France. An alliance with Belgium would also bring over a million men of military age to the French side. If a substantial part of Belgium remained out of German hands a large Belgian army might be maintained in the field. This army would conduct operations and sustain casualties that otherwise would have had to come from French forces (Posen 1984, 238). Most importantly, an invasion of Belgium would force Great Britain into the war, if she were not already committed. This would bring another large army to the field, which would further reduce the overall costs to France.

As the pattern of alliances shows, French strategy was quite clearly defensive. French military doctrine held that a war would be long and bloody (Young 1978, 16-22). French strategy responded to this by attempting to maximize the defensive strength of the French position through alliances and fortifications.

Given their perception of the costs of war, the French placed a high value on deterrence policies. Unfortunately, their military doctrine did not provided them with the necessary tools for a successful policy.[50] The French military doctrine dictated a policy of defensive protection; offensive action was much too

---

50 Deterrence was used effectively in 1934 with repect to German claims on Austria, however this was only accomplished with the assistance of determined allies, in particular Italy. After this point, deterrence became largely ineffective and as such did not form a major element of French strategy (Lee 1942, 95-98; Albrecht-Carrie 1961, 262).

costly to be undertaken at the outset of a war. The only deterrence option open to French strategists was deterrence through denial. This made extended deterrence difficult, if not impossible. The fact that France might be difficult to conquer had little influence on the German decision to threaten Czechoslovakia.

While the Germans could not be deterred, they might well be defeated. The protective strategy of France was both logical and well thought out. The military doctrine was highly responsive to technological change, as was grand strategy. That the French understanding of technology was completely wrong does not alter the fact that planners were responsive to change. The French notion of war as a battle of attrition was based on technology and the experience of the First World War (Posen 1984, 106-107). The plan to move into Belgium after that country withdrew from its alliance with France in 1936 was based on the new mobility of armored and mechanized forces. The issue of success cannot be allowed to divert attention away from the sensitivity of the strategic agenda to technology. It is this sensitivity that separates France in 1930 from Germany in 1900.

## 5.0 Analysis: Technology and the Dominance of Military Doctrine

French strategic thinking prior to the Second World War operated in a fundamentally different manner from German thinking before 1914. The difference between the two cases revolves around the importance of technology to planning. For the French, military doctrine became a dominant factor in the process of

grand strategy formulation. This follows the prediction of the second model. As the French military doctrine was highly sensitive to technological change, there was in existence a process whereby technology affected military doctrine and that doctrine, in turn, affected grand strategy. The logic which drove planning was no longer dominated exclusively be political factors. The influence of technology, in particular the high costs of modern warfare also structured planning at the level of military doctrine.

### 5.1 Technology, Military Doctrine and the Second Model of Interaction.

In the first case, German strategy making followed a top-down approach, whereby issues of grand strategy tended to dominate those of military doctrine. The second model suggests that military doctrine can, in fact, influence grand strategy. In this model, grand strategy and doctrine are able to influence each other. The example of French security policy fits this model well.

Prior to the Second World War, military doctrine had a significant influence on French grand strategy. It did so due to a commonly held perception in France that military planning was the preeminent factor for national security. In the past, military planning had been important because faulty planning might lead to the military defeat of the state. However, after the First World War, the importance of military doctrine rose with the perception that warfare threatened the state regardless of who won. Warfare itself had become a threat to the state, as opposed to simply defeat.

The dominance of military doctrine was demonstrated by the fact that doctrinal issues greatly influenced the nature of the strategic agenda. Alliances were constructed, and in the case of Czechoslovakia, abandoned, on the basis of military realities. The preference for deterrence, as well as its abject failure, was determined by military doctrine. Perceptions about the use of force and the relative merits of offensive and defensive action were all conditioned by a notion of warfare that had its roots in the military doctrine.

Therefore, while some threats to national security continued to be located in competitor states, other threats arose through the conduct of warfare, ie the military doctrine of the state. This is crucial to the understanding of the rising importance of technology to national defense planning. So long as military planners remain responsive to technological change, technology and doctrine will rise in importance simultaneously. In the case of France, military planning was influenced by beliefs about mobility, fortifications and the effect of firepower on the battlefield. This, in turn, led French planners to believe that the next war would be one of attrition, rather than maneuver. This belief directed much, if not all, of French grand strategy.

## 6.0 Conclusion

For Clausewitz, war had to be subordinated to policy, as it was policy that gave logic to the conduct of war. For French strategists, policy had to be subordinated to war; the cost of subordinating war to policy had proven too high between 1914 and

1918. This accounts for the difference between the two explanatory models, as well as the difference between the policies of Germany in the first case and France in the second. The single greatest result of the First World War was that in its aftermath, security planners ceased to consider warfare simply the continuation of policy by other means. Whereas in the past military doctrine had been perceived exclusively as a mechanism through which threats to the state could be countered, after 1918 decision makers had to face the fact that threats could originate within doctrine itself. The new importance of doctrine also marked a major leap in the importance of technology. Technological change was responsible for the increased destructiveness of war in the first place. As well, military planners sought to counter the problems presented by technology with technology.

The traditional threat to the state, armed invasion, could be countered with diplomacy, traditional military resources or military innovations which might or might not involve technology. Therefore, in the first case it was possible to present a rational policy for the security of the state that to a large extent ignored the impact of changes in technology. However, the destruction of war, due to technology, could only be countered by further technological innovations. Once deployed, more destructive weapons systems could not be ignored or removed. The only option available to states was to seek even better technology to deal with the increased destructiveness of weapons. However, it would be wrong to suggest that the new threat that arose during the inter-war years dominated the other threats in

the international environment. The threat of a bloody war of attrition conditioned French planning, however the end goal was still victory in a war. It would take the invention of nuclear weapons to make the threat of war the dominant factor in national security planning.

## V/ THE UNITED STATES 1960-1969: TECHNOLOGY AND THE PROBLEMS OF STRATEGIC PARADOX

> *I just could not understand why our surroundings had changed so greatly in one instant...I thought it might have been something which had nothing to do with the war- the collapse of the earth, which it was said would take place at the end of the world, and which I had read about as a child.* (Yoko Ota, writer and Hiroshima survivor, quoted in Schell 1989, 272)

> *Thus far the chief purpose of our military establishment has been to win wars, From now on its chief purpose must be to avert them.* (Brodie 1946, 76)

### 1.0 Introduction

Nuclear weapons fundamentally altered the very roots of the national security problem. For the first time in history, states were faced with the possibility of almost instantaneous devastation, against which there was no defense. In understanding the full impact of nuclear weapons on national security policy, it is necessary to consider the third model of interaction. It is through this model that the dramatic and revolutionary affect of nuclear weapons can best be illustrated.

This chapter represents the culmination of the trends identified in chapters two and three. Technological change was, by 1960, the dominant factor in national defense planning. Nuclear weapons and their delivery systems defined the terms within which grand strategy and military doctrine could operate. Furthermore, the rapid pace of innovation made technology even more important. Significant, if not crucial, advantages could be gained by the state that maintained even a marginal lead in technological development.

## 2.0 New Technology: MAD and Unresolvable Vulnerability

This case will examine changes in U.S. policy between 1960 and 1969. Therefore, relevant technological change will be that that took place between 1940, when the second case ended, and the early 1960s, when grand strategy and military doctrine were being devised. It will be necessary, to a degree, to divide change into sub-areas within this period in order to understand the progression of the nuclear revolution.

### 2.1 The Technological Package

The technological package in the 1960s placed the state in a situation of unresolvable vulnerability. Regardless of technological innovations, clever military planning or superb diplomacy, there was nothing that decision makers could do to prevent an enemy from totally destroying the state and its assets, either through an attack or retaliation, if it chose to do so.[51] While conventional warfare remained basically unchanged from the form it took during the Second World War, strategic warfare changed dramatically. Bombers and missiles armed with nuclear weapons altered the whole notion of offense and defense in international relations (Quester 1977, 156-157). In the past, it had been possible to argue that either offensive or defensive military action had some form of advantage; by the 1960s it was clear that offensive technology had rendered defensive action meaningless (Brodie 1959, 200-202). In the 1930s the axiom "the bomber will always get through" provided the rationale for fears

51 In keeping with the previous chapters, this case deals only with the great powers of the time, in this instance the nuclear superpowers.

of strategic bombing. However, as the Second World War showed, the bomber getting through was not enough to destroy a state. Once the bomber was armed with a nuclear warhead, however, the state was subject to threats from which there was no escape.

**2.2 Specific Technological Changes**

Conventional weaponry changed little during this period. While the capabilities of equipment were improved, few significant innovations were developed. New aircraft were faster, better armed and had longer ranges. Tanks were better armored and had longer ranged guns (Dupuy 1987, 208-209). Strategic mobility was also greatly enhanced, primarily by the development of huge transport aircraft that could move men and supplies huge distances in a very short period of time (Haffa 1984, 29-30). On the whole, however, the armed forces of the 1960s did not look markedly different from those of the Second World War. Principles of organization, as well as basic tactics, remained the same. For example, the tanks of the era may have been better than their predecessors, however, they remained essentially the same type of fighting vehicle, with the same role (Liddell Hart 1960, 177).

The same cannot be said for strategic weaponry. While nuclear weapons did make an appearance in the Second World War, their impact on the eventual outcome of that conflict was marginal at best.[52] Their influence on international politics in the post war period, on the other hand, was very great (Hertz 1959; Jervis 1989; Mandelbaum 1979). Due to the destructive

52 Marginal in the sense that the victors in the war had already been decided, and the only role left to nuclear weapons was with respect to the length of the conflict (Keegan 1989, 575-585).

nature of nuclear weapons, one reasonably accurate warhead was likely to destroy all but the most hardened and protected targets (Rumble 1985, 130-134). Current methods of delivery were such that many warheads could be expected to arrive on target in the event of a war. Strategic targets could be attacked by long range bombers or ICBMs, while operational or tactical targets could be hit by a plethora of battlefield delivery systems (Brodie 1959, 173-180).

By 1965, Submarines, armed with nuclear missiles, could not only remain at sea but could actually remain submerged for months at a time (Scoville 1972, 31). This had profound implications not only for the conduct of conventional warfare but also for nuclear planning. Missile carrying submarines became virtually invulnerable, as they were impossible to locate or track reliably (Scoville 1972, 30-31). This provided the great powers with a retaliatory capability which could not be defended against, as launchers could not be destroyed, and the missile could not be intercepted.[53] The invulnerability of missile submarines formed the cornerstone of mutually assured destruction.

Another important area of new technology was in the field of communications and reconnaissance. Advanced communications

---

53 The lack of defense against nuclear weapons was due to the fact that defensive systems, while capable of interdicting or suppressing many launchers, were nowhere near 100% effective, nor were they likely to be at any time in the reasonable future. Most air defense networks, for instance, could not destroy more than 25-40% of an attacking force, at the most. In a conventional war this was acceptable because many attacks would be needed to destroy a target, and any attacking force suffering 25% casualties over a number of attacks would rapidly cease to be effective. Given the destructiveness of a single nuclear weapon, such a scheme was practically irrelevant (Brodie 1959, 191-202; Drell and Panofsky 1984, 313).

allowed for near instantaneous information relays around the world. This was best displayed in the case of the Hot Line between Moscow and Washington, set up after the Cuban Missile Crisis, which allowed the Soviet and American leaders to speak directly to each other in times of crisis. (Blechman 1988, 469-471) Photographic reconnaissance satellites were also militarily important, as they provided information on enemy dispositions and force structure which was vital to rational planning. With the development of such satellites, predictions about the capabilities of ones' opponents could be made with much more certainty than in the past, avoiding the mistakes that had been made as a result of the "Bomber" and "Missile" gaps in the 1950s (Gaddis 1988, 357-359). The change in technology, then, was nothing short of revolutionary. As authors such as Bernard Brodie suggested as early as 1946, its impact on strategy was expected to be no less spectacular (Brodie 1946).

### 2.3 Nuclear Weapons and Conceptual Changes in Strategy and Doctrine: A First Cut.

Part of the nuclear revolution was the need to reconceptualize certain key elements of national security policy. As with other technological changes, nuclear weapons led to changes in both military doctrine and grand strategy. However, they also led to fundamental changes in key security concepts which had not previously been subject to the influence of technology.

Hertz has argued that nuclear weapons and modern delivery systems put an end to the impermeability of the state:

Total war, as distinguished from both kinds of

> traditional war, limited and unlimited, is involved with developments in warfare which enable belligerents to overleap or by-pass the traditional hard-shell defense of the state. As soon as this happens, the traditional relationship between war, on the one hand, and territorial sovereignty and power, on the other, is altered decisively. (Hertz 1959, 97).

The vulnerability of the state had immense consequences for the use of both deterrence and protection strategies. In extreme cases, there was no longer any method for protecting the state from an all out attack. This not only put more emphasis on deterrence, but it simultaneously made the use of threats more difficult. Under the traditional notion of deterrence, the state could not only threaten to punish an opponent, but it could also threaten to make itself invulnerable to coercion. The fact that this invulnerability had disappeared created major problems for deterrence credibility. A threat which carried with it the seeds of one's own destruction was simply not believable. This was particularly the case with respect to extended deterrence, where the activities that the state hoped to deter did not directly threaten its security.

The notion of vulnerability must be conditioned by the invulnerability of the great powers to traditional threats. While both the United States and the Soviet Union faced a situation of mutual, unresolvable vulnerability because of their nuclear arsenals, these same arsenals made them invulnerable to conventional invasions or coercion which had traditionally been at the heart of the security problem for great powers.

By the 1950s, the physical invasion of the United States was no longer an issue for security planners (Art 1991, 11). Quite aside from the geographical difficulties involved, the American nuclear arsenal made a conventional attack extremely unlikely.

However, many threats perceived by the Americans did not directly relate to the physical security of the United States itself.[54] To understand how the state dealt with this new situation it is necessary to first consider early nuclear planning, followed by a more in-depth examination of American strategy in the 1960s.

## 3.0 American National Security Policy in the Early Nuclear Age

While changes were taking place at the conceptual level of national security policy, it took some time for these changes to have any influence over actual grand strategy and military doctrine. The initial American response to the nuclear revolution was to attempt to make nuclear weapons fit with traditional notions of security and security planning. Old notions of both deterrence and protection still prevailed at the planning level.

The American grand strategy of the 1950s revolved around the concept of containment. The primary threat to the United States was the spread of Soviet power and influence on a world-wide basis, rather than an actual physical invasion of the continental United States (Gaddis 1982, 201). The primary goal of American security policy as a whole was, therefore, the containment of Soviet power and influence to the areas where it already was in control.

The American military doctrine in the 1950s revolved around

54 Art has even gone so far as to argue that issues such as the security of Europe and Asia did not relate to American security even indirectly, and that the American commitment to the defense of these areas had nothing to do with the security of the United States itself (Art 1991, 18).

the concept of massive retaliation. Under massive retaliation, if the Soviet Union made an aggressive move against American forces somewhere in the world, the United States would respond with a massive nuclear bombardment of the Soviet Union and its Communist allies (Rumble 1985, 47; Ball 1986, 62). There was no latitude for discrimination among the Communist states, and no options for anything less than an all out attack (Sagan 1989, 28). The Communist bloc was believed to be deterred by the massive amount of damage that they would sustain if an all out nuclear attack was launched. The SIOP, the planning document which coordinates American nuclear targeting, reflected massive retaliation by presenting a targeting structure which was highly inflexible.[55]

Massive retaliation was possible because the Soviet Union lacked a nuclear retaliatory capability. This allowed American military planners to consider nuclear weapons along conventional lines, as they themselves did not have to face the consequences of a nuclear attack. Therefore, traditional notions, in particular the impermeability of the state, were still held to be an important and viable element of grand strategy. While massive retaliation sought to use deterrence to ensure the security of the United States, it also relied on the premise that if deterrence failed the protective element of the doctrine could be used to solve the security problems of the state (Sagan 1989, 20-25). Therefore, if the Soviets were not deterred, the United States could protect itself through an offensive protection

---

55 SIOP is an acronym for Single Integrated Operational Plan (Sagan 1989, 25-26).

strategy involving the elimination of the threat through strategic nuclear attacks.

The ability of the United States to remove the Soviet threat through military action gave rise to a argument for preventive nuclear war (Trachtenberg 1991, 17-25). The logic behind this argument was that sooner or later the Soviets would develop the strength to match the United States, and that, therefore, the United States should attack while it still held a decisive advantage.[56] While the notion was not part of official policy, it did have some followers in the defense establishment. Furthermore, the was a common perception within the Kennedy administration that massive retaliation did require a strategy of preemption in times of crisis. Therefore, it was not until the 1960s, when members of the Kennedy administration began to rethink both grand strategy and military doctrine, that the influence of nuclear technology on national security planning attained its true level of importance.

## 4.0 The Kennedy Administration, Grand Strategy, Containment and Flexible Response: Everything is Important

When John F. Kennedy was elected President of the United States in November of 1960, he and his Secretary for Defense, Robert McNamara, brought to office a desire to revise American defense planning along rational and analytically based lines

56 In fact, as Trachtenberg notes, there was considerable concern that the Soviets were capable of a preemptive attack during the 1950s. This demonstrates, on the one hand, that weapons technology had not yet created the conditions for MAD, while at the same time indicating that planners were not yet psychologically prepared to accept assured destruction either (Trachtenberg 1991, 17-26).

(Murdock 1974, 44-45; Palmer 1978, 3-10). With the rise of Soviet nuclear capabilities, Kennedy felt that the United States required both a new grand strategy and a new military doctrine (Kahan 1975, 74). Kennedy was unhappy with the nuclear planning of the previous administration. He felt that it was dangerous, unresponsive to changes, both in the Soviet Union and the world at large, and that it was likely to be ineffective in the future (Gaddis 1982, 202-205).

The strategy of massive retaliation was perceived to be flawed both because it was unable to contain the expansion of Soviet influence and because it did not recognize the realities of the nuclear balance. Once the Soviets obtained a retaliatory capability, the reliance on an all out nuclear strike became dangerous. The strategy of massive retaliation was considered both inflexible and unlikely to succeed. The biggest weakness lay with the strategy's lack of feasible options, should deterrence fail (Gaddis 1982, 203; Ball 1986, 62). In particular, massive retaliation was considered incapable of dealing with the spread of Communist governments in the Third World. Threatening the entire Communist bloc with nuclear devastation over such an issue was not credible, even during the US nuclear monopoly; once the Soviets began to gain a retaliatory capacity it was not only incredible, but also dangerous (Rumble 1985, 49).

At the heart of Kennedy's desire to revise American national security policy was the belief that threats to American security had changed. While the source of threats, basically the expansion of Soviet power, had not changed, the methodology

behind the Soviet threat had. Nuclear weapons divided threats to the state into two categories, nuclear and non-nuclear. Nuclear threats held the potential for massive destruction on both sides of the conflict. The recognition of mutually assured destruction by the Americans in 1963 marked both the end of any practical notional of winnable total war and the acceptance of the new concepts associated with nuclear weapons. Under MAD, the greatest threat to the state was a nuclear war, regardless of the political issues and irrespective of any notion of winners and losers (Jervis 1989, 96-97).

Threats to the security of the United States also existed at levels below that of strategic nuclear war. The Kennedy administration believed that the security of the United States was directly linked to the "preservation of diversity" in international politics (Gaddis 1982, 201). In more plain language, this translated into the preservation of non-communist governments which would not align with the Soviets against the United States. Threats were, therefore, conceptualized in a global sense. (McNamara 1968, 5-8)

**4.1 Flexible Response as a Grand Strategy**

The term flexible response has been used to refer to both the grand strategy and the military doctrine of the United States during this period (See Gaddis 1982, chs 7-8). In this chapter, it will be used to refer to the grand strategy rather than military doctrine. The concepts associated with flexible response influenced military doctrine through grand strategy, rather than independently of it. Flexible response originated with a group of academics and strategists based at the RAND

corporation in California (Kaplan 1983; Brown 1983, 161-163). In the 1950s, writers such as Bernard Brodie and Herman Kahn put forward arguments about controlled escalation and the possibilities for limited nuclear war that provided the logic for both the strategy of flexible response and its military doctrine (Brodie 1959; Kahn 1965).

Flexible response arose as an alternative to massive retaliation, based on offering policy makers a wide variety of options which could be tailored to the specifics of a given situation (Brown 1983, 162-165). The masterminds of flexible response assumed that both the United States and the Soviet Union could be relied upon to act rationally in a conflict situation. Given this assumption of rationality, strategists planned to be able to analyze any given conflict and prescribe a policy which could lead to a U.S. victory (Palmer 1978, 3-5). While Kennedy and his advisors rejected the methods of retaliation, they never considered revising containment as an overall policy objective. Instead, they sought a more rational set of methods through which the Soviets might be contained.

Flexible response introduced the notion of distinct levels of conflict (Freedman 1981, 233-234). In the past, there had been a recognition that war could be conducted at different levels of intensity, however there was no real theory of limited war until the late 1950s.[57] Nuclear weapons put a priority on

57 Clausewitz discussed the possibility of conducting wars a varying levels of intensity, depending on the political stakes. However, there was little consideration in his work for the possibility that the stakes of warfare might be raised by technology, rather than politics (Clausewitz 1976, 78-81). The theory of limited war as it is understood today was first laid out by Robert Osgood in 1957 (See Osgood 1957, also Garnett 1975).

thinking about limited war because of the costs of a "total" war (Osgood 1957, 4-5). Since the threat of a nuclear holocaust existed congruently to the threat of Soviet expansion, American strategists had to develop a method for contesting Soviet moves without necessarily risking nuclear war. Therefore, they sought to meet the Soviets at lower levels of conflict and to keep them at these levels if at all possible. The theory of limited war and levels of conflict provided them with a method for doing so:

> Limited wars were to be fought for ends far short of the complete subordination of one states will to another's, using means that involve far less than the total military resources of the belligerents and leave the civilian life and the armed forces of the belligerents largely intact. (Osgood 1979, 3)

The notion of levels of conflict, then, became a defining factor in grand strategy.

Flexible response was a strategy of pragmatism. Its primary goal was to structure international conflict; this would do two things. First, it would allow American strategists to properly allocate resources, matching actions with the appropriate levels of conflict. Second, by structuring conflict, and dividing it into distinct levels, it was hoped that the United States could exert some control over the escalation of conflict.[58]

Another important aspect of the strategy was the interconnection between nuclear and non-nuclear forces. It was

---

58 Escalation at the level of grand strategy was not limited to military action. Instead, escalation could also refer to diplomatic pressure, alliance building or other political activities. Part of the flexible response strategy involved meeting social and ideological threats with social and ideological methods. Povery had to be combatted with economic aid. The acceptance of Communism as a global challenge entailed the acceptance of means and ends not previously associated with national defense planning (Gaddis 1982, 225).

quite possible, under flexible response, that an opponent who was stymied at one level of conflict might seek victory by moving up to another level, presumably where he held an advantage (Kahn, 1965). This reinforced the need for the United States to be superior at all possible levels. If this were the case, then there would be no incentive for the Soviets to escalate. On the other hand, if the United States faced a difficult situation, it could escalate or threaten escalation to provide a favorable settlement (Kahan 1975, 90-91; Gaddis 1982, 231-232).

**4.2 The Strategic Agenda**

The role of alliances changed substantially from 1930 to 1960, although they remained an important element of grand strategy. The key purpose of alliances in the 1960s was to allow the United States to incorporate other states into its overall containment strategy vis a vis the Soviet Union (Gaddis 1982, 153-154, 223). In a limited sense, alliances both maximized power and deferred the costs of containment (See Osgood 1968, 22-23). However, neither of these goals was central to the alliance system. The American alliance with South Vietnam, for instance, was actually a net loser in terms of military power and costs, because it required a substantial military commitment from the United States simply to survive. By incorporating states into an alliance, the U.S. established a foothold from which it could contain the Soviets (Gaddis 1982, 153-154). American involvement in these alliances differed, depending on perceptions regarding the appropriate level of conflict (Osgood 1968, chs 4 & 5). Therefore, in Europe the United States sought to extend its nuclear deterrent to cover the NATO countries, while in South

East Asia more limited involvement was deemed appropriate.[59] The common theme to all of the alliances made or used during this period was that they all encouraged opposition to the Soviet Union and allowed the United States to become involved to the degree that it felt was necessary.[60]

The methods by which the U.S. sought to defend its allies were largely the result of a paradoxical view of the use of force. While the overall strategy sought to enhance deterrence, and therefore avoid the use of force, the general perception among the architects of flexible response was that in order to do this, the United States had to be willing and able to use force at any time (Garnett 1975, 116). The goal of avoiding total war was perceived to be possible only if the state was willing to risk limited wars under certain conditions (Brown 1983, 162).

Given this view of force at the level of grand strategy, the orientation of flexible response was bound to be defensive.[61] As military and technological factors supported deterrence, the most rational goal for American grand strategy was the containment of the Soviet Union. Mutual assured destruction negated the possibility of significant offensive action at the level of grand

---

59 Limited in the sense that it was lower on the ladder of escalation. While the United States eventually became very heavily involved in the war in Vietnam, extended nuclear deterrence was never considered appropriate for this theatre.

60 Osgood argued in 1968 that this had been the case in the past and that the United States had to concentrate on keeping commitments in line with appropriate responses in the future (Osgood 1968, 158-159).

61 At least with respect to the Soviet Union. In the case of intervention in the Third World some activities undertaken under flexible response were highly offensive vis a vis the specific countries in question.

strategy. The fear of nuclear war changed the relationship between deterrence and defense for national security planning. Deterrence was the dominant factor in flexible response (Gaddis 1982, ch 6; Freedman 1981, 232-234). The basic goal of flexible response was to strengthen the credibility of deterrence (Brown 1983, 162-163).

Protection also changed dramatically as a result of nuclear weapons. Mutually assured destruction was based on the principle of mutual and unresolvable vulnerability; defense in the traditional sense no longer existed (Jervis 1989, 79). In theory, the state could be protected by a preemptive strike on the nuclear arsenal of ones' opponent, if this strike could be reasonably assured of destroying all or most of the enemy's nuclear weapons. However, the development of the missile carrying nuclear submarine ended, once and for all, the potential for a preemptive first strike. Protective measures were still useful for defending American interests abroad, particularly in areas where the stakes were not high enough to warrant nuclear escalation, such as Vietnam (See Herring 1979; Karnow 1983). However, protective measures were limited to areas where the stakes involved, and therefore the risk of nuclear war, were relatively low.

Flexible response eliminated the clear distinction between deterrence and defense.[62] In the past, the two concepts could be separated by the actual use of forces in action. Generally, once military forces had been used, one could argue that deterrence

---

62 Although many strategists and political scientists continue to think in these terms. See Snyder 1961 for one example.

had given way to defense (Snyder 1961, 3-5). However, under the different levels of action that made up the flexible response strategy, armed forces could be used actively in combat in pursuit of deterrence as well as defense. To understand why this is so it is necessary to consider the operational military aspects of flexible response.

## 5.0 Flexible Response and Military Doctrine: Everything is Connected

The military doctrine for flexible response was created specifically to meet the needs of the grand strategy. It was, in essence, a blueprint for how the U.S. military could meet military threats at all levels of conflict on a global scale (Gaddis 1982, 214-215). Because the whole object of flexible response was to divide issues into different levels, it will be useful to consider the military doctrine associated with the strategy as a series of levels of military action. These levels were: one, strategic nuclear war; two, large scale conventional war; and three, unconventional war. Within each major level there were then a number of sub-levels, depending on the specific situation and the resources at hand.

### 5.1 Strategic Nuclear War

The credibility of massive retaliation was weak for two reasons. First, most Soviet moves were expected to come at a level far below that of total nuclear war (Gaddis 1982, 214-215; Freedman 1981, 230; Brown 1963, 163). The threat to respond to a limited war, guerrilla conflict or even a full scale conventional war with nuclear weapons was simply not believable. Second, as

the Soviet nuclear arsenal developed, and the strategic relationship between the superpowers approached that of mutually assured destruction, the ability to the United States to devastate the Soviet Union without suffering similar damage in return became extremely tenuous (Buzan 1987, 146).

American strategists hoped to reintroduce credibility into their military doctrine by widening the range of options available to the President in the event of a war. In order to do this, it was believed, the American military doctrine had to include planning for the rational prosecution of a nuclear war. If the Soviets believed that American strategists were prepared to fight a nuclear war, they would be deterred from ever starting one. Furthermore, the threat of controlled nuclear escalation could be used both to limit and control a nuclear war and to achieve goals below the level of nuclear conflict (Smoke and George 1974, 31).

Robert McNamara, the Secretary for Defense under Kennedy and Johnson, was chiefly responsible for overseeing the development of nuclear planning in this period. McNamara presided over both a radical revision in nuclear targeting, and a massive buildup in equipment. In the first few years of the Kennedy administration, McNamara revised the SIOP in order to provide the United States with a more flexible war fighting plan. Initially, McNamara wished to follow a "no cities" targeting program.

> The US has come to the conclusion that to the extent feasible basic military strategy in a possible general nuclear war should be approached in much the same way that more conventional military operations have been regarded in the past. That is to say, principal military objectives, in the event of a nuclear war stemming from a major attack on the Alliance, should be the destruction of the enemy's military forces, not his

civilian population. (McNamara 1962)

Under this program, the United States would seek to hit military targets in the Soviet Union, rather than civilian centers (Martel and Savage 1986, 11). This would allow the United States to hold Soviet cities hostage during a nuclear war, hopefully providing the Americans with bargaining leverage with which they could end the conflict.

> The very strength and nature of the Alliance forces makes it possible for us to retain, even in the face of a massive surprise attack, sufficient reserve striking power to destroy an enemy society if driven to it. In other words we are giving a possible opponent the strongest possible incentive to refrain from striking our own cities. (McNamara 1962)

In order for this sort of a scheme to be effective, the United States had to be able to absorb a Soviet first strike and still have enough strategic capability not only to strike back but actually to exert controlled pressure over time to force a Soviet surrender (McNamara 1962; Martel and Savage 1986, 10-11; Ball 1986, 64n). It was also hoped that the Soviets could be encouraged to follow a complimentary targeting doctrine, thereby minimizing the damage to American cities (McNamara 1962). Despite this apparent relapse into Clausewitzian thinking, McNamara could not avoid the consequences of MAD, and therefore had to retreat somewhat from a pure warfighting strategy by the mid 1960s (Sagan 1989, 34-37).

To fight a nuclear war, a more diverse and advanced nuclear arsenal was needed. More accurate weapons were needed to hit military targets effectively. As well, given the vast number of possible military targets, combined with the desire by McNamara and others to maximize flexibility in nuclear targeting, many more weapons were required. By the end of the Johnson

administration the American strategic nuclear arsenal had climbed from 3127 to 4736 warheads (SIPRI 1990, 23).

Flexible response illustrates one of the fundamental paradoxes of nuclear planning in general. It revolves around the need, on one hand, to recognize and deal with the condition of MAD, and on the other hand, the need to be prepared to fight and win a nuclear war in order to enhance deterrence credibility. The contradiction between these two issues was not lost on American planners. However, because of the situation in Europe and elsewhere it was a difficult one to resolve.

**5.2 Extended Deterrence in Europe**

One of the primary reasons that American planning had to accept the MAD versus war fighting paradox was because of the problems of extended deterrence in Europe. American military planners wanted to use controlled escalation to deter a Soviet attack on the NATO alliance (Rumble 1985, 54; Cimbala 1987). In theory, according to the flexible response strategy, the threat of a conventional attack in Europe should have been countered with a conventional defense. Only if this defense failed would the United States use the ladder of escalation to force a favorable outcome.

In practice this was somewhat difficult to implement.[63] There was a strong perception among NATO states that the Soviet

63 Despite the lack of faith in a conventional deterrent, US conventional forces were strengthened under Kennedy, primarily in order to enhance deterrence credibility as per the flexible response doctrine. While this effort may have convinced some people that a war would not have to escalate to the nuclear level immediately, few strategists, on either side of the Atlantic, believed that NATO could defeat the Soviets in a purely conventional contest (McNamara 1962; Kaufman 1982, 5-6; Kahan 1975, 76-77).

advantage in conventional forces was so great that a conventional strategy was not likely to be fruitful (Brown 1983, 176). Therefore, the link between conventional and nuclear capabilities in NATO had to be reinforced in keeping with the concept of a ladder of escalation (Kahan 1975, 92). Tactical nuclear weapons were used to link the American strategic arsenal to the conventional balance of forces on the ground in Europe (Sagan 1989, 378-39). In the event of a Soviet invasion the initial defense would be purely conventional. If this failed, then the limited use of nuclear weapons would begin. A gradual upward escalation would be used to exert pressure on the Soviets, forcing them to concede.[64] Once again, it was hoped that control of the ladder of escalation could be used to force a political settlement before the war reached the level of strategic counter-city strikes.

**5.3 Escalation Dominance and Flexible Response in the Third World.**

Outside Europe, similar notions of escalation dominance were used to deal with threats in the Third World. Kennedy and his advisors recognized that military action in the Third World was likely to take new and unconventional forms (Gaddis 1982, 216; Karnow 1983, ch 7). Rather than attempt to deter or meet such action with traditional responses, as massive retaliation had, Kennedy sought to meet unconventional threats with unconventional responses. In keeping with the concept of flexible response, the

---

64 McNamara was determined to retain limited nuclear options in Europe. One of his main changes to NATO nuclear doctrine was to make the proposed nuclear response initially very limited. From this point forward the response would always be both controlled and restrained (McNamara 1962; Sagan 1989, 39).

key elements to the Third World section of U.S. military doctrine were flexible options, controlled pressure through the ladder of escalation, and initially symmetrical response to new threats. In practice, this amounted to a plan whereby the United States would meet low intensity conflict with symmetrical responses; if such action failed, then military planners had the option of escalating to the next level of conflict (Gaddis 1982, 243-246).

The war in Vietnam is possibly the best example of how this worked in practice.[65] In Vietnam, American strategists identified the initial problem as a guerrilla insurgency. Therefore, the initial response was a counterinsurgency program (Herring 1986, 78). However, when this program failed, the United States escalated by deepening its military commitment to the war. Punitive bombing raids and conventional military forces were used to move the conflict up the ladder of escalation (Gaddis 1982, 247-248). At each point great care was taken to ensure that the escalatory process was under control.[66] The purpose of the escalation was not so much to win the war through direct action as to exert controlled pressure on the enemy, in this case North Vietnam (Gaddis 1982, ch 8). The key to victory, according to military doctrine, was to compel the North to withdraw from the conflict. Once this was accomplished, a military and political victory would be forthcoming.

There is a clear and consistent symmetry between the grand

---

65 See Gelb and Betts 1979.

66 One of the great failings of flexible response in Vietnam was that while the United States was able to completely control the escalation of the war, this did not translate into any control over the conflict itself.

strategy and the military doctrine of the United States during the 1960s. The repudiation of the strategy of massive retaliation provided the Kennedy administration with the opportunity to totally rethink both strategy and doctrine, and the perception that the resources of the United States were virtually endless allowed it to act on its beliefs.

## 6.0 Conceptual Changes and the Selective Defense of Everything

Technology had a decisive impact on the formulation of flexible response in two ways. First, many of the specific policies involved in flexible response relied on military capabilities only available due to advanced technology. For instance, the ability to threaten escalation virtually anywhere in the world was largely the result of advanced transportation and communications technology. In Europe, the connection between the nuclear and non-nuclear levels of conflict rested on the existence of sizeable numbers of tactical nuclear weapons, also the result of technological innovation.

Second, technology dictated the strategic environment within which American strategists had to operate during the 1960s. Threats to the state changed drastically, at least for the great powers. New threats required a new type of strategy to provide security for the state. Furthermore, the very nature of the planning process was altered by technology. The whole notion of a separation between grand strategy and operational military issues became obsolete in the wake of mutually assured destruction.

Technology also led to a change in the nature of deterrence as well. In the past, deterrence had been based on the threat of military defeat. Once the Soviets obtained nuclear weapons and delivery systems capable of inflicting severe damage on the United States, deterrence threats ceased to revolve around the fear of defeat. Instead, they revolved around the fear of a nuclear war. This altered the nature of deterrence by making the threatened action unavoidable, while at the same time making the threat itself less credible. While it was less likely that a state would start a war which was likely to destroy all combatants, once started the destruction could not be avoided.

Flexible response sought to address the new conceptual problems associated with deterrence credibility in the age of mutually assured destruction. In order to strengthen deterrence, a state had to convince its opponents that it would indeed start a nuclear war, if it felt that such action was necessary. In order for the nuclear threat to be credible, America had to have a rational plan for the conduct of nuclear war. This was the case even if the original rationale for deterrence in the first place was that in the event of a war both sides would lose.

In the first model, the logic which shaped military doctrine was derived from political factors. This was in keeping with the Clausewitzian notion of strategy making. According to the third model, the logic which defined both grand strategy and military doctrine was derived from MAD. In this sense, it can be argued that technology, which created the conditions of MAD, also dominated the national security process.

This confused the distinction between military doctrine and

grand strategy. In many ways, issues of nuclear planning at the level of military doctrine are more important than non-nuclear issues at the level of grand strategy. However, nuclear strategy issues dominate both strategy and military doctrine, including military nuclear issues. For the Kennedy administration, the apparent answer to these new priorities was to create an integrated plan where all issues of grand strategy and military doctrine were coordinated. The logic of flexible response was, therefore, applied to strategy and doctrine over a wide range of different problems and threats. Overall consistency was needed to control the use of nuclear weapons and to rationalize all other policies to the realities of nuclear planning.

## 7.0 Conclusion

By the 1960s, technology had fundamentally altered the nature of both warfare and national security. It was no longer possible to guarantee, or even to attempt to guarantee, the absolute protection of the state from all threats. The threat of nuclear war was unresolvable; even the great powers had to condition their defense policies upon their mutual vulnerability. This fact changed the nature of security planning. In the abstract, threats to the state changed completely, as traditional ones such as direct invasion disappeared, while new ones such as nuclear annihilation arose.

A changed environment led to changed responses. The strategic agenda, from alliances on down to deterrence and defense, was altered by the new requirements of national

security. This was partly due to new threats, and partly due to other changed conditions within the strategic environment. In the case of alliances, part of the change was due to the effect of the nuclear revolution on the distribution of power within the international system. The nuclear superpowers were so much stronger than other states that alliances were not useful for power balancing. Even nuclear armed allies like France and Britain did not contribute substantially to the security of the United States.

## VI/ CONCLUSION

At the outset of this thesis, two primary questions were raised: 1) How have national security strategies changed in the twentieth century; and 2) How has technology been a factor in this change? Change in national security policy in the twentieth century has been profound. Almost no aspect of national defense planning has been left unaltered. Furthermore, the dominant force behind this change has been technological innovation.

Planning for the security of the state has changed in two fundamental ways. First, the nature of the threats to the state have been dramatically altered. Second, the methods by which states seek to address these threats has also changed. Change in these two categories has happened simultaneously, as both spring from innovation at the level of military doctrine. It is, therefore, incorrect to argue that either of these types of change has driven the other.

Changes in the nature of threats can be divided into two areas: the location of threats, and the expected results of threats. Change in the location of threats was due to the rise in the destructiveness of weapons. Traditionally, the greatest theat to the state has come from action by another, opposing, state. In essence, states were threatened with military defeat and its implications. The costs of the First World War, followed by the development of nuclear weapons in the Second World War, shifted the primary threat away from defeat in war to war itself. In 1914, German strategists were seeking to protect Germany from invasion by France and Russia. By 1960, American strategists

were trying to protect the United States from a nuclear war. While their rhetorical position revolved around protecting the U.S. from Communism, in fact, there was never any real danger of a Communist attack in the traditional sense. While the Communists might move against Third World countries, such as Vietnam, because of nuclear weapons there was never any danger of a traditional invasion of the United States. Political issues were subordinated to issues of military doctrine, namely the avoidance of a nuclear conflict. In Vietnam, where there was ideological conflict, the United States chose to lose, rather than escalate the conflict to include the use of nuclear weapons.

Threats were also different in terms of their underlying potential. In the past, a great power might well lose a war and still remain a great power. Prior to the First World War, Russia, France and Austria-Hungary all lost wars within a fifty year period without suffering a serious loss in their geostrategic position. The threats associated with warfare included the loss of life of one's soldiers, the possible destruction of a one's army, humiliating political concessions, and possibly some damage to the civilian population and wealth of the state, if the conflict was especially bitter. In the nuclear age, states were faced with the very real possibility of having most, if not all, of their major urban centers annihilated, and a substantial portion of their population killed within minutes. While the actual effects of a total nuclear war can only be supposed, it is no exaggeration to suggest that the state would cease to exist as a functional unit.

As threats changed, so too did responses to threats.

Technological change provided the state with a diverse range of possible responses to security threats. On one level, therefore, technology changed strategy by providing new options for dealing with security problems. At the same time, by altering the actual threats perceived by the state, technology forced new responses at the level of grand strategy and military doctrine.

Clearly, the pattern of alliance formation changed over time. In part, this was due to changes in the nature of threats perceived by the state. Deterrence is particularly interesting because not only did the actual composition of a deterrent strategy change, but its importance to the security of the state was revised as well. With the development of nuclear weapons and modern delivery systems, deterrence became the overriding priority of national security. The domination of the security agenda by deterrence once again led to a revision of the other components of security planning.

If it is incorrect to argue that one type of change drove the other, it is quite accurate to state that both types were driven by technology. The role of technology in creating and propelling change is clear. Technology fundamentally altered both the nature of threats to the state and the methods by which these threats could be met. Both the second and third models capture one aspect of the influence of technology on national security planning. In order to understand the process as a whole, however, it is necessary to consider both of the models.

This thesis has sought to examine the change in national security planning in the twentieth century and the role of technology in that change. It has found that planning for the

protection of the state has changed dramatically since the turn of the century. Key concepts, such as deterrence and alliances, have been altered considerably, while operational methods have also been constantly revised. Technology revolutionized the entire notion of defending the state, first by removing the possibility of a physical invasions, second by replacing invasion with the threat of a nuclear war for which there is no defense. Therefore, the ability to defend the state, at least among the nuclear superpowers, has become obsolete. In its place, strategists have substituted a security policy dependent almost completely on deterrence and the achievement of security objectives without the resort to war.

# BIBLIOGRAPHY

Adamthwaite, Anthony. France and the Coming of the Second World War 1936-1939. London: Frank Cass, 1977.

Adamthwaite, Anthony. The Lost Peace: International Relations in Europe, 1918-1939. New York: St. Martin's Press, 1981.

Albrecht-Carrie, Rene. France, Europe and the Two World Wars. new York: Harper & Brothers, 1961.

Alford, Jonathan ed. Sea Power and Influence. Hampshire: Gower, 1980.

Ambrose, Stephen E. Rise to Globalism: American Foreign Policy Since 1938. New York: Penguin, 1985.

Aron, Raymond. "The Evolution of Modern Strategic Thought," in Institute for Strategic Studies. Problems of Modern Strategy. London: Chatto & Windus, 1970.

Aron, Raymond. On War. New York: W.W. Norton and Co, 1968.

Aron, Raymond. Peace and War: A Theory of International Relations. New York: Doubleday, 1966.

Aron, Raymond. The Century of Total War. London: Derek Verschoyle, 1954.

Art, Robert J. "A Defensible Defense," in International Security. 15:4 (Spring 1991), pp. 5-53.

Baldwin, Hanson W. World War One. New York: Harper & Row, 1962.

Ball, Desmond and Jeffrey Richelson eds. Strategic Nuclear Targeting. Ithaca NY: Cornell University Press, 1986.

Ball, Desmond. "The Development of the SIOP, 1960-1983," in Desmond Ball and Jeffrey Richelson eds. Strategic Nuclear Targeting. Ithaca NY: Cornell University Press, 1986.

Ball, Desmond. Strategy and Defense. Sydney: George Allen & Unwin, 1982.

Baylis, John, Ken Booth, John Garnett and Phil Williams. Contemporary Strategy. New York: Holmes & Meier inc, 1975.

Blechman, Barry and Stephen S. Kaplan, "U.S. Military Forces as a Political Instrument since World War II," Political Science Quarterly 94:2 (1979): 193-209.

Blechman, Barry M and Stephen S Kaplan. Force Without War: U.S. Armed Forces as a Political Instrument. Washington: Brookings, 1978.

Blechman, Barry M. "Efforts to Reduce the Risk of Accidental or Inadvertent War," in Alexander L. George, Philip J. Farley and

Alexander Dallin eds. U.S. Security Cooperation. Oxford: Oxford University Press, 1988.

Bloch, Jean. The Future of War in its Technical, Economic and Political Relations. New York: Garland, 1972.

Bond, Brian. France and Belgium 1939-1940. London: Davis-Poynter, 1975.

Bond, Brian. War and Society in Europe 1870-1970. Leicester UK: Leicester University Press, 1983.

Booth, Kenneth. "Alliances," in Baylis et al. Contemporary Strategy. New York: Holmes & Meier Inc, 1975.

Brodie, Bernard. "Technological Change, Strategic Doctrine and Political Outcomes", in Klaus Knorr ed. Historical Dimensions of National Security Problems. Lawrence, Kansas: University Press of Kansas, 1976.

Brodie, Bernard. "Technology, Politics and Strategy," in Institute for Strategic Studies. Problems of Modern Strategy. London: Chatto & Windus, 1970.

Brodie, Bernard. Strategy in the Missile Age. Princeton: Princeton University Press, 1959.

Brodie, Bernard. War and Politics. New York: Macmillian, 1973.

Brodie, Bernard and Fawn Brodie. From Crossbow to H-Bomb. Bloomington, Indiana: Indiana University Press, 1973.

Brown, Harold. "Technology, Military Equipment and National Security," in Daniel J. Kaufman, Jeffrey S. McKitrick and Thomas J. Leney eds. U.S. National Security: A Framework For Analysis. Lexington MA: D.C. Heath & Co, 1985.

Brown, Robin. "Limited War," in Colin McInnes and G.D. Sheffield eds. Warfare in the Twentieth Century. London: Unwin Hyman, 1988.

Brown, Seyom. The Faces of Power. New York: Columbia University Press, 1983.

Bull, Hedley. The Anarchical Society. New York: Columbia University Press, 1979.

Buzan, Barry. People, States and Fear. Boulder, Colorado: Lynne Rienner, 1991.

Carver, Michael. The Apostles of Mobility. London: Weidenfeld and Nicolson, 1979.

Cimbala, Stephen J. Extended Deterrence: The United States, NATO and Europe. Lexinton MA: D.C. Heath & Co, 1987.

Claude, Inis L., jr. Power and International Relations. New York: Random House, 1962.

Clausewitz, Carl. On War. Princeton NJ: Princeton University Press, 1976.

Cordesman, Anthony H. "American Strategic Forces and Extended Deterrence," in Daniel J Kaufman, Jeffrey S. McKitrick and Thomas J. Leney eds. U.S. National Security: A Framework For Analysis. Lexington MA: D.C. Heath & Co, 1985.

Cox, R.W. and K. Jacobsen eds. The Anatomy of Influence. New Haven: Yale University Press, 1973.

Craig, Gordon A. "The Political Leader as Strategist," in Peter Paret ed. Makers of Modern Strategy. Princeton: Princeton University Press, 1986

Craig, Gordon A. War, Politics, and Diplomacy. New York: Frederick A. Praeger, 1966.

Doughty, Robert A. "The French Armed Forces, 1918-40," in Allan R. Millet and Williamson Murray eds. Military Effectiveness Vols 1-3. Boston: Allen & Unwin, 1988.

Dunn, Keith A. and William O Staudenmaier. Military Strategy in Transition. Boulder: Westview Press, 1984.

Dupuy, Trevor N. The Evolution of Weapons and Warfare. Indianapolis: Bobbs-Merrill Co, 1980.

Dupuy, Trevor N. Understanding War. New York: Paragon House, 1987.

Ferris, W.H. The Power Capabilities of Nation States: International Conflict and War. Lexington: D.C. Heath and Co, 1973.

Fischer, Fritz. War of Illusions. New York: W.W. Norton, 1975.

Foerster, Shuyler and Edward N. Wright eds. American Defense Policy. Baltimore: Johns Hopkins University Press, 1990.

Freedman, Lawrence. The Evolution of Nuclear Strategy. New York: St. Martin's Press, 1981.

Gaddis, John L. "The Evolution of a Reconaissance Satellite Regime," in Alexander L. George, Philip J. Farley and Alexander Dallin eds. U.S. Security Cooperation. Oxford: Oxford University Press, 1988.

Gaddis, John L. Strategies of Containment. Oxford: Oxford University Press, 1982.

Gaddis, John L. "The Long Peace: Elements of Stability in the Postwar International System," in International Security. 10:4 (Spring 1986), pp. 99-142.

Garnett, John ed. Theories of Peace and Security. London:

Macmillian, 1970.

Garnett, John. "Limited War," in Baylis et al. Contemporary Stategy. New York: Holmes & Meier Inc, 1975.

George, Alexander L, and Richard Smoke. Deterrence in American Foreign Policy: Theory and Practice. New York: Columbia University Press, 1974.

George, Alexander L, Philip J. Farley and Alexander Dallin eds. U.S. Security Cooperation. Oxford: Oxford University Press, 1988.

George, Alexander L. "U.S.-Soviet Efforts to Cooperate in Crisis Management and Crisis Avoidance," in Alexander L. George, Philip J. Farley and Alexander Dallin eds. U.S. Security Cooperation. Oxford: Oxford University Press, 1988.

Geyer, Michael. "German Strategy in the Age of Machine Warfare," in Peter Paret ed. The Makers of Modern Strategy. Princeton: Princeton University Press, 1986

Gilbert, Martin ed. A Century of Conflict. London: Hamish Hamilton, 1966.

Goldmann, Kjell, and Sjostedt, Gunnar eds. Power, Capabilites, Interdependence. London: Sage, 1979.

Graebner, Norman A. Cold War Diplomacy: American Foreign Policy 1945-1975. New York: D. Van Norstrand Co, 1977.

Gunsburg, Jeffrey A. Divided and Conquered: The French High Command and the Defeat of the West, 1940. Westport Conn: Greenwood Press, 1979.

Haffa, Robert P. The Half War: Planning U.S. Rapid Deployment Forces to Meet A Limited Contingency, 1960-1983. Boulder: Westview Press, 1984.

Haley, P. Edward, David M. Keithly and Jack Merritt eds. Nuclear Strategy, Arms Control and the Future. Boulder: Westview Press, 1985.

Hardach, Gerd. The First World War. Berkeley: University of California Press, 1977.

Hattendorf, John B and Robert S Jordan eds. Maritime Strategy and the Balance of Power. New York: St. Martin's Press, 1989.

Heilbrunn, Otto. Conventional Warfare in the Nuclear Age. New York: Frederick A Praeger, 1965.

Herring, George C. America's Longest War: The United States and Vietnam 1950-1975. New York: Alfred A. Knopf 1986.

Herwig, Holger H. "The Dynamics of Necessity: German Military Policy during the First World War," in Allen R Millett and Williamson Murray eds. Military Effectiveness Vol. 1. Boston:

Allen & Unwin, 1988.

Herz, John. International Politics in the Atomic Age. New York: Columbia University Press, 1959.

Herz, John. The Nation State and the Crisis of World Politics. New York: The David McKay Co, 1976.

Holsti, Kalevi J. Peace and War: Armed Conflict and International Order 1648-1989. Cambridge: Cambridge University Press, 1991.

Hough, Richard. Man O' War. London: J.M. Dent & Sons, 1979.

Howard, Michael. "Men Against Fire: Expectations of War in 1914," in International Security 9:1 (Summer 1984): 41-57.

Howard, Michael. "Military Power and International Order," International Affairs 40:3 (July 1964): 397-408.

Howard, Michael. "The Classical Strategists," in Institute for Strategic Studies. Problems of Modern Strategy. London: Chatto & Windus, 1970.

Howard, Michael. Clausewitz. Oxford: Oxford University Press, 1983.

Institute for Strategic Studies. Problems of Modern Strategy. London: Chatto & Windus, 1970.

Jackson, Robert. The Fall of France. London: Arthur Barker Ltd, 1975.

Jervis, Robert. The Illogic of American Nuclear Strategy. Ithaca: Cornell University Press, 1984.

Jervis, Robert. The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon. Ithaca: Cornell University Press, 1989.

Jervis, Robert. "The Political Effects of Nuclear Weapons," in International Security. 13:2 (Fall 1988), 80-90.

Kahan, Jerome H. Security in the Nuclear Age: Developing U.S. Strategic Arms Policy. Washington: The Brookings Institution, 1975.

Kahn, Herman. On Escalation. New York: Frederick A. Praeger, 1965.

Kaplan, Fred. The Wizards of Armageddon. New York: Simon and Schuster, 1983.

Karnow, Stanley. Vietnam: A History. New York: Penguin, 1983.

Kaufman, Daniel J, Jeffrey S. McKitrick and Thomas J. Leney eds. U.S. National Security: A Framework For Analysis. Lexington MA: D.C. Heath & Co, 1985.

Kaufmann, William W. Planning Conventional Forces 1950-80. Washington: Brookings, 1982.

Keegan, John. The Face of Battle. London: Penguin, 1976.

Keegan, John. The Price of Admiralty. London: Penguin, 1988.

Keegan, John. The Second World War. New York: Viking Penguin, 1989.

Kemp, Anthony. The Maginot Line: Myth and Reality. London: Frederick Warne, 1981.

Kennedy, Paul ed. War Plans of the Great Powers, 1880- 1914. London: George, Allen & Unwin, 1979.

Kennedy, Paul M. "The First World War and the International Power System," in International Security 9:1 (Summer 1984): 7-40.

Kissenger, Henry A. Nuclear Weapons and Foreign Policy. New York: Council on Foreign Relations, 1975.

Knorr, Klaus ed. Historical Dimensions of National Security Problems. Lawrence, Kansas: University Press of Kansas, 1976.

Knorr, Klaus. Military Power and Potential. Lexington: D.C. Heath, 1970.

Knorr, Klaus. On the Uses of Military Power in the Nuclear Age. Princeton: Princeton University Press, 1966.

Knorr, Klaus. The War Potential of Nations. Princeton: Princeton University Press, 1956.

Koch, H.W. ed. The Origins of the First World War. London: Macmillian, 1972.

Komjathy, Anthony T. The Crisis of France's East Central European Diplomacy 1933-1938. Boulder: East European Quarterly, 1976.

Lebow, Richard N. "Windows of Opportunity: Do States Jump Through Them?" in International Security 9:1 (Summer 1984): 147-186.

Lee, Dwight E. Ten Years: The World on the Way to War 1930-1940. Boston: Houghton Mifflin Co, 1942.

Liddell Hart, Basil H. Deterrent or Defense. London: Stevens and Sons, 1960.

Luard, Evan. Conflict and Peace in the Modern International System. Boston: Little Brown and Co., 1968.

Luard, Evan. War in International Society. New Haven: Yale University Press, 1986.

Luttwak, Edward N. Strategy and History Vol I & II. New

Brunswick: Transaction Books, 1985.

Luttwak, Edward N. Strategy: The Logic of War and Peace. Cambridge, Mass: Harvard University Press, 1987.

Mandelbaum, Michael. The Nuclear Question. London: Cambridge University Press, 1979.

Mandelbaum, Michael. The Nuclear Revolution: International Politics Before and After Hiroshima. Cambridge: Cambridge University Press, 1981.

Martel, William C. and Paul L. Savage. Strategic Nuclear War. New York: Greenwood Press, 1986.

McInnes, Colin and G.D. Sheffield eds. Warfare in the Twentieth Century: Theory and Practice. London: Unwin Hyman, 1988.

McInnis, Colin. "Nuclear Strategy", in McInnes, Colin and G.D. Sheffield eds. Warfare in the Twentieth Century: Theory and Practice. London: Unwin Hyman, 1988.

McNamara, Robert S. "Defense Arrangements of the North Atlantic Community", Speech before commencement exercises, Ann Arbour Mich, 16 June, 1962. in Shuyler Foerster and Edward N. Wright eds. American Defense Policy. Baltimore: Johns Hopkins University Press, 1990.

McNamara, Robert S. The Essence of Security. New York: Harper & Row, 1968.

Mearsheimer, John J. Conventional Deterrence. Ithaca: Cornell University Press, 1983.

Mearsheimer, John J. Liddell Hart and the Weight of History. Ithaca: Cornell University Press, 1988.

Mendelsohn, Eric, Merrit Roe Smith and Peter Weingart eds. Science, Technology and the Military Vol I & II. Boston: Kluwer Academic Publishers, 1988.

Messenger, Charles. The Blitzkrieg Story. New York: Charles Scribner's Sons, 1976.

Miller, Steven E and Stephen Van Evera eds. Naval Strategy and National Security. Princeton: Princeton University Press, 1988.

Miller, Steven E and Sean M. Lynn-Jones eds. Conventional Defense Forces and American Defense Policy. Cambridge: The MIT Press, 1989.

Miller, Steven E. ed. Military Strategy and the Origins of the First World War. Princeton: Princeton University Press, 1985.

Miller, Steven E. ed. Strategy and Nuclear Deterrence. Princeton: Princeton University Press, 1984.

Millet, Allan R. and Williamson Murray eds. Military Effectiveness Vols 1-3. Boston: Allen & Unwin, 1988.

Morgan, Patrick. Deterrence. Beverly Hills: Sage, 1977.

Mueller, John. "The Essential Irrelevance of Nuclear Weapons," in International Security. 13:2 (Fall 1988), pp. 55-79.

Murdock, Clark A. Defense Policy Formulation. Albany NY: State University of New York Press, 1974.

Nere, J. The Foreign Policy of France from 1914 to 1945. London: Routledge & Kegan Paul, 1975.

Orgill, Douglas. The Tank: Studies in the Development and Use of a Weapon. London: Heinemann,1970.

Osgood, Rober E. Limited War. Chicago: University of Chicago Press, 1957.

Osgood, Robert E. Alliances and American Foreign Policy. Baltimore: Johns Hopkins Press, 1968.

Osgood, Robert E. Limited War Revisited. Boulder: Westview Press, 1979.

Palmer, Gregory. The McNamara Strategy and the Vietnam War. London: Greenwood Press, 1978.

Paret, Peter ed. Makers of Modern Strategy. Princeton: Princeton University Press, 1986.

Paret, Peter. "Clausewitz," in Peter Paret ed. The Makers of Modern Strategy. Princeton: Princeton University Press, 1986

Pearton, Maurice. The Knowledgeable State. London: Burnett Books, 1982.

Pfaltzgraff, Robert L ed. National Security Policy. Hamden: Archon, 1984.

Pimlott, John. "The Theory of Strategic Bombing", in McInnes, Colin and G.D. Sheffield eds. Warfare in the Twentieth Century: Theory and Practice. London: Unwin Hyman, 1988.

Posen, Barry R. The Sources of Military Doctrine. Ithaca: Cornell University Press, 1984.

Quester, George H. Offense and Defense in the International System. New York: John Wiley and Sons, 1977.

Quester, George. Deterrence Before Hiroshima. New York: John Wiley & Sons, 1966.

Report to the Secretary General of the United Nations. Nuclear Weapons. London: Francais Pinter, 1981.

Ritter, Gerhard. The Schlieffen Plan. London: Oswald Wolff, 1958.

Roherty, James M. Decisions of Robert S McMamara: A Study of the Role of the Secretary of Defense. Coral Gables, Florida: University of Miami Press, 1970.

Rosecrance, Richard. Action and Reaction in World Politics. Boston: Little, Brown and Co., 1963.

Rosenberg, David Allen. "U.S. Nuclear War Planning, 1945-1960," in Desmond Ball and Jeffrey Richelson eds. Strategic Nuclear Targeting. Ithaca NY: Cornell University Press, 1986.

Rothenberg, Gunther E. "Moltke, Schlieffen and the Doctrine of Strategic Envelopment," in Peter Paret ed. The Makers of Modern Strategy. Princeton: Princeton University Press, 1986

Rumble, Grenville. The Politics of Nuclear Defense. Cambridge: Polity Press, 1985.

Sagan, Scott. Moving Targets: Nuclear Strategy and National Security. Princeton: Princeton University Press, 1989.

Schelling, Thomas C. Arms and Influence. New Haven: Yale University Press, 1966.

Schelling, Thomas C. Strategy of Conflict. Cambridge: Harvard University Press, 1963.

Sheffield, G.D. "Blitzkrieg and Attrition: Land Operations in Europe 1914-45," in Colin McInnes and G.D. Sheffield eds. Warfare in the Twentieth Century: Theory and Practice. London: Unwin Hyman, 1988.

Sloan, G.R. Geopolitics in United States Strategic Policy, 1890-1987. Brighton UK: Wheatsheaf Books, 1988.

Snyder, Glen H. Deterrence and Defense. Westport: Greenwood Press, 1961.

Snyder, Jack. The Ideology of the Offensive. Ithaca: Cornell University Press, 1984.

Stoll, Richard J. and Michael D. Ward eds. Power in World Politics. Boulder: Lynne Rienner, 1989.

Taylor, A.J.P. The Struggle for Mastery in Europe 1848- 1918. Oxford: Clarendon Press, 1954.

Trout, B Thomas and James E. Hart eds. National Security Affairs. New Brunswick: Transaction Books, 1982.

Turner, L F C. "The Significance of the Schlieffen Plan," in Paul M Kennedy ed. The War Plans of the Great Powers, 1880-1914. London: George, Allen & Unwin, 1979.

Van Creveld, Martin. Command in War. Cambridge Mass: Harvard

University Press, 1985.

Van Creveld, Martin. Supplying War. Cambridge: Cambridge University Press, 1977.

Van Evera, Stephen. "The Cult of the Offensive and the Origins of the First World War," in International Security 9:1 (Summer 1984): 58-107.

Watson, Adam. Diplomacy. New York: McGraw-Hill, 1983.

Watt, David. "America's Alliances: Europe," in Daniel J. Kaufman, Jeffrey S. McKitrick and Thomas J. Leney eds. U.S. National Security: A Framework For Analysis. Lexington: D.C. Heath & Co, 1985.

Watt, Donald Cameron. Too Serious a Business. London: Temple Smith, 1975.

Weller, Jac. Weapons and Tactics. New York: St. Martins, 1966.

Westwood, J.N. Fighting Ships of World War Two. London: Sidgewick and Jackson, 1975.

Williamson, Samuel R. The Politics of Grand Strategy. Cambridge: Harvard University Press, 1969.

Wilson, Trevor. The Myriad Faces of War. Cambridge: Polity Press, 1986.

Wolfers, Arnold. Britain and France between Two Wars. New York: Harcourt, Brace and Co, 1940.

Young, Oran. The Politics of Force. Princeton: Princeton University Press, 1968.

Young, Robert J. In Command of France: French Foreign Policy and Military Planning, 1933-1940. Cambridge Mass: Harvard University Press, 1978.

## BIOGRAPHICAL INFORMATION

NAME: Tim Carter

MAILING ADDRESS:

RR #2, Dove Creek Rd
Courtenay BC
V9N 7J3

PLACE AND DATE OF BIRTH:

Toronto, Ont. June 29, 1955

EDUCATION (Colleges and Universities attended, dates, and degrees):

B.A. University of British Columbia 1980

POSITIONS HELD:

PUBLICATIONS (if necessary, use a second sheet):

AWARDS:

**Complete one biographical form for each copy of a thesis presented to the Special Collections Division, University Library.**