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## USAFA Harmon Memorial Lecture #12

"The Historical Development of Contemporary Strategy"

Theodore Ropp, 1970

This may be a nonlecture from nondocuments about the superpowers' "loud cries and shining objects"; containment victories which were often nonhappenings; and military victories by countries that are by traditional standards nonpowers. In 1967, 93 such powers, with gross national products of \$186 per head, spent \$8 on defense to \$7 for public health and education combined, while 27 developed states with GNPs of \$2141 put \$170 -almost the others' GNPs- and \$150 into those services.<sup>1</sup> But these crude figures concealed gross military inequalities within each development category and even greater confusion- a quarter of a century after the most total general war in history- about the external and internal uses of military force, national and alliance strategy, and even the concept of victory.

Strategy is an expansion of "stragem," a term used by Charles James in 1802 for "the peculiar talent" of the French "to secure their victories more by science [and well-concerted feints] than by hardihood." Stratarithometry was "the art of drawing up an army."<sup>2</sup> To Carl von Clausewitz strategy involved both concepts: the "assembling of military forces" and "the use of engagements to attain the object of the war."<sup>3</sup> The 1962 Dictionary of United States Military Terms for Joint Usage expanded this to the "art and science of developing and using political, economic, psychological and military forces...during peace and war, to afford the maximum support to policies, in order to increase the probabilities and favorable consequences of victory and to lessen the chances of defeat,"<sup>4</sup> while the 1964 United States Air Force Basic Doctrine put "victor" in an all-out war in quotation marks, and defined "'defeat' of the enemy" as "the attainment of our specific political objectives."<sup>5</sup>

To untangle contemporary military strategy from politics and technology, we will limit ourselves to some hypotheses about (1) its special features, (2) its modern background, and (3) its historical development since Clement Attlee, "on what may have been the most important mission ever undertaken by a British Prime Minister,"<sup>6</sup> flew to Washington in October 1950 to ask President Harry S. Truman not to use nuclear weapons in Korea and the dismissal of Douglas MacArthur as United Nations Supreme Commander the next April.

### Some Special Features of Contemporary Strategy

These events lit up two features of contemporary strategy: the unwillingness of the strongest power to use all of its weapons and the unification of the world conflict arena. Both came from that deliberate and continuous application of science to military technology which was to enable the USAF Basic Doctrine to say that "technological and tactical improvements must be continuous," and which had so multiplied mass by mobility that "all of the centers of civilization," as Gen. H. H. Arnold had written in 1946, would soon lie "within reach of destruction."<sup>7</sup> To some twentieth century followers of Alfred Thayer Mahan, Halford Mackinder, and Giulio Douhet, "he who controls the sea [or Heartland, or air] controls the world." In the past two decades there has been little question as to who has controlled each element but a great deal of question about the world being controlled by their controllers, once we leave the world of technology for those of politics and ideology.

The resulting confusion is not uniquely American, but with strategy's language now as American as it was once French or German, the resulting problems can be suggested by American heraldic examples. This Academy has an eagle and his missiles, Annapolis Ex Tridens Scientia, and

West Point that "Duty, Honor, Country" in which Samuel P. Huntington sees "the military ideal at its best... a gray island in a many colored sea, a bit of Sparta in the midst of Babylon."<sup>8</sup> All officers wear the Great Seal's eagle and "new constellation" breaking through the clouds. The reverse-on the currently ailing dollar bill-has the Eye of Providence and *Novus Ordo Seclorum*, a New Order of the Ages which has been as Messianic as any of the others in this century.

The Americans and Russians have been, by their previous standards, militarily and technologically successful. In Vietnam their strategies have been very largely determined by political and ideological considerations. As the ideologue of containment, George F. Kennan, later noted, the world Communist- or capitalist, or imperialist- conspiracy "is both a reality and a bad dream... but . . . its deepest reality lies . . . in its manifestation as a dream."<sup>9</sup>

No superpower is militaristic. Their soldiers are curbed by the Party, ours by Huntington's "historical constants" of a "liberal ideology and conservative Constitution" which made "civilian control depend upon the[ir] virtually total exclusion . . . from political power." They could not dominate an 1890 society which had 28 times as many physicians as active duty officers (104,805 to 3,718), where there were only 26,703 of the latter in 1938, and where physicians were more numerous (203,400 to 181,467) as late as 1950. So American soldiers accepted late nineteenth century ideas of war as "an independent science" <sup>10</sup> and their society's technological bias. The Chinese, for their part, had to believe in morale and manpower, and the Russians had to try harder at both technological and revolutionary development.

While technology and the unification of the conflict arena have tended to make contemporary strategy more scientific, deterrence may be a nonevent and sufficiency argued from the worst ideological and political nightmares. We will say more about American strategy under these four conditions, partly because we know more about it, but mainly because- from the original decision for containment- the Americans generally retained the technological initiative, if only because of a possibly exaggerated fear of losing it as well. With contemporary soldiers rather less conservative than many successful soldiers of the past, the rate of technological change correspondingly greater, and more emphasis on deterrents, our strategic models are, fifth, even more speculative than those of the relatively peaceful eras after the Frederician, Napoleonic, and Moltkean military revolutions. Those peaceful eras were, as yet, longer than ours, but we have reached 1788, 1840, and 1896 on 1763, 1815, and 1871 time scales, and the confusion of contemporary strategists is analogous to that of those generations.

## The Modern Historical Background

Ferdinand Foch's 1903 *Principles of War*<sup>11</sup> saw modern war as beginning with the French Revolution. Since then, as we have just noted, there are analogies to contemporary dilemmas in the peaceful generations (1891-1920, 1831-1860, 1771-1800) which we have arbitrarily worked back from 1950 to the Comte de Guibert's proposals for French military reform of 1772. Paradigms or models are what the philosopher Alfred North Whitehead called "ideas about facts." Thomas S. Kuhn sees *The Structure of Scientific Revolutions* in terms of alternating "puzzle-solving" and "paradigm-testing" eras. He sees no regular generational patterns in science, but the application of his model to the roughly generational alternations of peace and war since 1763 gives a new look at modern military paradigms. The dilemmas of the 1970s are not the same as those of 1790, 1850, or 1910, but they reflect similar difficulties of military reform and model-testing in peacetime.

In "normal" or "puzzle-solving" eras, scientists work within agreed systems. Tests of "anomalies" are "trials only to themselves, not of the rules of the game. They are possible only so long as the paradigm itself is taken for granted. Therefore, paradigm-testing occurs only after persistent failure to solve a noteworthy puzzle has given rise to crisis . . . [and] only after the sense of crisis has evoked an alternative candidate for paradigm. . . [These] ordinarily incorporate much of the [old]

vocabulary and apparatus. . . . But they seldom employ these borrowed elements in quite the traditional way. Within the new paradigm, old terms, concepts, and experiments fall into new relationships."12

Guibert and other French military reformers, 1771-1800, suggested uses for those democratic and national "passions" which helped Napoleon force the old monarchies to use them to defeat him, 1801-1830. The Industrial Revolution's railways, steamships, and telegraphs made it possible to move and control even larger conscript armies, 1831-1860. The Russian General Staff's solutions to its puzzles made a united Germany the strongest land power in Europe, 1861-1890. The Great War showed that armies could not move against still newer rapid-fire weapons, 1891-1920. Mechanization brought more than Napoleonic and Moltkean victories, 1921-1950, and set total war problems with which our generation's soldiers and politicians are still struggling.

If the best answers to why it takes them so long to reform lie in the generational patterns of modern wars and revolutions, this question is often answered by clichés about military minds and military-industrial educational-political complexes. They all now want progress, but they must follow tested routines, and their leaders are committed to historically justifiable "ideas about facts." So doctrine easily becomes dogma- more hair of the one that bit you- and reformers get short shrift until "persistent failure to solve a noteworthy puzzle" produces "crisis." Joy was good ecological politics until people could not fish the Detroit and could smell the Potomac River.

New ideas come from many sources but are most likely to be adopted by weak or defeated powers. France had done badly in the wars of the mid-eighteenth century. Prussia was the weakest of the powers in the early eighteenth and nineteenth centuries. But alternatives must look practical. If mechanization was one solution to the Great War's tactical puzzles, Russia had no industrial base for all-out mechanization and China needed an antimachine model to compensate for even greater weaknesses. The Americans, on the other hand, had the industrial power to adopt "British" ideas of mechanization and "German" science-based military technology to project their armed forces across two oceans, while husbanding their relatively scarce manpower resources. And, if Charles de Gaulle's abandonment of the nation-in-arms was to be revolutionary in terms of modern French history, it was highly practical for a former great power which felt that it needed a finger on the American nuclear trigger. But it was to be still more practical, in terms of economic development, for other former great powers to pay only lip service to the military power game. This model met American ideas of fighting internal Communism with butter instead of guns, showed trust in American leadership, and helped the Americans legalize superpower nuclear supremacy by nuclear nonproliferation agreements.

As the collective brain of the Prussian Army, the General Staff was one of those institutions which sparked what William H. McNeill sees as the "accelerating self-transformation" of modern Western civilization by "deliberate innovation."13 Foch's model of strategy combined the Prussians' peacetime "preparation," planning, and indoctrination of the French Revolutionary nation-in-arms with Napoleon's "mass multiplied by impulsion" to break the enemy's "moral and material resources" in battle."14 But soldiers' use of what Whitehead saw as the nineteenth century's "invention of the method of invention" by "disciplined attack upon one difficulty after another,"15 was hampered by the lack of field testing of the differences between Foch's "mathematical demonstration" that "any improvement in firearms...ultimately . . . strength[ens] the offensive" and the economist and banker Ivan S. Bloch's figures and tables on tactical and strategical stalemate, economic ruin, and political and social revolution in *The Future of War in Its Technical, Economic, and Political Relations*.16 With the tests of the relatively peaceful decades of 1891-1910, 1831-1850, and 1771-1790 comparatively inconclusive, puzzle-solvers stuck to solvable puzzles, dogma hardened, rhetoric inflated, and organization men toed the line until the wars of 1911-1920, 1851-1860, and 1791-1800 set the "more significant" problems and "alternative candidates" for paradigm. The Chief of the German General Staff, Alfred von Schlieffen, agreed with Bloch on frontal attacks and planned to Cannae the French army by enveloping it through neutral Belgium.17 But there were no scientific, joint, or political staffs to check on the "difficulties" or "anomalies" in this or any other army staff's 1914 preparations.

We can now figure that every man in Bloch's "earthen ramparts" had 42 times the firepower of one of 1814 or 16 times that of one of 1864 to hold only 10 to 12 times as much ground. Machines poured men and munitions into the trenches. Their attackers walked and carried everything into the "storm of steel" at a Roman 2 miles an hour. While offensive machines first mass-produced (the submarine and airplane) or designed (the tank) during a 4-year war were not decisive, J.F.C. Fuller with B. H. Liddell Hart, the prophet of a mechanized Blitzkrieg- saw war now demanding "(1) Political authority; (2) economic self-sufficiency; (3) national discipline; and (4) machine weapons."18 And some mathematical formulas for operational analysis of these weapons had been developed by the automotive engineer E.W. Lanchester for dealing with the new and critical problems of Aircraft in Warfare. 19

During the 1918-1939 Armistice every great power adopted some version of Fuller's formula. None took all of Douhet's views of the airplane as "the offensive weapon par excellence," an independent and primary air force, and the "disintegration of nations" once indirectly done by attrition, blockade, and subversion now being "accomplished directly" by terror bombing.20 The Anglo-Americans preferred economic targets, but technology and politics made them smash and burn cities anyway as war- as Clausewitz had feared with "the participation of the people in this great affair of state"- approached those absolutes of violence, range, and ideological and political pressures which feature contemporary strategy. After Adolf Hitler, Joseph Stalin, and Calvin Woodrow Foster, there seemed to be little that developed nations would not do. "Bounds, which only existed in the nonconsciousness...of what is possible... are not easily built up again; and ... whenever great interests are in question, mutual hostility will discharge itself in the same manner as... in our time." If strategy, in another Napoleonic definition, is the art of the possible, these wars had so expanded its possibilities that "not until the enemy lay powerless on the ground was it supposed to be possible to stop and come to any understanding with respect to the mutual objects of the contest. "21 Two total wars had developed total weapons, mobility, states, and total victory for some powers and total defeat or exhaustion for others.

### The Development of Contemporary Strategy

American presidential dating puts Russia's containment in the first Truman Administration and its extension to China in the second, views massive retaliation in Eisenhower's first term as giving way to an incipient flexible response strategy in the second, and views the Kennedy-Johnson as more successful than the Johnson Administration. The immediate postwar era saw the usual institutionalization of successful wartime agencies, a separate air force, conscription, and the creation of a Department of Defense. Its internal conflicts were increasingly managed with the mathematical social science tools of the wartime Strategic Bombing Survey, and by military intellectuals from the public-private USSBuses of the Research and Development (RAND) Corporation and other tanks for Thinking about the Unthinkable. 22

Eight of the ten Secretaries of Defense have been businessmen or lawyers. After a generation in which increasing machine production had been the main American-and Russian-military problem, "Engine Charlie" (Charles E.) Wilson's "more bang for a buck" or Robert S. McNamara's "cost-effectiveness" systems analysis program packaging sounded scientific to politicians whose control over soldiers was through the budget. Then, in something of a reversal of roles, President Richard M. Nixon chose a civilian military intellectual, Henry A. Kissinger, to advise him on strategy, and a professional politician, Melvin R. Laird, to get "(1) clear and concise policy direction; (2) full participation in the decision-making process; (3) an open information policy; and (4) decentralized management with accountability in defense administration."

Victory over Germany's machines had brought Russia into conflict with the Americans. Her European conquests could not protect her from American air power, although her ground forces and

local Communists could threaten Western Europe. The Russians read the war's lessons- and their need for air power and absolute weapons- in American terms. A conservative strategy was linked with "technological and tactical improvements" in a policy which appealed to the surviving Stalinist apparatchiks to whom even the surface fleet expansion of the 1960s may have been justified by the old imperialist rules for showing the flag.

Both superpowers had misread Mao Tse-tung's "more significant" thoughts on countering his enemies' superior machines by hiding his Party and Army in the population of his "vast semicolonial country...unevenly developed politically and economically." He exploited the great powers' conflicts and the xenophobic nationalism of nearly self-sufficient "stagnant rural areas...far from outside help,"<sup>24</sup> control, or machine attacks, until his friends' machines and enemies' mistakes had given them Communists China, half of Korea, and Vietnam in wars which, by 1954, had already lasted longer for Mao than those of the French Revolution and Empire.

In paradigm-testing, to use Pablo Picasso's phrase, "the against comes before the for." As MacArthur told the senators investigating his dismissal in 1951, "scientific . . . mass destruction" and "the integration of the world" had "outlawed the very basic concepts upon which war was used... to settle international disputes."<sup>25</sup> Arnold had already shown- with Japanese cities destroyed at "1 square mile for 3 million dollars" and future costs of "less than half a million"- that "destruction by air" was "too cheap and easy." A "possibility of stalemate" meant forces "built around atomic weapons," but not around them "alone,"<sup>26</sup> for a New Warfare defined by C. N. Barclay in 1954 as "the means by which a nation (or group of nations) seeks to impose its will...by all means short of total war, and without disturbing its own economy to an extent which is unbearable, or unacceptable, to its people. The methods include: propaganda, obstruction, planned mischief, underground war, sabotage, intimidation, bribes, armed threats, limited war, and wars by proxy."<sup>27</sup>

Kissinger's 1957 Nuclear Weapons and Foreign Policy would meet "the difficulty...of holding a perimeter of twenty thousand miles while always remaining on the defensive politically, militarily, and spiritually" by limited offensives. Much "of the perimeter encompasses countries which are in rapid flux...in some countries forces hostile to our interests will gain ascendancy...The side...with faith in victory has a decided advantage over" that which wishes "to preserve the status quo" and will "run greater risks because its purpose will be stronger," while "each move" opens other possibilities, and forces the enemy "to concentrate on purely defensive measures. This does not mean preventive war. . .Principle would prohibit such a course apart from the enormous destructiveness of modern weapons." But "a doctrine and a capability for the graduated employment of force" would change our "traditional . . . overemphasis on total solutions," and supplement our massive retaliation strategy "with subtler military capabilities which address themselves to the likelier dangers and involve a less destructive strategy."<sup>28</sup>

By the 1960s American military intellectuals and civilian administrators were near agreement on a new military paradigm, though not on McNamara's administrative methods or on Kissinger's feeling that "the diffusion of nuclear weapons technology will be to our net strategic advantage." But McNamara's "no first strike" strategy was to be linked with Kissinger's leaving "no doubt that all-out war would mean disaster for the Soviet bloc," and his "no cities" pledge agreed with Kissinger's modification of "the principle that wars can be won only by dominating the airspace completely. . . . The minimum condition of limited war will be the immunity of the opposing strategic striking forces." Towns "not used to support tactical operations" and cities "more than five hundred miles from the battle zone" might be immune, and "the elimination of area targets will place an upper limit on the size of weapons it will be profitable to use."<sup>29</sup> And their opponents might see all this as moralistic verbiage by reformed city smashers, or as justifying nuclear nonproliferation or arms pacts in which they, as less moral, would accept permanent inferiority.

"Forecasting' is to the modern mind"- Bertrand de Jouvenel notes in *The Art of Conjecture*- "the forecasting of figures."<sup>30</sup> If technology's facts are as hard as its calculations are cold, Clausewitz

saw that while the estimation of "means" in "figures" was possible, "the strength of the will is much less so and only approximately to be measured by the strength of the motive behind it."<sup>31</sup> The summit meetings of 1955 were followed by Suez, Hungarian, and Lebanese crises, Sputnik, and Fidel Castro. By 1960 an alleged "missile gap" and economic stagnation were issues in a close presidential election. Charles J. Hitch and Roland N. McKean's *Economics of Defense in the Nuclear Age* saw "all military problems" as partly "economic problems in the efficient allocation and use of resources," and Russia, by putting more of its more rapidly growing GNP into arms, matching American defense spending by 1965.<sup>32</sup> The Bay of Pigs and Berlin Wall added to the gloom in 1961, and the historian, W. K. Hancock, feared that the Americans might "throw in their hand before the Russians," because they would not accept the peacetime controls necessary for "a high rate both of industrial growth and of defence expenditure."<sup>33</sup>

Victory in the 1962 Cuban missile crisis, the Sino-Soviet split, Marxist economic troubles, and a capitalistic boom were the backdrops for the 1964 USAF flexible response Basic Doctrine for "military contests from thermonuclear exchanges to guerrilla and counter guerrilla activities. . . . Thermonuclear weapons and assured delivery capability . . . have altered the use of total military power . . . [and] are likely to cause unacceptable damage even to the 'victor.' Hence, an enemy capability to destroy our cities demands . . . objectives more prudent than his total defeat," or even that of "a lesser opponent," if that might bring in "an enemy who could wage war on our population centers. . . . Military power can still be used directly, below the level of all-out war. . . . only if civilian leaders regard it as relevant and usable in specific conflict situations," and are confident that it "will be applied with appropriate precision and restraint."<sup>34</sup> This was 8 days after the Southeast Asia Resolution had empowered the President to "take all necessary measures to repel armed attack against the forces of the United States and to prevent further aggression,"<sup>35</sup> and 2 months before the fall of Nikita Khrushchev and a major rise in Russian defense spending.

The present dilemmas of American strategy stem partly from Vietnam and Russian and Chinese arms catch-ups, familiar phenomena in the industrial era. Others stem from containment's successes, the earlier reservation of nuclear weapons to the "Anglo-Saxons" in alliances which included three defeated aggressors and a prostrate France, and from specialization within that "vast spectrum of conflict," which the Basic Doctrine saw as "a fluid, integrated whole."<sup>36</sup> The need to harden missile sites has increased the need for megaton weapons. Multiple independent reentry vehicles may not be big or accurate enough for such targets and are better city smashers, and antiballistic missiles have not changed a numbers game which, in the overkill view, long since reached diminishing returns. To Jerome B. Wiesner "the lower limit to a deterrent . . . might be the force which could deliver six modern nuclear weapons on city targets. Even this number seems high to me, but if it is too low to you, make it twenty."<sup>37</sup> Quincy Wright sees an inherent contradiction in a system requiring "that the threat of a destructive second strike be sufficiently credible to assure that the threat of a first strike will be incredible," while "in quite probable circumstances"-as in the Cuban missile case-"a threat of a first strike may be credible and the threat of the second strike incredible."<sup>38</sup> Now that they have parity, the Russians may sign for it, but this will not get larger conventional forces from American great power allies who prefer strategic and tactical nuclear forces to trigger American support, nor will it stabilize the underdeveloped world.

Most Western studies of revolutionary warfare came after their military intellectuals had developed the complexities of limited response. While their Metaphors and Scenarios reached few underdeveloped marchers to different drummers, the major surveys of strategy by Marshal V. D. Sokolovsky's collective, Andre Beaufre, and Henry Eccles agreed with Bernard Brodie's 1959 *Strategy in the Missile Age* and Liddell Hart's *Deterrent or Defense*. By 1964 the technological revolution had made all-out war obsolete, had limited conventional war in Europe, and had "given capitalism a chance to use its control of much of the world's technological, transport, and capital resources to give states

dependent on access to these resources a stake in international economic growth and political stability." 39

But technology soon upset 1964's optimistic assumptions, and increased arms spending and- in MIRVs and ABMs partially nullifying the certainties obtained from intelligence satellites- nuclear uncertainties. Resource discoveries and substitutions decreased the need for and the prices of outside raw materials and bases. Military specialization, as has been noted, made peacetime strategy the political allocation of national and alliance resources to noncomplementary forces for deterrence, stabilization, and home defense in a North Atlantic alliance whose conventional force goals- as John C. Slessor had noted in his 1954 Strategy for the West 40- were obsolete and "unacceptable" to many Western Europeans and Canadians almost as soon as they were negotiated. And new wars of national liberation continued to make neo-colonial guidance systems less reliable than those for missiles, as the direct American costs of the Vietnam War ran over \$100 billion and Soviet military advisers saw their pupils blow \$2 billion of sophisticated equipment in 1 week against Israel in 1967.

If this picture of nuclear certainties and speculations, worldwide ideological commitments and economic strain for us and prosperous anomie for our great power allies, and militarism in developing countries and politicism in developed ones is confusing, it is analogous to those of other paradigm testing eras. This same confusion- except about all-out war- has helped in "Halting the Inflationary Spiral of Death." Levels of violence are below those of the last two generations. American containment paradoxically prevented all-out war until there was a real nuclear balance, without Westerners becoming totalitarian in the process. If the American Century is dying two generations after Europe's Proud Tower<sup>41</sup> began to crumble at the Marne, Western Europe and Japan have not gotten closer to George Orwell's fear that- after producing the war machines which almost destroyed them- they would turn to their equally well-tested social ones "not to extend but to diminish the range of thought"<sup>42</sup> of their overworked and undernourished citizens. And ideas of the effectiveness of The New Warfare in old revolutionary states whose ambitions, models, and fears have led them to defer consumption to invest in heavy industry and weapons may be moderating as their citizens find their continued sacrifices "unbearable, or unacceptable."

"Since the difficult problems of national policy," Kissinger wrote in 1957, "are in the area where political, economic, psychological, and military factors overlap, we should give up the fiction that there is such a thing as 'purely' military advice."<sup>43</sup> With everyone practicing the "art and science of developing and using political, economic, psychological, and military forces," however, soldiers have sometimes forgotten to check the terrain, and civilians were surprised by internal political reactions while they were playing soldier. The defense of the Vietnam war on strategical grounds- of base, raw materials, or manpower accretions- would have been difficult at best. But its high ideological and political content led its opponents to attack the whole political establishment rather than particular details of policy, such as the historically "proven" dangers of using conscripts in a limited war for the highly professional job of pacification. And American proposals to follow Canada and Britain in giving up conscription are seen in Germany as weakening the whole ideological and political purpose of NATO.

What has happened may be summed up as follows. In an era of rapid technological change which may now be bringing diminishing returns, Americans saw machine answers to many military questions, and, in the confident early 1960s, forgot some traditional maxims of strategic geography, economy of force, and simplicity in machine designing. Mao's successes in machine-countering led many national liberators to a similar overemphasis on morale and ideology and even, in Che Guevara's case, to underestimating Andean topography. The Russians were ideologically committed to machines and revolutions. The other great powers used the American nuclear umbrella. But if the events of the late 1960s have shown the limitations of some quick frozen paradigms, Kuhn's model suggests, as we have noted, that another new one will "incorporate much of the vocabulary and apparatus, both conceptual and manipulative, that the traditional paradigm had previously employed."<sup>44</sup> It is this new

synthesis which is the greatest intellectual challenge to this generation of professional soldiers, in spite of our condescending assumption that all military intellectuals are civilians, long after Clausewitz had remarked and many American soldiers had shown that "everywhere intelligence appears as an essential cooperative force and the work of war, plain and simple though it appears, can never be conducted with distinguished success without distinguished intellectual powers."<sup>45</sup> Or as Peter Paret puts it in a previous lecture in this series: "What the soldier of today must do is to step outside the very close circle of his duties and seek to understand what he and his country are involved in. Not only the techniques of your profession matter, but also their purposes," so long as, for some states and some conflicts of interest, "armed action may be the only method of resolution."<sup>46</sup>

1. The first phrase is from Leo Tolstói. Archibald S. Alexander, "The Cost of World Armaments," *Scientific American*, Vol.221, No.4 (Oct.1969), pp.24-26. This is one of several recent studies, all subject to challenge, but there is little doubt that arms spending rose sharply in the last half of the Development Decade.
2. Charles James, *A New and Enlarged Military Dictionary . . .* (London, 1802).
3. Carl von Clausewitz, *On War*; trans. O. J. Matthjis Jollis (New York, 1943), pp.251, 62.
4. Joint Chiefs of Staff, *Dictionary of United States Military Terms for Joint Usage* (Washington, 1962), p.205.
5. Department of the Air Force, *United States Air Force Basic Doctrine* (Washington, 1964), p.1-2.
6. Arthur Marwick, *Britain in the Century of Total War: War, Peace and Social Change 1900-1967* (Boston, 1968), p.369.
7. USAF Basic Doctrine, p.7-i. H.H. Arnold, "Air Force in the Atomic Age," in Dexter Masters and Katharine Way, eds., *One World or None: A Report to the Public on the Full Meaning of the Atomic Bomb* (New York, 1946), p.29.
8. Samuel P. Huntington, *The Soldier and the State: The Theory and Politics of Civil Military Relations* (1957, New York, 1964), p.465.
9. George F. Kennan, "Totalitarianism in the Modern World," in Carl J. Friedrich, ed., *Totalitarianism: Proceedings of a Conference Held at the American Academy of Arts and Sciences* (Cambridge, Mass., 1954), p.20.
10. Huntington, *Soldier and the State*, pp.143, 255. *The Statistical History of the United States from Colonial Times to the Present* (Stanford, Conn., 1966), pp.84, 736.
11. Ferdinand Foch, *The Principles of War*; trans., Hilaire Belloc (1903, London, 1921), p. 26.
12. Thomas S. Kuhn, *The Structure of Scientific Revolutions* (1962, Chicago, 1964), pp. 143-144, 109.
13. William H. McNeill, *The Rise of the West: A History of the Human Community* (Chicago, 1963), p.567.
14. Foch, quoting Clausewitz, *Principles of War*, p.43. A "doctrine or mental discipline" is "a common way of objectively approaching the subject . . [and] a common way of handling it," p. 18, or what Kuhn would call a common conceptual and manipulative" paradigm, *Scientific Revolutions*, p.148. The result of this "common way of seeing" is "a common way of acting" which should become "instinctive." Foch, p.13.
15. Alfred North Whitehead, *Science and the Modern World* (1925, New York, 1948), p. 36.
16. Foch, *Principles of War*; p.33. Jean de Bloch, *The Future of War in Its Technical, Economic, and Political Relations*, trans. R.C. Long (1899, Boston, 1903).
17. Alfred von Schlieffen, *Cannae* (1907, 1913, Ft. Leavenworth, Kans., 1931).

- 18 J. F. C. Fuller, *Machine Warfare* (London, 1943), p.35.
19. F. W. Lanchester, *Aircraft in Warfare* (New York, 1917).
20. Giuho Douhet, *The Command of the Air*, trans. D. Ferrari (1921-1930, London, 1943), pp.19, 116.
21. Clausewitz, *On War*, pp.583-584.
22. Herman Kahn, *On Thermonuclear Warfare* (Princeton, 1956); *Thinking about the Unthinkable* (New York, 1962); *On Escalation: Metaphors and Scenarios* (New York, 1965).
23. Melvin R. Laird, Speech to the National Press Club, Sep.25, 1969, *Navy Magazine* (Nov. 1969), p.33.
24. Mao Tse-tung, "Strategic Problems of China's Revolutionary War," in Anne Frematle, ed. *Mao Tse-tung, An Anthology of His Writings* (New York, 1962), pp.88-89.
25. Douglas MacArthur, quoted in Theodore Ropp, *War in the Modern World*, rev. ed (New York, 1962), p.403.
26. Arnold, "Air Force in the Atomic Age," pp.26, 32.
27. C. N. Barclay, *The New Warfare* (New York, 1954), p.18.
28. Henry A. Kissinger, *Nuclear Weapons and Foreign Policy* (1957, abr. ed., New York, 1958), pp.245-246, 168, 233.
29. *Ibid.*, pp.165, 190-191.
30. Bertrand de Jouvenel, *The Art of Conjecture*, trans. Nikita Lary (London, 1967), p. 161. Weapons designs and the increasingly popular 10- to 20-year forecasts are mid-range predictions subject to "rapid impoverishment as the term of the forecast recedes into the future . . . and empirical relations based on a recent past are deformed," p.204.
31. Clausewitz, *On War* p.6.
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