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Pentomic Doctrine: A Model for Future War

A Monograph
by

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This monograph investigates Pentomic doctrine of the 1950's. The political and military factors that drove the Army to adopt a new vision of war, restructure and reorganize its major combat formations and to eventually abandon that change are very similar to forces driving today's Army. Although the primary focus of this monograph is the military aspects of the Pentomic doctrine, the doctrine was initially directed by political concerns, consequently, political factors are examined first. The monograph examines similarities between today's political environment and that of the Pentomic era. Today's Army is again turning to technology to provide answers to insufficient manpower to meet required defense force structure. As the Army adopts new technology, the vision of future warfare tends to change raising questions on how the Army plans to fight in the presence of such technology. By studying the past the Army may avoid mistakes in the future. The political and military factors that the 1950's Army had to consider provides a case study on what the Army planned to achieve and which operational problems drove modifications in force structure, technology and methods of execution.

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ABSTRACT

PENTOMIC DOCTRINE: A MODEL FOR FUTURE WAR by MAJ Jack F. Smith, USA, 48 pages.

This monograph investigates Pentomic doctrine of the 1950's. The political and military factors that drove the Army to adopt a new vision of war, restructure and reorganize its major combat formations and to eventually abandon that change are very similar to forces driving today's Army.

Although the primary focus of this monograph is the military aspects of the Pentomic doctrine, the doctrine was initially directed by political concerns, consequently, political factors are examined first. Similar political pressures led to direct competition between the uniformed services for limited resources in an age of shrinking defense budgets. Each respective service turned to nuclear weapons technology as a solution to meet battlefield requirements.

The monograph examines how political factors are effecting today's Army and how similarities exist between today's political environment and that of the Pentomic era. Today's Army is again turning to technology to provide answers to insufficient manpower to meet required defense force structure. As the Army adopts new technology, the vision of future warfare tends to change raising questions on how the Army plans to fight in the presence of such technology. The Army's answer to a nuclear battlefield produced Pentomic division doctrine with its many ancillary changes in how the Army conducts war. 1990's technology impacts today's Army and will lead to a myriad of proposed changes in how the Army conducts our future wars. By studying the past the Army may avoid mistakes in the future.

The force structure and composition of Pentomic units were vastly different from the forces that had just recently fought in the Korean Conflict. The Army underwent a paradigm shift in its view of warfighting. The political and military factors that the 1950's Army had to consider provides a case study on what the Army planned to achieve and which operational problems drove modifications in force structure, technology and methods of execution. This paper shows a linkage between the 1950's environment that led to wholesale change in the Army and today's environment. As the Army begins its search for answers to that environment we find Pentomic doctrine may contain the solutions.

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I. INTRODUCTION

Warfare is a complex enterprise that requires military leaders to understand the effects of weapons, operational design, strategic aims and political ramifications of military actions. Throughout history societies matured and technology transformed agricultural societies into industrial and post industrial societies. The art of making war experienced similar transformations. Technological changes inherently alter the conduct of war and forces military leaders to adopt new methods (tactics, techniques and procedures) to meet new battlefield realities. Armies that identify both the needs for change and correctly adapt themselves to changing circumstances and realities can meet the challenges of future warfare.

New technologies, decreasing budgets and changing international relations require the Army to reevaluate the role of warfare, how to prosecute warfare and how the military can achieve future national objectives. The collapse of the Soviet Union and the end of the Cold War removed the threat the Army faced for fifty years. Now there are no obvious prospective opponents who could field modern mechanized forces to prosecute a major land campaign against the United States. The Army is attempting to come to grips with a future that will produce new opponents whose forces fight in a manner distinctly different for the mass conscript armies of the past. What is not obvious is the direction of change. Recognizing this, General Gorden Sullivan, the Army Chief of Staff recently wrote:

> ... International and domestic realities have resulted in the paradox of declining military resources and increasing military missions, a paradox that is stressing our Armed Forces...It requires fundamental changes in the way the nation conducts its defense affairs.[1]

As the Army searches for solutions it may be useful to examine how the U.S. Army adapted to change before. New technology such as automatic weapons, railroads, airplanes, wireless communication and mechanization, all produced wholesale changes in tactics, operational art and strategy. Each change forced the Army to adopt new tactics to exploit the new technology. But "operations from the lowest level to the highest are on a continuum."[2] When a nation's armed forces adopt change at the tactical level inevitably other aspects of military operations must change, effecting the entire military institution to include the operational and strategic level.

Advancements in technology are not the only source of change in military institutions. Political decisions can direct military institutions to change or can redefine roles and missions that requires major modifications in a military establishment. Economic and budgetary reform pressures may either limit or expand a military's ability to modernize. Diplomatic pressures can also place significant burdens on the military to adopt significant changes.

A look at the history of the United States Army will find that during the 1950's the Army reacted to technological, political and economic forces and adopted the Pentomic Division concept. The Army responded to both internal and external pressures by identifying a need for wholesale change, studying how to implement those changes and then adopting a completely new way of conducting war. The resulting doctrine drove the Army to accept an entirely new view of the battlefield, of itself as an institution, and its role within the national defense establishment.

Today's Army faces very similar pressures to those of the 1950's. Changing internal and external political realities combined with changing economic conditions are leading the Army to re-evaluate how it must organize, train and equip itself for future wars. Perhaps a study of how the Army addressed these

issues in the 1950's can help today's military to sort through complex issues to avoid making similar mistakes. At the same time, Pentomic era doctrine may provide insights into tactical and operational issues that apply to future war as the Army struggles to define how to fight on the 21st century battlefield.

The pentomic division of the late 1950's was a military response to the conceptual introduction of nuclear weapons to the tactical battlefield and to increased political pressure to redefine the Army's role on a modern battlefield. Under the New Look military President Eisenhower directed the Army to address changes in new technology as well as meet the demands of an ever decreasing military budget. President Eisenhower made reliance on nuclear weapons and massive retaliation the dominant element of his national security policy. Given a new national security policy the Army could no longer ignore the changing realities that relegated the service to a minor role in the defense of the nation.[3]

The resulting doctrine envisioned an Army very similar to that being considered for the 21st Century. Pentomic units were to be small, balanced, hard hitting forces capable of independent operations over extremely wide and deep areas of operation. The force structure and composition of Pentomic units were vastly different from the forces that had recently fought the Korean Conflict in 1950.[4] The factors that the 1950's Army had to consider provide a case study on what the Army planned to achieve and what operational problems drove modifications in force structure, technology and methods of execution. The Army instituted major modifications in force structure and doctrine that contained major flaws. As today's doctrine goes through changes the Army needs to avoid similar deficiencies.

Many of the military and political concerns that shaped Pentomic era doctrine are similar to those Army leaders face today. Exploration of those

concerns and the Army's response may identify technical and tactical failures within the military and failures in both national and military policies.

This paper demonstrates that similarities exist between the 1950's and the 1990's. The Army of the 1990's is facing political, economic and technological pressures to change not only how it will fight future wars, but also how the Army trains and equip the force. This paper shows a correlation exists between the conditions that forced the adoption of Pentomic division doctrine and the conditions and vision of how the Army plans to fight in the next century.

General Gorden Sullivan believes that "land warfare in the 21st century will be shaped by the cumulative effects of many revolutionary changes that have yet to merge in a clear or predictable pattern."[5] The monograph will show that the conceptual solutions the Army is considering are very similar to the tactics and doctrine envisioned for the Pentomic division. Though the driving force for those tactics and doctrine were nuclear weapons, the combination of service rivalries, limited resources and political pressures produced conventional military forces similar to those envisioned for future war. The Army never fielded the required force structure, manpower and material to execute Pentomic doctrine. Today's Army may find itself in the same dilemma as it prepares to change its doctrine.

As today's Army searches for change, new technology may lead to a force structure that produce Pentomic type units using similar Pentomic doctrinal concepts in future wars. These units will consist of:

> Smaller regimental combat teams or integrated battle groups, of all arms; semi-independent and self-contained: capable of operating over extended distances on a fluid battlefield with little control from higher headquarters.[6]

This unit tactical concept drove the Army to adopt wholesale change in tactics, strategy, force structure and doctrine. A similar change will guide Army evolution into the 21st century.

II. THE FORCES OF CHANGE

A. A New World Order.

Following the collapse of the Axis powers at the conclusion of W.W.II a new world order emerged. The United States stood alone at the top in the West. Britain and France had difficulty recovering from a decimated economic infrastructure and manpower losses from two World Wars in under 30 years. In contrast, the United States homeland had come through both wars virtually unscathed. While the United States' casualties during W.W.II were tragic, the 400,000 deaths were insignificant when compared to the 55 million who lost their lives' world wide.[7]

The aftermath of such a devastating war led the United States to reconsider its military policy. Any changes would have to consider two issues since, "Military policy is based upon two elements, the structure of a nation's armed forces and the strategy of their use."[8] Force structure decisions following W.W.II saw the United States dismantle its massive war machine. The nation was weary of war and had a desire to experience the "peace dividend" after 15 years of the Great Depression and a World War. During the years 1945-1947 the military budget shrank from 82 billion to 13 billion dollars. At the same time Army strength fell from eight million to slightly more than 1.5 million soldiers.[9]

Post war strategy required the Army to concentrate on a large number of tasks not associated with war fighting. These tasks included occupation duty in Japan and Germany, demobilization of a vast war infrastructure and other peacetime requirements. The combination of a weary nation and an Army without any true war fighting mission resulted in a general decline of the Army. Two significant events reversed the Army's decline.

Following the war, quarrels between the West and the Soviet Union began as the latter consolidated power in Eastern Europe. The West viewed the establishment of pro-Communist governments in the Eastern block as a threat.[10] It fell upon the United States to counter that threat. When the Soviet Union exploded their first atomic weapon in 1949, the United State's perception of a real threat grew exponentially. Atomic weapons combined with Soviet conventional numerical superiority forced the United States to re-evaluate the role of the Army.

The Korean conflict was a second event that reaffirmed the need for a viable Army. Faced with a possible escalation into World War III, the United States entered the Korean Conflict with a limited aim. Instead of using the total national might, including nuclear weapons, to destroy an enemy to achieve overwhelming victory, the nation would use predominantly land forces with limited objectives to impose its will on enemy. In this war the nation would not fight for complete victory but for only the return of the status quo.[11]

A protracted conventional limited war produced challenges unsuited to the Army's existing condition. Army fighting skills atrophied during years of occupation duty. An Army faced with commitments worldwide neglected weapons modernization and realistic training. Thus the Army that entered the Korean Conflict with W.W.II equipment, W.W.II tactics were completely unprepared to meet the challenge of intense combat. The American public shockingly watched a great super power's Army suffer tactical setbacks during the initial stages of the Korean Conflict. This same public grew weary as the conflict transition into a prolonged stalemate.[12]

The debacle in Korea led Eisenhower's presidential campaign to make the issue a central theme. He promised to end the war on terms favorable to the United States and to return the country to a position as leader of the free world.[13]

This stated goal would lead to dramatic changes in the Department of Defense and the Army.

B. The New Look

The Korean war was "prolonged, disagreeable, inconclusive, and in consequence politically unpopular."[14] With this backdrop the Eisenhower administration took a long look at how the nation should define its military strategy for the future.

The military perception was that the United States struggled in Korea due to self imposed political constraints by political leaders in this country and the United Nations. "Although the Eisenhower administration accepted that nuclear superiority would not last forever, it was far less willing than its predecessor to forgo any immediate benefits that superiority might afford."[15] Eisenhower's Administration believed nuclear firepower was a fact of warfare especially if atomic weapons could prevent escalation of a war or limit both the war's duration and the number of casualties to United States military personnel. Such a belief led Eisenhower's administration to recommend sweeping change in defense policy.

Eisenhower's administration first changed existing strategic policy. Secretary of State John Foster Dulles announced United States' foreign policy in 1957. The nation would deter any future aggression by depending "primarily upon a great capacity to retaliate, instantly, by means and at places of our own choosing."[16] The political world referred to this policy as massive retaliation. The implication was that the Nation would resort to nuclear weapons if the nation felt that its vital interests were at stake.

Because nuclear weapons had become the center piece of United States strategic policy, battles in the defense establishment among the different services began in earnest over resources. The Air Force justified its need for more

resources by arguing it possessed a proven ability to deliver the bomb from the air. The Navy positioned itself as a nuclear service with its super carrier program. The Army was initially unable to defend either its budget or its role under the new strategic policy. The Army's solution was to urge the development of tactical nuclear weaponry and development of theater missiles.[17]

The battle for resources became the preoccupation of the Department of Defense. The Air Force's and Navy's abilities to project power in a moment's notice placed the Army's role in future conflicts in question. While the Army always felt that they would play a vital role in any conflict, members of Congress or members of the Executive Branch who approved programs and appropriations did not share this belief. The Army leadership felt alienated from the civilian leadership.[18]

The Army's increased expenditure on missile technology and tactical nuclear weapons crowded out investments in improved conventional capability. "The United States simply could not afford to maintain all kinds of forces designed to fight all kinds of wars at all times."[19] Yet, the lessons of Korea demonstrated that, "The prospect of no-notice intervention demanded units that were instantly available for deployment and prepared for combat."[20] The Army needed combat units that could fight anytime and anywhere on short notice. Western nations and NATO reached the same conclusion as they assessed emerging threats to regional and global security. They agreed to support rearmament to meet any possible future confrontations with the Soviet Union. With Germany rearming, post war Japan now stabilized and the Korean Conflict now a part of history, the Army was ready to address preparations for the next war.

C. The Army Struggles for an Answer

The Army's leadership identified problems rising from new Cold War realities reinforced by the debacle of the Korean Conflict. General Mathew B. Ridgeway and General Maxwell D. Taylor knew that institutional changes and conventional force modernization were the only way to meet the many challenges that the nation would face in the future. They also understood that military policy had two elements, force structure and strategy:

> While both Ridgeway and Taylor understood the potential future battlefield and the importance of conventional forces in maintaining political and military flexibility, they were forced to make concessions to the new look strategy.[21]

The New Look forced the Army to react to the powerful Air Force and Navy lobbies. The Eisenhower administration chose to emphasize strategic and tactical nuclear weapons as the easiest and cheapest means to meet the national defense needs. Any argument by the Army contrary to the political wisdom of the day was ineffectual. "The Army was unable to influence the external forces of change, therefore, was limited in its ability to effect internal change."[22] The Army had to adopt a nuclear theme or face being left out as a viable member of the national defense structure.

In response to Eisenhower's policy each branch of service developed concepts for the employment of nuclear weapons. A reliance on nuclear firepower led politicians and the public to believe conventional war was now obsolete.[23] Political and public support for large land forces waned dramatically as the nation struggled with a vision for a future nuclear holocaust. While the nation generally felt that it could no longer be isolationists it also felt the expenditure of American manpower to police the world was inappropriate. American citizens wanted to avoid future Koreas. If America had to intervene in another Korea "like" conflict,

that intervention should use technology rather than squander American manpower.[24]

Given the political realities and guidance from the Eisenhower administration the Army decided to join the drive for technology. Missile and nuclear technology made an immediate impact on the Army as an institution.

> Technology undermined old assumptions, rendered traditional practices obsolete, and seemed to require a radical overhaul in the way that the Army equipped and organized itself.[25]

If nuclear weapons were an integral part of the modern war then the Army must change the way it prepared to fight.

D. The Nuclear Battlefield.

A nuclear battlefield environment affects how a unit deploys, how it attacks and how it defends. Tactical nuclear weapons gave the commander an unprecedented level of firepower. Nuclear technology became the answer for all the ills of an Army. "The absence of a consistent operational concept inspired the Army's new ideas with technology (in the form of more nuclear weapons) as a fig leaf to cover change."[26] By producing and fielding nuclear weapons ranging from ICBMs to the smallest artillery shell it was apparent the United States was relying on "more bang for the buck."[27]

It was also apparent to Army thinkers that nuclear weapons changed the way a conventional army would fight on the battlefield. Simultaneously the Army felt that if another Korea "like" conflict arose that as the Army developed techniques to fight (a major conflict) successfully, then other less-demanding conflicts would be manageable.[28] The conclusion was a properly trained, equipped and ready Army capable of fighting a major conflict could be successful in any lesser mission.

If that were true, then to meet the requirements of a major conflict the Army had to define how they were to fight large unit formations in a major conflict. Army leaders assumed that nuclear weapons would be an integral part of military operations given the existing strategic policy. The presence and uses of such weapons imply a certain environment the Army must consider. It is the environment that led to Army adjustments in its war fighting doctrine and to adopt new techniques that would take into account the nuclear battlefield.

Nuclear weapons introduce four damaging effects to the battlefield. Blast and searing heat is the primary destructive effect for military equipment. Lethal effects to personnel come from blast, heat and also radiation. Finally nuclear detonations produce severe electromagnetic transients that can destroy electronic equipment in an instant. Atomic weapons detonations can occur in the air, on the ground surface or beneath the surface. Table 1 provides a general description of each type explosion and the resulting effects.[29]

Table 1. Nuclear Weapon Effects

Type of Burst	Heat	Blast	Radiation
Air	Great and widespread.	Great and widespread.	Considerable, prompt radiation. No significant residual radiation except for small areas under the blast.
Surface	Great but not widespread	Great, but radius of effects somewhat reduced.	Great prompt, but not widespread. Residual radiation generally confined to area of explosion.
Subsurface	Negligible	Great, but radius of effect greatly reduced.	Little or no instant radiation. Great amount of residual radiation (fallout).

Table 1 describes nuclear weapon effects that cover vast areas and place concentrated military forces in jeopardy of total annihilation. If properly

detonated, radiation effects could contaminate large portions of the battlefield making large unit movements very difficult. Weapon effects from even a small tactical weapon could render any military formation combat ineffective within miles of ground zero.

A description of nuclear effects usually relies on a reference to ground zero. Ground zero is a point on the ground surface that marks the location of the explosion. The point on the ground provides a benchmark to reference each respective nuclear effect even if the explosion occurs above or below the actual ground surface. This point marks the center of nuclear effects. Weapon's effects templated around ground zero then describe induced areas of devastation. Each respective effect produces different templates based on the type of burst and the nature of the target. These templates describe zones of damage. Closest to ground zero is the zone of certain damage. Next is the zone of probable damage and finally there is the zone of no damage.

Nuclear effects in each zone cause different types of damage on a military formation. A particular weapon yield and type of burst could destroy a battalion in a defensive position in seconds. Enemy weapons targeted against key transportation nodes would decimate an entire corp's support structure. If an attacking force attempted to mass overwhelming combat power at a decisive point it would present a lucrative target for enemy nuclear strikes.

The Army had to determine how a conventional military force could function in such an environment. Intuitively a nuclear environment demanded changes in tactics, techniques and procedures. These changes would directly lead to changes in force structure, command and control apparatus and changes in the composition of basic fighting elements. A Command and General Staff College instructor presented the problem this way:

> The Army's emphasis on new techniques and the promise of futuristic technology seemed to beg the questions: "How do we fight today's battle with today's equipment?"[30]

The answer came in the form of a new divisional organization and a new war fighting doctrine based on the Pentomic Division.

III PENTOMIC DIVISION DOCTRINE

A. The Pentomic Concept

A nuclear battlefield is a very lethal place particularly if armies attempt to fight in dense linear formation like World War II. Operational formations that led to mass formations for an attack or well prepared, fortified linear defenses to hold territory was no longer viable. Both formations would simply provide a lucrative nuclear target to the enemy. To avoid presenting a lucrative target it is necessary to disperse a military force over extremely large areas. Planners realized that dispersion would impose greater requirements on smaller units for security, supply, mobility and other such tactical matters. Tactical formations had to be smaller than existing combat regimental teams and an integrated battle group composed of all arms: infantry, armor, air defense and engineers. Each battle group had to operate semi-independent and self-contained with the capability of operating "over extended distances on a fluid battlefield with little control by higher headquarters."[31]

To field smaller, dispersed combat teams required a total restructuring of the Army's base formation, the division.

> In reorganizing, the Army moved from a triangular infantry structure with three regimental teams to a Pentomic concept composed of five battle groups, each a self-contained force capable of independent operations.[32]

Battle groups became the maneuver unit below. Each battle group was powerful enough to conduct effective independent operations. The division's role was to provide general tactical control, support and supplies to the five battle groups.[33]

By going from three to five subordinate units within the division the Army hoped that with a greater number of units at his disposal the commander would have more tactical options for the employment of subordinate units. The increased number of units would allow deployment in depth and also provide additional command and control lower headquarters to conduct the fight in all directions on a non-linear battlefield.[34]

With the basic army unit reorganized, the Army had to define how those units fight on the battlefield. To understand the transition from conventional Army fighting doctrine of W.W.II to Pentomic Division war fighting doctrine one needs to investigate nuclear tactics.

B. The Nuclear Battlefield.

The vision of the nuclear battlefield revolved around the timing, location and effects of nuclear weapons. Success for the attacker hinged on the effectiveness of nuclear strikes. The battle would begin with a nuclear saturation attack followed by massive tank and motorized infantry attacks on the flanks of the area of devastation. The tactical aim of the conventional force attack was simply to mop up all remaining enemy formations. Massive airborne and special forces' insertions into the rear supplement the main attack by forcing the opponent to conduct operations in several directions while also allowing the attacker to bring additional combat power against the opponent without having to mass additional forces.[35]

Military thinkers believed that long-range penetration was an integral part of nuclear warfare due to the proven capability of both aircraft and wireless

communication. A successful deep penetration would dislocate not only the enemy's forward troops but an entire military plan could become unhinged by threatening command and control facilities and disrupting lines of communications. By attacking deep into the rear, strong combat forces are able to go against soft targets the defender is unable to protect. If he should attempt to protect his entire military force, he would simply dissipate combat power throughout the width and breadth of the defense becoming weak everywhere.[36]

When on the defense, an army seeks to reduce the effect of nuclear attack by dispersing its forces, weapons and supplies. The defense would also employ immediate nuclear counter-strikes to isolate the battle area, destroy enemy nuclear weapons and to break up the ground and air attack. The defender rushes reserves into devastated areas to seal off any break through. The defense's aim is to break up the armored thrusts or channel and bottle them up so that the stacked up formations would be susceptible to nuclear strikes.[37]

To execute offensive or defensive operations on the nuclear battlefield an army must possess several critical capabilities. Tactical units must have the ability to react to a fluid battlefield. Massing and dispersing continuously requires increased capability in target acquisition, tracking and delivering fires. Mobile armored formations deploy initially in a widely dispersed array. In order to adequately react to the enemy's massing and launch a counter-attack, a defender would have to see and anticipate were the attacker would hit the defense.

On the nuclear battlefield both the attacker and the defender must possess cross country mobility. This capability goes beyond just the tanks and the infantry fighting vehicles. All fire support systems and supply vehicles would have to accompany the combat forces as it rapidly shifts across the battlefield. Destructive power of nuclear weapons would quickly cripple transportation networks. Such

destruction would require each element of the combined arms' team would need cross country mobility.

Air superiority on a nuclear battlefield is critical. Because nuclear weapons would cripple road and railroad networks, a military force would depend heavily on aircraft for both supply and attack missions. Local air superiority allowed the Army to execute aerial resupply, movement of combat forces by air, and deliver nuclear ordinance.

Given a nuclear battlefield the Army identified attributes that a military force must possess to function in that environment. Increased reliance on cross country mobility, dispersion, air superiority and changes in tactics at all levels of command demanded changes in basic doctrine. These changes led to Pentomic doctrine.

C. Pentomic Doctrine.

Pentomic doctrine addressed the fundamental characteristics of conventional forces on a nuclear battlefield with dispersion becoming a primary tenet of military operations. Command and General Staff College (CGSC) instruction during the 1940's through the 1960's provide a good example of how dispersion effected the military. A World War II division could occupy seven kilometers of front. By the 1950's the division in a CGSC exercise would occupy fifteen kilometer frontages with a depth of fifteen kilometers in sector. By 1960 a similar division operated within a 900 square kilometer sector. One can identify three primary reasons for this enormous growth in a division's sector. The first cause was an increase, albeit small, in a division's size from a 14,000 man Pentomic division to a 16,000-20,000 man Reorganization Objectives Army Division (ROAD).[38] Secondly, some new and improved weapons and communications equipment allowed combat forces to cover larger areas. Lastly, the Army

considered dispersion as a key element of doctrine.[39] Dispersion was the primary means of mitigating the effects of atomic destruction.

Dispersion of relatively small combat teams led to new defensive concepts such as "perimeter type mobile defense" and "island perimeter defense." These defenses relied on isolated battalions or battle groups dispersed throughout the width and depth of the battle area. These isolated formations were not mutually supporting and doctrine permitted gaps of up to 6000-9000 meters between units.[40] Placing units closer together created a lucrative target for nuclear strikes.

Doctrine preferred the mobile defense since the perimeter defense tied a unit to a specific piece of terrain. If a unit ties itself to a specific location then an enemy may expend a nuclear weapon to dislocate that unit. Mobile defenses also provided the defender flexibility to apply his combat power at the point and place he choose. Mobile defense uses dispersion and fluidity of action while maintaining initiative for the defender. Mobility was key to survival in nuclear warfare and the mobile defense allowed such mobility.[41]

Offensive doctrine also underwent modification. Prior to nuclear battlefield doctrine the offense used the traditional tenets find, fix, fight and finish with the last two considered the most important. Fight and finish received emphasis because of both their difficulty and cost in execution. Nuclear weapons shifted emphasis from fight and finish to finding and fixing the enemy. Once a defender fixes the enemy then a nuclear strike finishes the battle.[42]

Pentomic doctrine required units to move constantly. At the outset of battle units scatter widely to avoid presenting a lucrative target to the enemy's nuclear fires. As an attacking force fights through or around isolated units they would then come into contact with yet another unit in a continuous ebb and flow of battle. As the battle progresses, it is necessary to regroup armed forces to produce numerical superiority at a given point and time to annihilate the enemy.[43]

Since Pentomic doctrine called for extending one's combat power over greater distances in an effort to enhance dispersion, it was only logical to also apply combat power to the rear of the enemy. "Only by fighting the enemy in the front and rear in this manner is it possible to obtain local superiority without concentrations and to confront the enemy with strength in dispersal."[44] By attacking simultaneously throughout the depth of the enemy multiple battle groups could strike at the enemy. Figure 1 shows how multiple battle groups attack an enemy penetration.

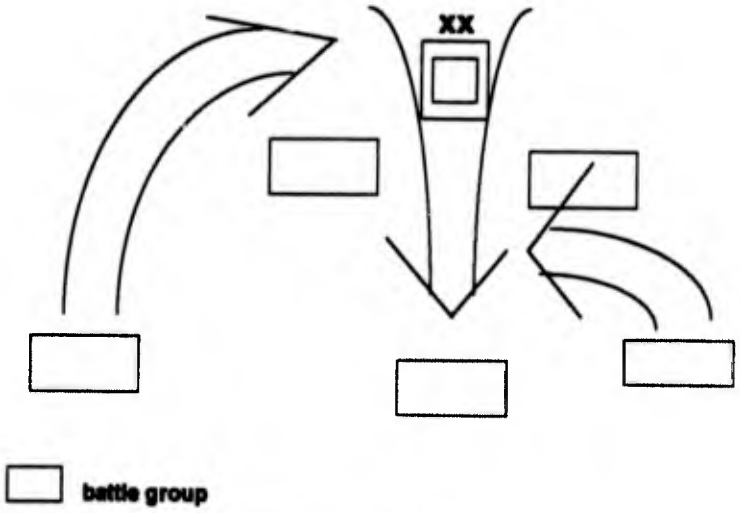

Figure 1
Battlegroups counterattacking an enemy penetration.

The tactics for the Pentomic Division required continuous movement of units to create dispersion, concentration and then dispersion to survive on the nuclear battlefield. Rapidly changing disposition of forces required highly trained units with a command and control structure that could react to ever changing environments. Unit missions changed from being able to capture terrain or positions to dominating areas through maneuver and firepower.[45] No longer could military forces hope to retain high ground and fortified positions and force an

enemy to assault. The enemy would simply eliminate the position through nuclear fires.

As Pentomic doctrine developed, the key concepts of dispersion, flexibility and mobility became integrated into every aspect of military operations.[46] A fluid, non-linear battlefield made set piece battle an anachronism of the past. Scattered units would be constantly moving and coming together at the requisite time to strike the killer blow. A unit dispersed from front to rear, laterally and in far greater depth than in previous wars. Increased dispersion would result in small unit actions becoming more typical with decentralized control much more pronounced. Since smaller units would fight independently, operational formations would have an ever greater reliance upon younger officers and non-commissioned officers to make tactical decisions.[47]

The absence of front line traces required flexible units able to fight in any direction and able to reorient itself at a moment's notice to enemy contact against any flank or the rear. The fluidity of the situation called for units to be able to rapidly shift from defensive to offensive operations with minimum lead times. Entire battle groups required unprecedented cross country mobility. "If units were to operate over greater areas, they must be able to move rapidly over all types of terrain to concentrate (mass) when and where needed to accomplish the mission."[48] The essence of mobility is the ability to bring superior force to bear at the decisive place and time. A Pentomic Division battle produces instantaneous changes in the time and place of those decisive moments that a division can overcome only through superior mobility.

Extended distances between units drove the Army to design self-sufficient battle groups who could fight alone for extended time periods. A battle group consisted of five rifle companies each with organic mortars. The headquarters company had a reconnaissance platoon, light tanks, 81 mm mortars and an

armored infantry squad. The division commander could attach to each battle group one tank company, one engineer company and one 105-mm howitzer battery. The resulting formation produced a combined arms' unit with capability to execute battlefield actions without additional support.[49]

Each of these requirements placed an extreme burden on the Army of the 1950's. While the doctrine told how the division should fight on the nuclear battlefield, the level of modernization, technology and overall wherewithal available to the combat units lagged way behind requirements. It is these deficiencies that led to the demise of Pentomic doctrine.

IV PENTOMIC DIVISION DEFICIENCIES

A. Impact on Tactics

Armies change doctrine to address perceived changes in tactical realities. Such changes also require substantial modifications to weapons, command and control capabilities and other tactical systems. During the 1950's the Army identified a wide range of modernization requirements. "Despite its best efforts, however, the Army failed to gain the required resources to accomplish its reshaping for the cold war era."[50] With the national strategy relying on nuclear weapons and their delivery means little money was available for the Army's conventional forces. The Army could gain funding for new missile systems, new nuclear weapons, advance air defense weapons and other such high technology enterprises. However, infatuation with nuclear related technology hindered the Army's efforts to acquire new tanks, infantry carriers and all terrain trucks. These items were tools of an old way of war and not needed for modern warfare.[51]

Another obstacle to the Army's modernization efforts was the huge surplus stockages left over from W.W.II. Developing new tank guns, artillery pieces and

other such equipment would make W.W.II ammunition and equipment obsolete and create a need to replace stocks of existing equipment. Additional spending for munitions was unacceptable to both the congress and the public.[52]

The emerging Pentomic era doctrine drove dramatic requirements for changes in technology for conventional forces. "The tempo and expansiveness of a (modern battlefield) would demand technologies providing improvements in speed, flexibility, range and precision."[53] Infantry could not walk to the battle on the nuclear battlefield. Wire communication was obsolete if units were constantly changing positions and alternating between defense and offense. Dispersion required wireless communications with extended ranges to cover the enormous width and breadth of a division's sector. Dispersion also required increases in artillery range and mobility to provide support within the division's sector. Each new requirement meant additional research and expenditure of resources to remedy.

As an example, on a nuclear battlefield a division's defensive layout would look something like Figure 2. To cover such an extensive area a division needs self propelled artillery with a range of ten to thirty miles[54] What the Army really wanted was an artillery system capable of placing individual guns six to eight miles from each other and from six to eight miles back from the forward edge of troops. If the guns had a range of 25 miles then the fire of four to six guns could strike a threatened sector.[55] Though the Army identified the requirement it could not obtain funding for the modernization program.[56]

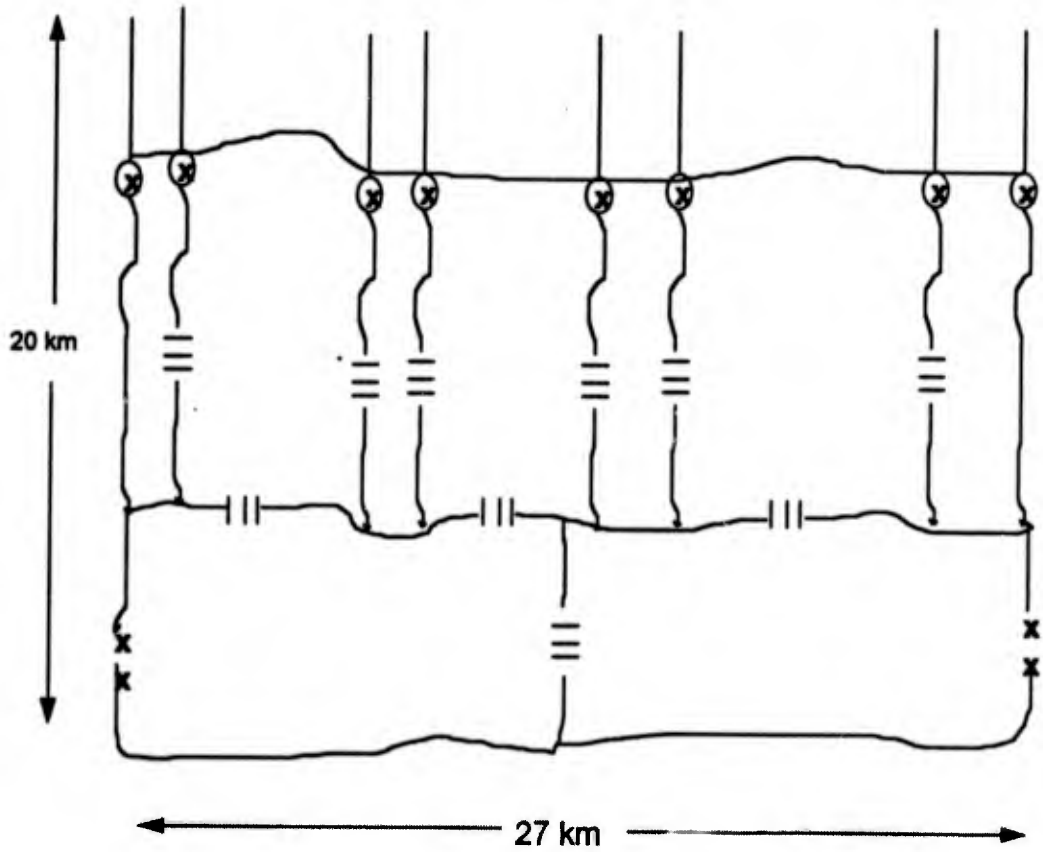

Figure 2. Pentomic Divison defense.

Increased dispersal on the battlefield required better communications than existing 1950's technology. As large military formations spread over greater distances radio becomes the only means to synchronize the separate unit actions. An appropriate communications system is a flexible network superimposed on an operational area. With this network any number of units could access the network with their radio systems at any point. The signal systems must be capable of moving freely on the battlefield without losing contact with either each other, higher headquarters or supported lower headquarters. Such a system provides even the smallest sections with their own communications and allows the requisite control desired by higher headquarters. No such system existed during the

Pentomic era and the Army never funded such a system while the doctrine was in effect.[57]

Finally, battle groups had to maintain some self sufficiency in logistics. The premise was that five relatively large formations with supporting divisional supply troops assigned would possess more sustainability then the old relatively large three brigade formations that relied on division for logistics. In reality "the degree of mobility and dispersion of the troops in the field is geared to, if not governed by the capabilities of the supply service."[58] As the formations spread out, the supply lines get longer making resupply difficult. Battle group formations obviously posed notable problems in training, ammunition supply, maintenance, and fire control of dissimilar weapons. The Headquarters and Support Company had to support infantry weapons, mortars, artillery, tanks, engineer vehicles and other various systems. Fuel, medical and other support also proved to be extremely difficult for the battle group to handle with limited support capacity organic to the unit.[59]

Budgetary constraints during the 1950's also led to manpower reductions with corresponding shortages of soldiers manning the supply services. The Army's infatuation with high technology exacerbated the problem by diverting much needed funds into high technology programs to the detriment of the conventional forces.

The Army's adoption of Pentomic doctrine and restructured forces quickly led to deficiencies in modernization, manpower and existing systems. "The initial concern was that the Army had traded its soldierly values for the promise of glossy high-tech equipment."[60] The glossy high-tech equipment of concern centered on the proliferation of nuclear weapons. The Davey Crockett system epitomized the depth of the problem. Davey Crockett was basically a nuclear bazooka with a range of just over a mile.

Davey Crockett and other similar systems placed a drain of manpower on the conventional forces. Forty-three percent of the 1957 Army's research and development budget went to missiles and nuclear weapons with only 4.5% going to new vehicle development.[61] Each new system required additional training and manning requirements that drained the Army of key personnel. "The problem was further compounded by the lack of combat service support and the field commander's decision to use combat troops to meet critical support requirements."[62] Pentomic Division doctrine envisioned fully manned and modern combat formations spread over large areas. What existed was undermanned forces with antiquated equipment barely suitable for fighting Korean Conflict type wars. The Army realized its dilemma and abandoned the Pentomic concept after a few short years.

B. The Fall of Pentomic Doctrine

Expanding Cold War pressures placed increasing demands on the United States to address continued threats throughout the world. These threats included expanding Soviet nuclear capability, enormous Soviet conventional capability and of particular concern, the growth of proxy wars between the super powers in developing countries. Each threat required serious thought and resources to mitigate and reverse Soviet gains.

President John F. Kennedy ordered the Defense Department to address new world realities. He tasked each service to develop forces and skills applicable in all social, economic, psychological and governmental conditions that fall short of total war.[63] The effect of this redirection by the President was to reorient the focus of the various branches within the Department of Defense away from a World War III scenario. There was an immediate impact on the military. The Air Force no longer saw its future solely related to strategic bombing. The Navy

expanded its view of warfare beyond the super carrier battle groups. The Army immediately began to address how to fight war in conditions unrelated to a nuclear battlefield.

President Kennedy re-focused the entire defense establishment by reshaping national defense policy. The previous two decades had similar incidents caused by changes in national strategy. Just like the late 1940's and the middle 1950's the country had to decide and prioritize the allocation of resources to prepare for the defense of the country. In the late 1940's the solution rested with strategic bombers. In the 1950's the military decided that missile technology was worthy of limited resources.[64] In the early 1960's the military had to again make decisions on priorities for funding, training and equipping itself for future war.

Soviet Union modernization of both its nuclear and conventional forces required the United States to implement modernization programs of its own. Decisions on modernization require reallocation of resources that produces discontinuity and dramatic changes in doctrine. President Kennedy stated in 1961;

> We must be prepared to make substantial contribution in the form of strong, highly mobile forces trained in this type (conventional) of warfare, some of which must be deployed in forward areas, with a substantial airlift and sealift capacity and pre-stocks overseas.[65]

Defense strategy changes from complete reliance on nuclear weapons to a strategy that recognized the role of conventional forces placed heavy burdens on an already strained budgetary process. "Science and Military leaders have the extremely complicated task of deciding the correct allocation of armed forces."[66]

The president's re-focus of the military establishment on conventional warfare forced an investigation of the ways that the military envisioned fighting war. Pentomic doctrine relied on nuclear weapons effects to provide the firepower necessary to defeat a numerically superior opponent. Reliance on nuclear fires inhibited Army thinking and diminished its capability to fight a large battle with a

conventional adversaryrces that came under duress during any training exercise or scenario alvl to nuclear fires to stem the tide of the opponent. The natural se exercises and their vision of future war led the Army to ignore real communications, weapons modernization and the entire concept of honal forces would shoot, move and communicate on the ba

President Kennedin focus for the military was a response to service neglect of convability.[67] The Korean war, the Hungarian Revolt, Cuban missile aina war all pointed to a need to reevaluate conventional war fightis. The doctrine of massive retaliation assumed nuclear weapcvays be available battlefield use, but, in reality, these weapons providee to real world events. The military needed a different model for war

> An interventionould have provided an operational concept far betthe tasks that political leaders subsequently dimy to perform. Viewing itself as an instrument for in highly politicized conflicts of limited scale would have Army over the long run to equip, organize and trs in ways far more pertinent to what they actually had to do.[68]

Doctrine addresses a pnotion of how military forces fight wars. If those notions change thmust also change to address new realities. Pentomic doctrine was model.

Pentomic doctrl a national strategy that assumed nuclear weapons were always any major conflict. During the late 1940s and 1950s the Air Force and the role of providing nuclear strike forces.[69] Vast resources went toequipping and fielding strategic bombers, super carriers and interallistic missiles in support of the new nuclear

strategy. The conventional Army struggled to identify roles and missions within the defense establishment.

Absent a clear vision of the Army's role in the nuclear strategy the Army floundered. "The lack of a doctrine that assigns the Army a definite and permanent mission has left them somewhat unsatisfied and even bewildered."[70] In response the Army focused its efforts on how to create an arsenal that allowed them to play the nuclear game. The task of fighting on a nuclear battlefield was secondary to ensuring that the institution survived. Though the Army could describe how conventional forces would fight on a nuclear battlefield it ignored the need to develop the systems necessary to execute the tactical doctrine. Numerous tactical deficiencies lead directly to deficiencies at the operational level of war.

V OPERATIONAL ART AND THE PENTOMIC DIVISION

A. Current Doctrine on Operational Art.

Army Field Manual 100-5 describes operational art as a process by which the military translates theater strategy into an operational design. This design integrates tactical battles and engagements that when executed properly leads to achievement of the strategic war aims.[71] It is the process of translation that ensures a linkage between tactics and national strategic goals. The levels of war; strategic, operational and tactical; are actually a continuum. To attempt to separate them for any purpose, other than for pedagogical reasons, is to miss the underlying relationship between each.[72] If "operational art is the skillful employment of military forces to attain strategic and/or operational objectives through the design, integration and conduct"[73] of military operations, then a change in strategy or tactics will influence operational art.

A properly grounded doctrine will address the fundamental environment that defines the conditions of war. Changes in technology, political realities and other factors also change the environment of war. This new environment "requires a different posture for (a) nation and (an) Army, both physically and intellectually."[74] Operational art is an intellectual process that requires such things as vision, an understanding of the relationship between means to ends and an understanding of risk.[75] Simultaneously the intellectual component of war must also consider and accommodate the physical component of war.

The U. S. Army during the 1950's provides a classic example of how changes in the desired tactical execution of war permeated the entire structure of the force from the lowest squad to national assets. The introduction of nuclear weapons in the strategic arsenals of both the United States and the Soviet Union forced the Army to rethink war fighting. The answer produced a new tactical doctrine. The Army's doctrine for employment of Pentomic combat formations provide insight on how operational art in the 1950's would support strategic aims.

The national strategy of massive retaliation required conventional forces capable of fighting on a nuclear battlefield. The Pentomic Division took national strategic policy and formulated tactical doctrine consistent with that strategy. The result was an Army intellectually capable of linking tactical actions with strategic policy but the disconnect was in the physical capability. Resource constraints produced an Army with antiquated equipment unable to fight any war much less a massive struggle with our greatest enemy under the most adverse conditions.

Using today's doctrinal definition of operational art, the military attempted to link strategic policy to tactical realities but overlooked key components. Even a cursory evaluation of 1950's capabilities indicated that the Army could not execute Pentomic doctrine. Strategic policy defined required military capabilities

to support national policy but the did not have the resources to obtain those capabilities. The Army could not execute the operational level of war.

The Army could not set military conditions in support of national objectives. The inability to execute the doctrine meant that the Army could not support the sequencing of actions to produce those conditions. Finally, the ability of a commander to apply resources within established limitations were questionable. If Pentomic doctrine was not viable, then the Army could not meet operational requirements.

The Pentomic division did not satisfy the American superpower requirements for flexible response in the fiscal constraints of the late 1950s. The Nation required an Army capable of fighting across the operational continuum anywhere in the world, but the need to fit into the new look strategy produced an organization that could function only in a nuclear war.[76] The Pentomic division's existence along side a national strategy of massive retaliation produced a force that lacked strategic and operational depth.

The Army Chief of Staff, General Taylor, published an alternative national military strategy in 1958. The strategy became known as flexible response. General Taylor felt that existing world conditions demanded a defense posture that would not automatically escalate to massive retaliation. The Nation needed a force structure that could operate in more environments than just a nuclear battlefield. While in hindsight General Taylor was correct, the reality of the times produced an Army leadership convinced that emerging force structure changes and doctrine did not meet the needs of the Nation. Taylor's variance with the approved national strategy indicates that the Army of the late 1950s could not link strategic aims with tactical actions, therefore the operational level of war was suspect.[77]

VI TODAY'S WORLD AND PENTOMIC DOCTRINE

A. Vision and Strategy.

Though dispersion, flexibility and mobility were 1950's imperatives to successful military operations their purpose was to maintain effective combat forces in a fluid, non-linear environment and to deliver decisive combat power at the right time and place. While the 1950's Army relied on nuclear weapons as basis for its vision, the underlying concepts contained in that vision is applicable to the 1990s Army and even for warfare in the 21st century. The Army Chief of Staff provided a similar vision when he stated:

> The American people expect decisive and quick victory. Such victory is best attained when our maneuver forces, working closely with our sister services as part of the joint team, overwhelm threat forces by a highly synchronized fire and maneuver. If we can plan and conduct simultaneous attacks throughout the depth of every sector to destroy, disrupt and control the threat information flow-if we can concurrently protect friendly capabilities to gather, generate and rapidly distribute information and then act upon it-we can attain decisive victory.[78]

Concepts such as "simultaneous attacks throughout the depth" imply dispersion to conduct distributed operations; "Synchronized fire and maneuver" demand superior mobility; and the ability to act on "rapidly" distributed information requires flexibility of the highest order.

Similar trends in vision led to the Army's adaptation of Pentomic doctrine with a "general agreement that ground force operations will be carried out in great depth with decisive aims at high speed."[79] While nuclear weapons produced the environment that drove the Army to this vision, technology led the Army of the 1990's to produce a similar vision. We see in this case that the conditions of the battlefield are vastly different but the underlying vision is the same.

One would assume that perceived battlefield conditions should be the driving force that defines how an Army prepares for the next war. However, even though two armies from two different era's faced dramatically different perceived environments, they both deduced similar imperatives to address dissimilar environments. Imperatives for the Pentomic battlefield are applicable for what the Army envisions for the future battlefield.

The recent bottom-up review determined that the Army of the future will no longer have to fight a massive conventional opponent on the plains of Europe. Instead the review determined that the Army force structure should allow it to fight two major regional contingencies (MRC).[80] Similarly, the Army of the 1950's believed that massive retaliation was a bankrupt strategy. The Korean Conflict and other regional conflicts of various sizes and intensity indicated a trend in future conflicts. This trend indicated the Army would fight peripheral wars of considerable magnitude that required the use of self contained, independent formations ready to fight anywhere in the world.[81] These requirements "demanded an Army with sizable forces in being, ready to move by land, sea, or air and fight any time, any place."[82] These strategic requirements for the Pentomic Army are similar to the strategic environment that are driving a new look at restructuring today's Army.

The extensive 1950s nuclear battlefield used independent combat teams widely dispersed to avoid the deleterious effects of nuclear warfare. Visions of future war also describe independent maneuver brigades and battalions isolated from one another and fighting similar to trench raiding parties in W.W. I. Such units perform extremely violent operations but are a tiny part of the overall struggle.[83] It is this similarity of roles and missions that link the vision of Pentomic unit employment to possible future military operations.

B. The Future Meets the Vision.

While Pentomic Division doctrine attempted to address the parameters of the military and strategic vision, reality prevented its execution. The Pentomic Division adopted the concept of dispersion- concentration- dispersion to create a fluid battlefield that would mitigate the enemy's use of nuclear weapons while simultaneously allowing friendly forces to concentrate at the decisive point to exploit enemy weaknesses or friendly success. The Army abandoned Pentomic doctrine because the Army could not execute the doctrine. The mobile, self-contained combat teams were neither mobile nor self-contained. Even worse, they were incapable of communicating with one another given the existing World War II communications equipment.[84] The Army of the future will have instantaneous communications through improved land based and satellite communications links.

> A fundamental change in C2, (command and control), establishing true joint "unity of command" for the first time in American history, along with the factors of qualitative manpower advantage, technological advances and the integration's of SOF, has given the US military a tactical superiority that is unlikely to be matched in the foreseeable future by any potential challenger.[85]

The 1950's Army accepted dispersed formations and assumed that command and control would allow the movement of these formations at the proper time and place. The integration of Inter-Vehicular Information System (IVIS), Global Positioning System (MPS), secure radio communications, satellite communications and other redundant systems down to the platoon level provide the means necessary to maneuver dispersed formations in a coordinated and cohesive manner.

Pentomic doctrine accepted separation of maneuver forces over vast distances without the ability to provide mutually supporting fires. Doctrine called for several kilometers of space between battalions not covered by direct fires.

Doctrine also required spacing individual artillery pieces over the entire sector so that a few tubes could provide coverage over a portion of the terrain. However, the lack of adequate range, mobility and command and control structure meant that the vision for the employment of artillery could never become reality.[86]

The improved C2 capabilities of the 1990's and the near future will obviate the failures of the pentomic doctrine. Improvements in mobility, range and lethality of weapons provide increased capacity for mutual support that was impossible for a Pentomic battalion or combat team. The Palladin artillery system allows calls for fire from a control center to individual, widely dispersed guns and rocket systems that can, for the first time, produce mass fires on the target without massing weapon systems.

Increased capability to shoot, move and communicate has for the first time taken the ability to mass fires and effects above the platoon and company level. A Pentomic division commander could only hope to move individual units around the battlefield to produce mass. The modern division commander can not only shift formations to produce mass, but he can also shift fires to produce mass.

> Now by applying new technology to the principle of mass, a given force can effectively attack many targets simultaneously. Massing at the operational level instead of the tactical level allows the attacker to overwhelm an entire target set or even several target sets in one attack.[87]

Tactical and even operational commanders can control open space on the battlefield between independent units with improved acquisition and accuracy of direct fire weapons and the improved ability to bring long range indirect fires with pin point accuracy.

Limited weapons range, mobility and communications capability in a Pentomic division meant that reality could not meet the vision that the doctrine described. Introduction of new technology mitigates these shortfalls to the point

that a modern division now has the ability to reach the vision prescribed by Pentomic doctrine. Since similarities exist in employment imperatives, roles and missions and doctrine perhaps the Army of the future can adopt Pentomic doctrine and force structure to meet the requirements of 21st Century warfare.

C. Have We Found the Answer?

If Pentomic doctrine and force structure provide a framework for the Army of the future, then it must provide an Army that can support the national strategy. As with any theory or vision that attempts to predict the future, one must be careful not to be too wrong, particularly when it comes to the serious business of war. Those who are currently predicting the future, making decisions on force structure and making major modifications to doctrine are always facing a difficult problem. War is a complex weave of interacting forces that do not lend itself to generalization without risking oversimplification. Pentomic doctrine predicted a nuclear battlefield in which nuclear release would always be available. It also presumed sufficient warning of escalation to allow the Army to shift forces from overseas and on the battlefield to mitigate the use of nuclear weapons by the enemy. The Army relied on nuclear technology to compensate for inadequate conventional capability.

Similarly, the Army believes technology can compensate for reduced manpower and force structure in a modern Army faced with extreme reductions in end strength. "Electronics have forever changed the equation. The promise of technologies as a force multiplier in the substitution of firepower mass for manpower mass has finally been realized."[88] This presupposes that a military force can control the free flow of electrons, the enemy will be unable to stop our exploitation of electrons and the enemy is susceptible to the effects that this flow

of elections will bring to bear on the battlefield. If this litany of suppositions becomes invalid, then the lack of manpower in the military could prove disastrous.

As with any phenomenon, the primary effect is recognizable and usually produces predictive responses. It is the second and third order effects which usually causes consternation and difficulty in implementations. The explosion of technology that leads to information highways will provide a vast array of information to the modern military leader. The first order effect is to give the military leader an unparalleled view of the battlefield. The second order effect that has yet to be solved is the problem of information overload. The sheer size, speed and volume of information that will inundate the commander could produce paralysis in the heat of battle.[89] Even more unnerving is the prospect of how a military trained to have instantaneous information about all facets of the battlefield will react when the enemy disrupts that flow of information. Skills based on manual manipulation of information are transitory at best and degenerate as the reliance on technology further permeates the military.

Similar to the 1950's Army, the 1990's Army is facing pressure to replace manpower with technology.

> There is a growing propensity among political strategists and Congress to accept the notion that "high technology" warfare obviates the need for extensive numbers of ground forces in future war.[90]

The overwhelming Gulf War victory seemed to validate this belief among politicians and military experts that technology can substitute for manpower.[91] The failure in using the Gulf War as a validation for the superiority of technology over manpower is that the Iraqis did not put up a fight. The Iraqis occupied indefensible terrain allowing use of maximum effective ranges of our technology. The enemy lacked the convictions to engage in mortal combat. Many scenarios exist that take away the advantages that favored the coalition forces.

Just as the Pentomic division suffered due to manpower shortages, jungle warfare, Urban warfare, guerrilla warfare and a multitude of operations other than war are a few examples where a very small modern Army would find it difficult to fight successfully. For an open maneuver attack, the attacking force needs only a 3-1 advantage in application of force. This differential can derive from manpower, firepower or the synergism of simultaneous attacks throughout the depth of the maneuver space. In urban warfare, the attacking force must have a 15-1 advantage or greater. Urban warfare defended by hardened soldiers willing to fight does not lend itself to simultaneous attacks in depth or to synergistic effects of various weapon systems. Instead, the attacker must make a methodical attack, clearing and occupying each respective building while suffering ever increasing casualties that are inherent in urban fighting. Transition from open maneuver warfare to urban warfare produces an exponential increase in the need for individual soldiers.[92]

A small, modern Army that relies too much on technology and machines becomes bound by those same machines. If an Army is to be successful it must not only adapt to changing technology but it also must address other issues that the technology may not alleviate. While strong, balanced doctrine may provide integration of new technology, it cannot alleviate the requirements that exist in all situations. Adapting technology to military needs requires realistic appraisals of actual military environments and force requirements.

Pentomic doctrine adapted nuclear technology for an Army struggling to define a mission. The doctrine described tactics for the application of conventional forces faced with operations in open maneuver space decimated with multiple nuclear explosions. In this scenario the enemy had massive conventional capability with similar equipment. Reality, however, required an Army capable of fighting in disparate environments against a spectrum of opponents that would not fight as the

Army envisioned. Pentomic doctrine failed to link strategic needs with the true needs of both the Army and the nation.

The Army of the late 1950s prepared itself for pitched battle against a symmetric army just as the mainstream Army of the 1990's prepares itself to fight pitched battles over open terrain against similarly equipped opponents. Today that scenario is on the verge of being obsolete. Recent trends in force deployment indicate that the threat facing the United States today consists of many small wars over a variety of terrain. It is difficult to identify a single nation capable of fielding a viable combined arm's threat with large scale mechanized forces. The United States' overwhelming superiority in fire control, communications, aerial dominance, space based platforms and a host of other factors tend to indicate that our military could overwhelm any conventional opponent in a decisive campaign to destroy the enemy's war making capacity.

Other forms of warfare produce an entirely different problem. Our current doctrine describes a spectrum of military operations. This spectrum requires the military to execute nuclear war, conventional war, peacemaking, peacekeeping, peace enforcement, strikes, raids, anti-terrorism, etc.[93] The first two falls under the heading of "war." The remaining list fall under a new doctrinal category called "operations other than war."

Each type of activity should strive to link military operations to national strategic objectives that is the essence of operational art. Each of these activities requires a military to have an appropriate level of equipment, training and manpower to execute. As long as the Army remains fixated on large armored force maneuver warfare, it may be unable to meet the contingencies that actually arise. As the Army searches its soul for a role in the future it must come to grips with the type of war the nation will prepare to fight. Currently the type of war looks to be vastly different from the Cold War Paradigm.

VIII CONCLUSION

The Army of the 1950's faced political, budgetary and public pressure that drove it to reevaluate its force structure. The public and political forces looked at World War II and concluded that the United States ought to avoid any future war that might require million man armies facing and cost thousands of lives. Instead, the advent of nuclear weapons and related technology became a panacea to obtain security without the cost of a large standing conventional force.

As the Army reflects on the forces that are forging current defense policy, one observes many similarities. The American public and the defense establishment of the 1950s like today believe that war has become too expensive. Large standing forces place almost an unbearable burden on a nation's treasury. The search for an easy answer returns us to reliance on technology. Air power and long range missiles manned by a few highly trained individuals seem to be the easy solution. Such systems supported by information and communications technology will allow the application of overwhelming combat power at the decisive point.

The risk today's Army is accepting by relying on technology is very similar to the risk the Pentomic Division adopted. The nation's armed forces will defeat numerically superior forces by having better people, better equipment and a better understanding of how to bring combat power at a decisive point. However the enemy of today can be like the enemies of the 1950's and 1960's. They can fail to provide or accept a decisive point. Nations like North Korea, Vietnam, Serbia and others are more than willing to cede technological superiority to the United States. Instead they will bleed the nation by fighting a protracted war over inhospitable terrain. The only way of defeating them will be to apply manpower to ferret them out of the hills, jungles and urban centers.[94] The Army needs to adopt a doctrine that can support patience, perseverance and a willingness to commit manpower to fight in such an environment.

Such a doctrine I conclude that our existing division organization is archaic. Perhaps an Bosed of independent, self-contained battle groups is a possible solue future. The Pentomic division envisioned just such a force structure. ny searches for solutions to the many roles and missions facing the Arm into the next century, it is useful to know some similar problems and thas existed in the Armies recent history.

The Army is inv how to organize, train and fight the future battles. It may do well ck at a time when the Army struggled under similar conditions. The ny faced very similar outside influences; the Army faced a battle ove missions and the Army faced very real dilemmas on how to exmited resources provided by a cynical political apparatus. The answer Pentomic doctrine. Perhaps an investigation of the forces that drove thsuch a solution can help today's Army avoid similar problems as it atdefine itself for the 21st Century.

Current Army tlcribes simultaneous attacks in depth on a fluid, non-linear battlefield. Smic doctrine addressed conventional forces fighting under a similar l environment one may conclude that a doctrine that considers lessons lm the Pentomic era may meet the needs of 21st century warfare. Whater becomes the vision for our Army, military leaders must always be at if the Army adopts significant changes in national military strategucture and tactics then issues that affect operational art will also

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[21]David l. Melcher and John C. Sieman, "How to Build the Wrong Army" in Military Review, Sept 1992, p. 74.

[22]David l. Melcher and John C. Sieman, p. 74.

[23]Rose, p. 31. This section contains quotations from Churchill, MacArthur, Oppenheimer, and several military review articles from assorted military writers which stated a general perception that war was now too violent to wage in any form. The threat of escalation to all out nuclear exchange would forever temper any nation from going to war.

[24]Bacevich, p. 10.

[25]Bacevich, p. 53.

[26]Bacevich. p. 144.

[27]Larry A. Addington, The Patterns of War Since the Eighteenth Century, Indiana University Press, Bloomington, In, 1984, p. 262.

[28]Bacevich p. 63.

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[29]Theodore C. Mataxis and Seymour L. Goldberg, Nuclear Tactics, Weapons and Firepower in the Pentomic Division, Battle Group and Company. The Military Service Publishing Co., Harrisburg, PA, 1958. Chapter 2 gives a good summary of nuclear weapons effects that concern military operations. p. 11- 29.

[30]Bacevich, p. 136.

[31]Rose, p 70.

[32]Rose, p 90.

[33]Otto Heilbrunn, Conventional Warfare in the Nuclear Age, George Allen & Unwin Ltd. London. 1965. p. 114.

[34]Bacevich, p. 105.

[35]Heilbrunn, pp. 52-55. This discussion on the nuclear battlefield was summarized from the description provided in Heilbrunn. A similar discussion is in Nuclear Tactics by Theodore C. Mataxis and Seymour L. Goldberg.

[36]Heilbrunn, p. 100.

[37]Heilbrunn, This paragraph and the comments contained on the next two pages which describe the broad concepts of conventional force tactics on a nuclear battlefield are paraphrased from pp. 54-59.

[38]House, p. 158.

[39]Rose, p 99-102.

[40]Theodore C. Mataxis and Seymour L. Goldberg, Nuclear Tactics, p. 126-129.

[41]Rose, p. 70.

[42]Mataxis and Goldberg, p. 160.

[43]Heilbrunn p. 95.

[44]Heilbrunn, p. 104.

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[45]Heilbrunn, p. 45.

[46]Bacevich, p. 70.

[47]Rose, p. 66.

[48]Rose p. 69.

[49]House, p. 155.

[50]Melcher and Siemer, p. 74.

[51]Bacevich, Detailed discussion of the ramifications caused by allocating the preponderance of resources to missile and warhead technology is found on pages 85-102.

[52]Bacevich, p. 70-75.

[53]Bacevich, p. 71.

[54]Heilbrunn, p. 75.

[55]Heilbrunn, p.. 58.

[56]Melcher and Siemer, p. 74
[57]Heilbrunn, p. 123.

[58]Heilbrunn, p. 127.

[59]House, p. 155.

[60]Melcher and Siemer. p. 72.

[61]Bacevich, p. 100.

[62]Melcher and Siemer, P. 72.

[63]Rose, p. 96.

[64]Russell F. Weigley, The American Way of War. Indiana University Press, Blommington, IN, 1977. Chapters 16 and 17 provide a could discussion of the reliance on particular weapons delivery techniques during the 1940s and 1950s.

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[65]Rose p. 95.

[66]Heilbrunn, p. 34.

[67]House, p. 158.

[68]Bacevich, p. 152-153.

[69]Weigley, p. 375-381.

[70]Bacevich, p. 145.

[71]FM 100-5, Operations, Headquarters Department of the Army, Washington, D.C., June 1993.p. 6-2.

[72]John A. Warden, The Air Campaign. p. 8.

[73]FM 100-5, p. 6-2.

[74]Fredrick M. Franks Jr., "Full Dimensional Operations" in Military Review, Dec 1993, p. 5.

[75]FM 100-5 p. 6-2.

[76]Melcher and Siemer, p. 70.

[77]Melcher and Siemer, p. 72.

[78]Gorden R. Sullivan, "Moving into the 21st Century: America's Army and Modernization", in Military Review, July 1993, p. 9.

[79]Heilbrunn, p. 40.

[80]Ike Skelton, "Joint and Combined Operations in the Post-Cold War Era" in Military Review, September, 1993. p. 8.

[81]Bacevich, p. 47.

[82]Bacevich, p. 43.

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[83]Chris Bellamy, The Future of Land Warfare, St. Martin's Press: NewYork, 1987. p. 299.

[84]House, p 156-157.

[85]Wayne L. Maynard, "The New American Way of War," in Military Review, November 1993. p. 16.

[86]Heilbrunn, p. 119.

[87]Edward Mann, "One target, One Bomb," in Military Review, Sept 1993. p. 40.

[88]Maynard, p. 10.

[89]Martin C. Libichi and James A. Hazlett, "Do We Need an Information Corps?", in Joint Forces Quarterly, Autumn 93, p. 89.

[90]Melcher and Seimer, p. 75.

[91]Thomas A. Keaney, "Gulf War Airpower" in Joint Force Quarterly, National Defense University Press, Fort McNair: Washington D.C. Autumn 1993. p. 25-26.

[92]T. R. Milton, Jr., "Urban Operations: Future War," in Military Review, February 1994, p. 42.

[93]FM 100-5, Operations, Headquarters Department of the Army, Washington, D.C., June 1993. p. 2-1.

[94]T. R. Milton, Jr., "Urban Operations: Future War," in Military Review, February 1994, p. 42.

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