

**UNCLASSIFIED**

**AD 4 2 5 7 8 4**

**DEFENSE DOCUMENTATION CENTER**

**FOR**

**SCIENTIFIC AND TECHNICAL INFORMATION**

**CAMERON STATION, ALEXANDRIA, VIRGINIA**



**UNCLASSIFIED**

NOTICE: When government or other drawings, specifications or other data are used for any purpose other than in connection with a definitely related government procurement operation, the U. S. Government thereby incurs no responsibility, nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use or sell any patented invention that may in any way be related thereto.

**Best  
Available  
Copy**

CATALOGED BY DDC

AS AD NO. \_\_\_\_\_

425784

A BRIEF DISCUSSION OF THE VALUE OF DEFENSE

Roger Levien

November 1963

P-2831

This paper summarizes a talk presented before the National Security Planning Working Group at the 12th Military Operations Research Symposium, held at the Air Force Academy, Colorado Springs, Colorado, October 22-24, 1963. Any views expressed in it are those of the author and should not be interpreted as reflecting the views of The RAND Corporation or the official opinion or policy of any of its governmental or private research sponsors. Papers are reproduced by The RAND Corporation as a courtesy to members of its staff.

## A BRIEF DISCUSSION OF THE VALUE OF DEFENSE

Diametrically opposite conclusions about the need for defense may follow from different understandings of the value of defense. They may do so even when there is full agreement about the possible courses of action, their costs, and their likely effectiveness. Consequently, if appropriate decisions are to be made concerning the extent and nature of the continental defense forces, it is necessary--though not sufficient--that the defense planner possess a complete picture of the many aspects of defense value. The object of this study is to assist the defense planner by providing a thorough description of those many aspects. In order to do so, it <sup>ing</sup> establishes a framework for the many aspects of the value of defense and then employs that framework to gain an overall appreciation of that value. The framework is three-dimensional.

The classes of conflict in which defense may have value are arrayed along the first dimension. They range from limited conflicts over the control of some region to all-out conflicts in which national survival is at stake.

The possible forms that the beneficial effects of defense may take are arranged along the second dimension. They are called, respectively, the military, economic, political, and informational effects of defense.

The phases of conflict during which defense may have value are enumerated along the third dimension. Conflict is defined to include disputes that have not yet entered the combat stage, so four phases of conflict are recognized: peacetime, initiation, wartime, and termination.

The term "defense" is construed very broadly in this study. It includes all active and passive measures of defense and protection and their associated warning, command, control, and communications.

There is no attempt made to balance the value of defense against its cost and its competitors. All that is done is to draw a detailed picture of the potential benefits of defense. An examination of that picture is not yet grounds for the procurement or improvement of defense; it is only a preliminary to the formation of defense policy.

- 1 -

## CLASSES OF CONFLICT

There are two broad classes of conflict upon which the continental defense forces may exert influence: conflicts of control and conflicts of survival.

The first class consists of conflicts in which control of some geographic region, such as a land mass, ocean trade route, airspace, or space itself, is in dispute. While important interests of the disputing parties are frequently in jeopardy in a single conflict of control, their survival as nations is not usually threatened.

The second class consists of conflicts in which the total disagreement between the nations transcends the sum of the individual disputes and the very survival of the disputing nations is at risk. A conflict of survival arises when at least one of the disputants has the ability and the incentive to seek to settle all the more restricted disputes between them by eliminating or threatening to eliminate the other disputant.

### Conflicts of Control

The resolution of a single conflict of control depends essentially on the relative capabilities of the opposing military forces in direct combat against each other. Control of its own territory and supporting regions is a requirement second only to physical existence for a nation that claims to be sovereign. Even if it could be proven that defense has no value in a conflict of survival, its value in conflicts of control would probably establish a requirement for air and space defense forces. Regardless of the trends in the technology of strategic offensive forces, sovereign nations may very well maintain into the indefinite future sufficient interceptor forces, radar surveillance, and command elements to control access to their national airspace by all likely intruders. Similarly, the military's role in exercising control of a region might define the forces it must acquire for defense against space-borne threats. Just as the possession of strong air defense forces is often sufficient to discourage any hostile intrusions into a nation's airspace, so the possession of strong space forces may discourage an opponent from trying to use space for aggressive ends.

### Conflicts of Survival

The resolution of a conflict of survival depends essentially on the relative capacities of the opposing military forces to inflict destruction on each other's homelands. While the conflicts are almost always conscious, though not always in the best interests of either of the parties, their passage into war may be subject to rational consideration--if war occurs, it is premeditated--or the consequence of nonrational factors--war occurs inadvertently through accident, error, or mischief.

There are two fundamental facts about the role of defense in premeditated conflicts of survival: The first fact is that no defender can by physical means gain lasting immunity from the threat of destruction. The state of present and foreseeable technology is such that for every means of defense against attack by a weapon of mass destruction the attacker may, given time, develop a countermeasure, an alternative attack weapon, or the capability of overwhelming the defenses.

The second fact is that no attacker has unlimited resources or unrestrained objectives. Although the possibility exists of overcoming any active or passive defenses in time, it places great demands on the attacker's finite economic resources and on his delicate balancing of political objectives. Either the resources are insufficient and defense achieves its direct effects or there are indirect effects: By drawing more resources into the attacker's offense mission, defense may prevent him from devoting them to his own defense, to his other military forces, to economic expansion, to space and scientific development, to foreign aid or to some of the other dimensions of national power.

Modern technology also presents the danger of wars of survival that start through miscalculation, misinformation, misunderstanding, mistake, or mischief. There is a significant possibility that such wars will be faltering, uncoordinated, and limited in extent. Consequently, the demands placed on defense in such wars could be much less severe than those placed on it in wars against a determined and prepared attacker. Relatively cheap and uncomplicated defense systems



that would never be procured for use in a war started by premeditation could provide an important measure of protection of lives and weapons in one begun inadvertently. Moreover, by providing a measure of protection to vital centers defense could give the decision makers time to find out the size, nature, and direction of attack before responding; it would lower the probability that an accidental attack would trigger a conflagration.

#### TYPES OF EFFECTS

In the remainder of this discussion of the value of defense, the region of interest will be restricted to conflicts of survival in which the war or peace decision is made rationally.

As an aid to categorizing the effects of defense, it is useful to adopt a simplified view of conflicts between great powers. In that simple view, one nation is the attacker and the other nation is the defender. In reality, of course, most nations prepare to be both attacker and defender; they procure both offensive and defensive forces. The terms "attacker" and "defender" are meant only to identify opposite points of view: the defender is the possessor of the defenses whose value is being assessed, the attacker is the one whose objectives are being thwarted by defenses. Defense may have four types of effects. It may:

- decrease the destructive capacity of the attacker's offense forces
- increase the cost of the attacker's offense forces
- restrict the choice of favorable policies for the attacker and broaden the choice of favorable policies for the defender
- worsen the state of the attacker's knowledge and improve the state of the defender's knowledge.

Those four effects shall be called, respectively, the military, economic, political, and informational effects of defense.

Assume that the defender has made a significant improvement in the defenses and consider the possible responses that the attacker may make to that improvement.

### Military Effects

One possibility is that the attacker will limit his responses to those that leave the total expenditure on offensive forces unchanged. Defense then will reduce the destructive capacity of the attacker below what it could have been in the absence of defenses.

The reduction may occur because of the attrition of offensive weapons by active defenses, the absorption of weapon destructive capacity by passive defenses, or the allocation of destructive capacity that could have been used against primary targets to the degradation of the defenses.

The last effect, though sometimes overlooked, can be significant. The targets saved by defenses may not necessarily be those at which defenses are located; they may be those unattacked because the weapons that could have been assigned to them were used to saturate, suppress, or otherwise overcome defenses located elsewhere.

### Economic Effects

A second possibility is that the attacker will respond to an improvement in the defenses with an increased expenditure on his offensive forces. The defense will then raise the cost of achieving a certain destructive capacity above what it could have been in the absence of defenses.

The increased cost may occur because of the need to procure greater numbers of current weapons to compensate for the defenses or to develop new weapons less vulnerable to the defenses.

If the attacker wishes to spend the resources, his total destructive capacity can be kept at the level it had attained before the defense improvement. But the resources spent to improve the offense forces must be drawn from some other national program: defenses, non-strategic military forces, space, industry, consumer goods, or foreign aid. A well-designed defense may have its greatest influence on the attacker's power, therefore, not by reducing destructive capacity, but through the reduction in effort it causes in one of those other programs.

### Political Effects

A general measure of the quality of an offensive force is the ratio of the destructive capacity it possesses to its cost--its offense efficiency. Whether the attacker chooses to accept a reduction in destructive capacity or an increase in cost or some of both, the primitive effect of defense, which the attacker cannot overcome, is a reduction in offense efficiency. But the attacker's choice, while his, is not entirely free. If rationally made, it must be informed by questions of national policy and, as the choices become increasingly difficult, it must be reflected in turn in the determination of policy.

If a defender successfully reduces the efficiency of the attacker's offensive forces, then the cost to the attacker of pursuing policies that depend upon maintenance of a certain level of destructive capacity increases. As the cost increases, the desirability of the policy will decrease. If the cost increases sufficiently, it may become necessary to change the policy. Policy modification, therefore, is one possible political effect of defenses.

If a nation chooses not to respond to an improvement in its opponent's defenses or if not enough time has passed for its responses to have become effective, then its ability to threaten destruction has been reduced. To that degree its power in the bargaining that characterizes a continuing conflict of survival must also be reduced. Weakening of an opponent's power position is therefore another possible political effect of defenses.

### Informational Effects

Properly designed defenses may add to the power of their possessor not only by reducing the efficiency of a prospective attacker's offensive forces, but also by reducing the certainty with which the attacker knows his own capability and the defender's and increasing the certainty with which the defender knows them. Uncertainty can lead an attacker to divert resources to intelligence and reconnaissance, cause him to worry about the worst cases as well as the most likely one, press him to hedge against undesired contingencies, weaken his hand in

negotiations and raise his vulnerability to bluffs, and make his process of planning more difficult and subject to error.

Defense contributes to the uncertainty of the attacker in two ways. First, the capabilities of the defense will usually be imprecisely known to the attacker. Second, defense may be employed to control the flow of information to the attacker about all aspects of the defender's strength. The object is to control rather than to prevent, for while it is desirable to retain the capability to prevent reconnaissance, there are wartime situations in which it might actually be desirable to permit selective acquisition of data by the attacker.

Defense contributes to the certainty of the defender by providing warning of attack, status information during the war, and verification of war termination agreements.

#### PHASES OF CONFLICT

In the same way that contemporary defense analysis has concentrated on premeditated wars of survival and on the military effects of defense, to the neglect of other important circumstances and effects, it has concentrated on the wartime benefits of defense, to the neglect of the potential benefits in other phases of conflict. But defense may have great value in peacetime, during the initial period of a war, and at the termination of a war. And a reasoned evaluation of defense must weigh those prospective benefits along with those that may occur during actual combat. Hence, it is important to reorder the effects of defense, which were grouped in the previous section without respect to the time at which they occurred, along a time coordinate. Four phases of a conflict of survival may usefully be distinguished: peacetime, initiation, wartime, and termination.

#### Wartime Phase

The wartime phase is discussed first because it is the focus of all defense efforts, the trial for which all planning is done. Many of the effects that defense has in the peacetime, initiation, and

termination phases are the consequences of an estimate of the effects of defense in the wartime phase.

During wartime, defenses reduce the attacker's destructive capacity in two distinct ways. First, there are the direct and evident effects of defense, which appear as the attrition of attacking vehicles by active defenses and the absorption of destructive capacity by passive defenses. Second, there are the indirect and subtle effects of defense, which appear as an allocation of destructive capacity that could have been used against the primary targets of the offense to the effort to degrade the defenses.

The presence of defenses may encourage restraint in the manner in which a war of survival is fought; it may promote limited, purely counterforce attacks in which by-product civil destruction is limited.

Defenses enable the defender to control the attacker's knowledge of the success of his attack and of the status of the defender's forces; they provide information to the defender regarding both those matters.

#### Peacetime Phase

The peacetime benefits of defense are difficult to identify since the necessary data is frequently unavailable, tacit, latent, or subject to double-counting. It is important to identify them, however, for if the threat of war drops and stays low, there is a tendency to discount the wartime effects of defense and to evaluate it solely on the basis of its peacetime benefits. It would be tragic if important benefits became evident only as a consequence of their loss through defense reductions.

Defense lowers the offense efficiency that the attacker may achieve during the peacetime arms competition, either by reducing the potential destructive capacity or by increasing the costs of his offense forces or by both. The existence of defense may foreclose attractive directions of development of offense technology.

Defense narrows the range of national strategies that the attacker may follow and reduces the power that he may bring to tacit

or explicit negotiations--either by reducing his destructive potential or by drawing more resources into the offense forces from other aspects of national power.

Defense controls the information available to the attacker and, by introducing additional uncertainties, complicates his planning process.

#### Initiation Phase

Whether the war is initiated by the attacker or the defender, defense may have important values.

Should the attacker initiate, defense may provide tactical warning, increase the attacker's uncertainty about the success of his attack, provide time for the defender to respond wisely, and force the attacker into incautious attacks. It also enlarges the class of responses available to the defender.

Should the defender initiate, defense may provide warning of the response and indication of its character. Moreover, by protecting elements of national value it may enable the stringent requirements on the first-strike effectiveness of the offense forces to be eased. Since the defender would probably be prepared and the attacker might not be, the effectiveness of the defenses should be better than in the case when the attacker initiates.

#### Termination Phase

The surviving defenses, by reducing the attacker's estimated residual destructive capacity and preserving the defender's, should influence the final agreement to the benefit of the defender.

The military effects of defense may be greater during the terminal phase than they were during the earlier phases: the defense will have had experience in combat against the offense; the residual offense force may not be as competent as the original forces; and important components of the defenses could have survived the earlier phases if they protected second-stage rather than first-stage targets.

The remaining defenses may enable the defender to control the information the attacker has about the defender's status, provide information to the defender about his own status, protect the command centers needed to conduct war termination negotiations, and provide the means for verification of the agreement reached.