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IMAGINATIONS IN THRALL: THE SOCIAL PSYCHOLOGY OF MILITARY MECHANIZATION

1919-1939

by

BARTON C. HACKER

Almost everyone knew that tanks would play a large part in the next war. Cambrai, Amiens, and a host of other actions during 1917 and 1918 had shown that. The real question was what part. Would future tanks merely be, as most opponents of mechanization believed, a "powerful auxiliary to infantry and cavalry"? That was largely what tanks had been in the World War. It was also, until well into the 1930s, what all the world's major armies expected them to be in any war to come: a company of tanks to stiffen the battalion of foot, a tank battalion to augment the power of the infantry division much as its artillery did.² Critics of mechanization freely granted tanks a part in future war, but never the leading part.

Advocates of mechanization beheld a grander vision. They knew that the slow, thin-skinned, short-ranged, unreliable tanks of the Great War could do little more than add weight to the infantry assault.³ But they dreamed of a larger role for what tanks might become—swift and potent machines to restore maneuver to the battlefield and forestall the return of trench warfare. They urged adoption of

the tank as the principal fighting arm, to which the infantry and the other arms will form auxiliaries as required, instead of making the tank as heretofore, an auxiliary of the infantry arm.⁴

Armored divisions, even tank armies, not mere companies or battalions, were the proper goal. Armor might supplant infantry as the heart of armies. This vision inspired the doctrine of armored, or mechanized, warfare and provoked a controversy that lasted two decades and more.

The doctrine arose and first flourished in the British Army. Its founder was J. F. C. Fuller, whose persuasive advocacy of the new idea during the World War and after rallied a remarkable band of supporters to the cause.⁵ Fuller and his disciples, first among them B. H. Liddell Hart, argued the case for mechanization with immense skill, not only to their fellows but also before the bar of history. The story of mechanization has largely been told by its sponsors and their converts, both in Great Britain, its homeland, and abroad.⁶ Their case seems all the more ironclad today, for what they foretold came to pass. Armor did rule the battlefields of World War II, and large-scale trench warfare did not recur.⁷

Yet the record of controversy remains. Much of the argument was reasoned and thoughtful, and both sides addressed real issues—specific technical, tactical, and operational questions related to the military use of tanks and tank forces.⁸ But there was more to the story. It was no simple matter of summing the pluses and minuses, then reading off the logical result. Tanks meant something more than technological progress

to the officers who argued about how they should be used. Emotion, even passion, colored the debate. It may also have in some ways shaped the political-military judgments that decided national policies toward mechanization. These symbolic and psychological aspects of the case are the subject of this essay.

I am here concerned more with the spirit of the controversy than its substance, although the substance was unquestionably important and the two can seldom be sharply divided.⁹ The task is no easy one. We may scarcely expect to find in half-century-old professional military journals forthright comments on, for example, an officer's emotional response to tanks. What we do find is a spectrum of recurrent themes, allusions, and unexpected turns of phrase. What we find, in short, is latent content among the overt concerns of advocates and opponents of mechanization. There was implied as well as explicit meaning in what they wrote, and that hidden meaning can also be read.¹⁰

I

The men who joined the new Tank Corps during the World War were attracted by what one of them described as

an iron monster, breathing fire and exhaling bullets and shells, hurling itself against the enemy, unassailable by man and impervious to the most deadly engines of war; sublime, indeed, in its expression of indomitable power and resolution. . . . Above all, the new monster had our imaginations in thrall.¹¹

Statements encompassing both power and terror reflected the ambivalence of men who found the new machines at once exciting and frightening:

There was something inexorable and inhumanly purposeful about them. Whatever may be the feelings of the men inside the machine, the machine itself is horribly expressionless.¹²

The source of terror was precisely this blank visage,

the absence of any visible human agency. The crew were unseen: Invicta seemed to deal death of its own volition. . . . War is always frightful, but in mechanical warfare there is an added terror arising from the inherent insensibility of the machine.¹³

Filmmakers, we may note, have exploited this perception: blank, faceless, inexorable, tanks have often served as a ready symbol for the impersonal horror of modern war.¹⁴

But if terrible to the foe, tanks were havens on the battlefield for their friends:

A tank crew is spared most of the horrors of the battle-field. They do not see or hear their stricken comrades; they do not see or hear the bursting shells, than which there is nothing more nerve-wracking.¹⁵

Not only did the crew members' "steel walls [give] them a sense of security, [but] their faith in their machines inspired them with great confidence."¹⁶ This union of outward aggression and inward security was unique to the tank. Perhaps more than anything else, it created the psychic resonance that echoed and

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re-echoed in the thinking that revolutionized the theory and practice of war between 1919 and 1939. The union of mobile hitting power *and* protection was the constantly reiterated theme of the case for mechanization:

With tanks, the soldier has the ideal and long-sought combination of fire and movement, with a speed across country that will exceed that of cavalry, and a degree of protection formerly undreamed of.¹⁷

The first modern tank was the British Vickers Medium, which entered service in 1923. In what was essentially a single step, the slow-moving siege machine of the World War was transformed into a swift instrument of maneuver.¹⁸ From the beginning, however, advocates of mechanization stressed the importance of what tanks might become, not what they were. Their common view was that “present tanks are but embryos, and none can say what forms the monstrous brood may take.”¹⁹ They rarely denied “that the tank as existing at present has its definite limitations,” but they also insisted that “limitations weighing on the older arms” could only grow more severe as time passed and weapons improved, “whereas mechanical warfare has within itself potentialities of which we have as yet only touched the fringe.”²⁰

There was a sense of power in using tanks, compounded of controlling great strength and exercising a wide-ranging independence.²¹ And, too, there was a sense of exhilaration in careening cross country in a fast modern tank, once such tanks became available. Such machines displayed a potential that seemed to one infantry officer, after his first ride, the very incarnation of “a childhood dream, often repeated, of possessing the power of a giant with the added capability of swift and effortless movement.”²²

The art of war had vanished in the Great War’s “squalid trench labyrinths,”²³ its “nightmare [of] colossal casualty lists.”²⁴ Armies “gripped as by a vise by the machine gun, barbed wire, and the spade”²⁵ were paralyzed by “the power of defence and the

impotence of the attack.”²⁶ To revive the lost art of war was “the whole object and hope of mechanization in the army.”²⁷ With a tool like the tank force at hand, the officer might cease to be an impotent bystander and regain his power to direct and control the course of events. The tank,

like the rapier wielded by those heroes of our boyhood’s storybooks, . . . can strike the enemy’s body where we will and, as it were, in the twinkling of an eye.²⁸

Now might “speed both of mind and movement [become] dominant.”²⁹ The familiar war of stable fronts and well-aligned troops would become a war of areas, “of sudden and unexpected operation,”³⁰ of “battles almost uncontrollably fluid,”³¹ of “the very greatest rapidity,”³² of “great distances and . . . exceedingly long range,”³³ of front lines indistinguishable from rear areas.³⁴ “Trench warfare deliberation”³⁵—the massing of reserves and supplies, the endless pounding of the guns, “the more than religious importance attached to holding ground”³⁶—would give way to

fast and deep penetration . . . wide and rapid flanking movements . . . fronts and flanks anywhere . . . in fact, conditions of area fighting instead of the linear battle-front operations of the flesh-and-blood armies of the past.³⁷

An air of confidence and faith in the future pervaded the case for mechanization. The prospect of battles without boundaries, of open and wide-ranging movement, of an army “more independent and free . . . , more mobile, light-hearted and buccaneering”³⁸—the prospect, in short, of armored warfare—advocates of mechanization greeted as the promise of

war . . . again become more of an art and less of a business. Surprise will be restored to its former position of importance, and we may hope to see again brilliant manoeuvres and decisive battles reminiscent of Marlborough and Napoleon.³⁹

They feared that "commanders accustomed to handling ordinary formations of infantry, cavalry and artillery would be likely to go badly astray under such super-charged conditions,"⁴⁰ that the traditional combat arms had themselves become "an anachronism and a brake on the wheel of progress."⁴¹ The shape of the 20th century mirrored the internal combustion engine. By "altering the whole pace and range of civil life [that one advance made] the mechanization of armies . . . inevitable."⁴² Mechanization could "rejuvenate the army"⁴³ by drawing upon "a younger generation . . . , bred up with mechanized vehicles, who will be imbued with mobility of thought and action."⁴⁴

In a lecture before the Royal Artillery Institution at Woolwich in 1924, a lieutenant colonel of tanks spelled out the challenge both to senior officers and to the older arms. He first addressed the junior officers in his audience:

It is you I am trying to interest to-day. It is your weapon I am going to discuss. The senior officers may talk a lot about it, but in the great day the subalterns of 1924 will be handling it or destroying it. *The Tank is the Youth of the Army.*

He then turned to the senior arms:

You, the older services, are our betters. We have all the faults of youth and those faults may at times annoy you. We are inclined to be above ourselves, to make tremendous claims for our arm which you, our betters, may not allow. All restrictions are irksome and sometimes we resent being hemmed in by precedent. But we have youth's greatest asset, we are enthusiasts. We believe we have a weapon that properly handled will so quicken up war as to revolutionize it.⁴⁵

To argue, as so many critics of mechanization did, that this or that tank was lacking, that one or another experimental unit displayed weaknesses, that the last word in technical development had yet to be uttered, all meant little to the case for mechanization. Its advocates themselves

mentioned the faults of tanks more often than their virtues. What mattered was the idea of a new kind of war, not the machine that might promote it. The tank could be faulted, even dismissed as worthless, without compromising the principle.⁴⁶ It was merely the tool. Mechanization was less a blueprint than a prospectus. Perhaps more than anything else it was a new military gospel. When the British Army issued the first official manual on mechanized war in 1929, Fuller welcomed it as the gospel made manifest:

Today in the British Army we have a new tactical testament, because we are the believers in a new military gospel, and it is the gospel which has created the book—the belief of the soldier in the newest arms which science and industry have rendered possible.⁴⁷

To many advocates of mechanization, science applied to war was the key. What to do with new weapons, how to use them effectively, had become acute problems since the mid-19th century as a "surge of miraculous invention"⁴⁸ transformed the society of which armies were a part and altered "very deeply the character of war."⁴⁹ Swept by a swelling flood of new and improved weapons, the ever-shifting technical foundations of military operations had for decades thwarted the best efforts of army planners. And since the World War "the pace of scientific and mechanical progress [had] been revolutionized, not merely accelerated."⁵⁰ But now modern technology permitted the design of new machines to meet military demands; engineers could provide the machines that tactics required. Fuller sounded the keynote of the new age at its dawn: "There is nothing too wonderful for science—we of the fighting services must grasp the wand of this magician and compel the future to obey us."⁵¹

II

Critics disdained the magician's wand. They saw no need for it or its products. Armored warfare appeared to them nothing

but an untested theory supported by neither wartime experience nor peacetime experiment. They dismissed the claim that tanks had decided the World War—calling them at best “only aids to victory,”⁵² at worst “a freak [of] exceptional [conditions] not likely to recur.”⁵³ Tanks may have done well enough to allow them a place in future war, but no more than that. Peacetime army maneuvers were equally suspect. Conducted in country so ideal for tanks, under circumstances so remote from real war, their lessons could only be “equivocal,”⁵⁴ “unreliable,”⁵⁵ or “false.”⁵⁶ The critics may have been right. Advocates of mechanization, too, sometimes questioned the results.⁵⁷ But since maneuvers tended to show armored forces in a better light than the older arms, critics more often than advocates found the results misleading.

Until tank forces proved themselves in a new war their supposed value must remain doubtful. But the lessons of new wars proved no less ambiguous:

If . . . a third-rate ‘man-power’ army, such as the Abyssinian, can impose a delay of many months on a mechanized opponent, what is going to happen when the modern army meets its like? Perhaps we had better wait and see.⁵⁸

They waited, and what they saw was tanks useless in the Chaco War between Paraguay and Bolivia,⁵⁹ an Italian mechanized column routed at Guadalajara in the Spanish Civil War,⁶⁰ a lucky German triumph in Poland which proved nothing.⁶¹ They saw, in other words, what they expected, just as did advocates of mechanization who dismissed the mishaps of mechanized forces in Ethiopia and Spain as evidence only of faulty machines poorly handled.⁶²

A striking, if not altogether surprising, feature of the mechanization controversy was the failure of the two sides to talk to each other. The one often overlooked, ignored, or mistook the arguments of the other, less likely to address a rival than rehearse the settled conclusions of a friend. This failure of

each to confront the other was nowhere more glaring than when the dispute turned to the costs of mechanization. On its face, the economics of the case should have been a matter of objective fact, however complex in detail. Yet when its sponsors called mechanization economical and its critics judged it too costly, they were not talking about the same thing at all.

Advocates of mechanization saw men as “the expensive item” in an army,⁶³ and mechanization promised to reduce the need for men. The concentrated firepower of a tank brigade exceeded that of an infantry division and was wielded by far fewer troops.⁶⁴ That made the armored force “cheaper per unit of fighting power than one composed only of human and animal elements.”⁶⁵ And the savings did not end there. Mechanization meant “quicker and more decisive results, and therefore in the end less expenditure of life.”⁶⁶ Fewer men on the field of battle, and those protected by armor, meant fewer lives lost. This was the real economy of mechanization. Machines rather than men might pay the cost of future war.

But to its critics the economics of mechanization began with the price of tanks, and that price was too high. No nation in peacetime “could sanction the capital expenditure required to provide the necessary tanks”⁶⁷ or the “indirect heavy capital outlay” for needed support facilities.⁶⁸ Yet there was more, the “heavy and proportionately increasing cost of maintenance and replacement.”⁶⁹ A mechanized army would have to be refitted every few years, lest it find itself at war with “a vast quantity of what may prove to be not only useless and obsolete machines, but literal deathtraps.”⁷⁰ Adding the expense of keeping a mechanized army up-to-date to the cost of building it in the first place pushed the price too high for its critics, the more so since they saw no reason to pay.

They disliked tanks—these “mechanized or armour-plated novelties,”⁷¹ offending the ear with “roar and clatter,”⁷² the nose with a foul “savour of carbon-monoxide”⁷³—but that was only the beginning. They were both disquieted by tanks and disturbed by the

claims of advocates. The case against mechanization attacked its advocates as much as the doctrine itself. Critics denounced them as purveyors of "quack remedies"⁷⁴ or "prophets who make extravagant claims."⁷⁵ They warned against the "mad outpourings [of] enthusiasts for mechanization,"⁷⁶ and the "revolutionary military thought [and] strong communistic tendencies [of] extremists."⁷⁷ Critics of mechanization were far more apt than advocates to charge their rivals with incompetence, base motives, or fanaticism, a sign of how deep the issue cut, how basic the beliefs that were threatened.⁷⁸

Some who opposed mechanization were more restrained, stressing the virtues of careful progress over the dangers of reckless enthusiasm. "It is only by trial and error that safe progress can be achieved," they cautioned, even though to many "the progress made may have seemed slow and the results disappointing."⁷⁹ But vilification and procrastination were two sides of one coin. The same writer who decried "fanatical enthusiasts" praised as "infinitely [sound] the system of gradual change after exhaustive experiment."⁸⁰ Both name-calling and excessive prudence mirrored fear of mechanization and what it might bring.

The shifting, fluid, and rapid war of area rather than line forecast by advocates of mechanization seemed a chancy and unsure kind of war to its critics. Battles, they believed, were won "by hard thinking, hard fighting and hard work,"⁸¹ not by "moving about the battle-field in the hope of out-flanking the enemy."⁸² Tanks were "intrusive machines"⁸³ that "usurped" the rightful place of men on the field of battle.⁸⁴ The "basic principles of war [were] immutable"⁸⁵ and always favored "the man fighting on his own feet" over any machine, however powerful.⁸⁶ "In the end it always comes to the push of the pike . . . by hand of man."⁸⁷ Tanks threatened to replace the proper war of clearly separated armies moving step by step from one sharply defined place to another, with a reckless and unrestrained plunge into the unknown, with "eccentrically moving armies, adrift from their anchorages."⁸⁸

The pronounced stress critics placed on

the vulnerability of tanks and tank forces underscored these feelings. Tanks themselves were "terribly vulnerable things" that had to keep moving or be destroyed.⁸⁹ As one infantry officer warned,

History demonstrates that armour has never yet defeated the weapon; and inevitably, sooner or later, an efficient anti-tank gun will be produced: this will have much the same effect in immobilizing the tank as the machine gun has had against infantry, although the resultant loss in fighting power will be more extensive and more difficult to make good.⁹⁰

Supply presented immense problems. "Man and horse can live on half rations, but a carburetor must always be full."⁹¹ Critics foresaw a mechanized "army infinitely more sensitive in its vulnerable tail than the armies of the flesh and blood type of the pre-motor periods."⁹² It would find "the protection of [its] 'lifeblood' arteries [its] most absorbing anxiety; since an obstruction might, at any moment, mean an irretrievable disaster."⁹³ Even the assault of massed tanks could prove a rash venture against a cool defense that first yielded before the "penetrative" force, then gathered at

the lips of the salient to pinch it out. [Finally,] counter-attacked from one or two flanks, [the tanks] must, if the counter-attack is properly constructed, be pinched out, isolated and annihilated.⁹⁴

Thus might the army that relied too greatly upon tank forces be shorn of its power and reduced to impotence.

To some it seemed "quite within the bounds of possibility that [further technical developments] will make tanks useless as weapons of attack"⁹⁵ or "so disorganize an army designed with the tank as keystone that victory through the action of the longer established arms will be facilitated."⁹⁶ The prospect did not displease them. Opponents of mechanization in every country would surely have found much to commend in the views a retired American cavalry general

addressed to the editor of the *Cavalry Journal*:

We should employ our wits not so much in the invention of proper use of mechanized warfare devices as on the best way of destroying these engines of war. . . . Let us use a little American inventiveness, and machines will be as useless in war as the German submarines and Zeppelins had become in 1918.⁹⁷

III

Having shown how the rival sides in the mechanization controversy sometimes expressed themselves in slightly unusual or unexpected terms, I would now suggest that these seeming anomalies were not merely idiosyncratic or accidental. Instead, they form a consistent pattern. Tanks were thrilling, and they were frightful. Indeed, they were sexy and violent. The juxtaposition of sex and violence throughout the dialog characterizes what one writer terms the "masculine mystique," perhaps epitomized in the image of the warrior.⁹⁸ Armed combat, as a Yale social scientist once observed, has been "the business of one sex," a fact reflected in and reinforced by the uncompromising masculinity of weapons.⁹⁹ That weapons may serve as sexual symbols is a commonplace of psychoanalytic theory and a cliché of vulgar Freudianism.¹⁰⁰ Like spears, swords, arrows, or guns, tanks displayed or connoted such typically masculine attributes as hardness, power, mobility, and projection.

But tanks did more. They also incorporated protective, enclosing, and securely womb-like feminine attributes, something unprecedented in modern weapons for land warfare. What made tanks unique was an amalgam of disparate masculine and feminine traits. They were, if you will, androgynous, with all the ambiguously positive and negative meanings that term implies.¹⁰¹ Such equivocal traits provoked uniquely ambivalent reactions. For some men, this may have been the source of creative tension that produced a new vision of warfare. A

degree of psychological femininity is one of the traits that divide the creative men in a field from their more routine-bound colleagues. Others include a tolerance for ambiguity, a readiness to discard rules that no longer work, a willingness to persist in the face of criticism. All characterized the leading advocates of mechanization.¹⁰²

Ambiguity and ambivalence, however, can also be disturbing. Although advocate and critic alike seemed fascinated by tanks, the results were very different. The same ambiguity—both of the machines and the battlefields they promised to create—that inspired advocates threatened critics. Where advocates of mechanization saw the promise of power, freedom, and a rebirth of the art of war in tanks rightly used, critics saw fragile machines, vulnerable armies, and looming disaster. Anxiety may explain the imagery of castration and impotence so striking in the case against mechanization.

The whole tenor of the arguments both for and against mechanization confirms that a good deal more was at stake for the proponents of each side than merely how tanks should be used in a future war. On one side were ranged junior officers and officers in the army's newer technical branches.¹⁰³ They urged, even demanded, change to meet the crisis of modern war and to align the army "with the trend of civil life and modern scientific thought."¹⁰⁴ They called themselves "prophets"¹⁰⁵ and preached the gospel of a new way in war, of

a new model army, an army of educated men, of formidable weapons and of astonishing movement, an army led by scientists and fought by mechanics—a true machine of war.¹⁰⁶

On the other side were senior and retired officers, and officers in the older combat arms, claiming that nothing had changed, or should. They saw themselves epitomized in the "sound, commonsense Englishman"¹⁰⁷ concerned with "practical problems and possibilities, [not] the misty . . . future."¹⁰⁸ The tank was just a machine, useful in some ways, useless in others:

Let us make full use of our new servant, but do not let us put upon it burdens which are too great for it to bear and which, by its fundamental character, it is not qualified to carry.¹⁰⁹

The tank and its limitations furnished the substance of the case against mechanization, but its threat to the established order instilled the spirit.

By and large, the advocates of mechanization seemed to have the better of it in the major military journals. Not only were there twice as many articles for as against mechanization, but the pro-mechanization articles also seem, on the whole, to have been better written. In contrast to the assured and forceful case for mechanization, the counterargument often seems strained and disjointed, even shrill.¹¹⁰ Yet all this may really have mattered little. Costly, untried, and full of implications for the very structure of military institutions, mechanization held small appeal for the senior officers whose opinions mattered, however they may have reacted to its latent meaning.

There was, of course, a great deal more than impassioned reactions to tanks in the story of mechanization during the 1920s and 1930s, but this underlying conflict may have done more than a little to shape the development of a tactical doctrine of armored warfare. It may also help to explain the ultimate fate of mechanization as a military policy.

Although the doctrine had seemed to flourish in the British Army during the 1920s, appearances were misleading. The early British lead was lost, and J. F. C. Fuller, the foremost advocate of mechanization, was himself forced from active service. By the mid-1930s the initiative had passed to the German Army. The major architect of German mechanization, Heinz Guderian, freely admitted his intellectual debt to the British theorists. But the German Army, unlike the British, procured tanks in large numbers, and Guderian himself organized, trained, and directed its tank forces. These developments stemmed from political decisions, not military. Senior German of-

ficers no more endorsed such a policy than their British counterparts. In a postwar interview, General Ritter Wilhelm von Thoma, one of Rommel's subordinate commanders in North Africa, recalled the "resistance from the higher generals of the German Army" to the creation of armored forces. They

did not understand the technique of armored warfare, and were uncomfortable with such new instruments. We could have gone ahead much faster but for their attitude.¹¹¹

The difference was the degree of support at the highest levels of government. German advocates of mechanization had the inestimable advantage of a chief of state who himself became a tank enthusiast. Hitler saw immediately what armored forces could mean for a rebuilt German Army. "That's what I need!" he exclaimed at his first review of armored units after becoming Chancellor. "That's what I want to have!"¹¹² This may not have been quite the instant conversion it seemed, however. In *Mein Kampf* a decade earlier he had noticed "the general motorization of the world, which in the next war will manifest itself overwhelmingly and decisively."¹¹³ Whatever the timing, there may well have been some subtle meshing of the image of mechanized war with the mental set of the authoritarian leader. Hitler was not alone in succumbing to the spell of tanks. Mussolini's Italy and Stalin's Russia were also eager adopters of the new instruments of war.¹¹⁴

Fuller himself, in fact, made the linkage quite explicit, and acted upon it by joining the British Union of Fascists after he was forced from the army in 1933. His personal brand of fascism was idiosyncratic—he called it synthetic-iconoclasm—but it grew from the same reasoning that had generated the doctrine of armored warfare.¹¹⁵ Just as a scientific machine age demanded mechanization because the warfare of mass man was obsolete, so such an age demanded fascism because the politics of mass man, democracy, was outmoded.¹¹⁶ A then little-known French officer, Charles de Gaulle, won himself a

name as an advocate of mechanization when he published his call for the salvation of France through an elite professional army and elite political leadership.¹¹⁷ Not every advocate of mechanization shared such views; perhaps not very many did. But the case for mechanization did echo some of the basic themes of modern authoritarianism.

For the military advocates of mechanization, the core idea was the union of gun and armor in fast-moving machines which might return to battle its power to decide. Armored forces could revive the lost potency of armies and renew their capacity for decisive action. As one young officer expressed it,

Science has reduced warfare to a grim and dreadful business about which the world retains few illusions of romance and glamour; but she may yet restore to battle something of its lost Homeric savour in the tank combats of the future.¹¹⁸

And so in some ways it did, once the political decision to create tank forces had been effected.

Key to the political vision of mechanization was its symbolization of power, menace, and impersonal terror. Terror, Fuller asserted in 1936, might well decide the next war.¹¹⁹ Policy, like doctrine, may involve passion as well as reason, and the one need not exclude the other. A mechanized army appealed to Hitler, one of his most thoughtful biographers suggests, because

it gave the impression that the German military machine was more than life-size, that it possessed some virtue of invincibility against which ordinary men could not defend themselves.¹²⁰

In its mechanized army, Nazi Germany realized one of the earliest dreams of fascism, the triumph of machine-augmented masculine power over all that is weak, soft, and effeminate.¹²¹ If mechanization needed the new political order to move from theory to practice, fascism also required the new military order to achieve its goals. As one

British officer noted with some unease in 1938, "Only a madman would launch a nation into war without a better recipe for victory than that which willy-nilly had to serve in 1914-1918."¹²² Fascism meant war, and mechanization promised a way to make war victorious.

Innovations are seldom measured only by utility. Such issues as cost and efficiency may, of course, be decisive, but motives for accepting or rejecting change are often mixed.¹²³ In the case of mechanization, tanks and tank forces may have assumed a certain symbolic significance, and the psychology of mechanization, in turn, may have helped shape both doctrine and policy. This is not to say that symbol and psyche were the sole, or even the chief, determinants of the fate of mechanization. But if not all-important, they still weighted the outcome.

At the very least, recognizing the psychological resonances of an innovation like mechanization may aid us to understand, in part, why some men were willing to stake their careers, indeed in a real sense their lives, on its implementation, while others perceived an all-destructive threat to be resisted at all costs. Such an understanding may not be of purely antiquarian interest. The military imagination of the past half century seems increasingly to have been captured by complex and fascinating weapon systems. Perhaps the tank was a harbinger of the future in more ways than even its most ardent advocates dreamed.

NOTES

1. G. F. Brooke, "Aut cursu, aut cominus armis," *Army Quarterly*, 15 (January 1928), 261. *Army Quarterly* hereafter referred to as *AQ*.
2. Richard M. Ogorkiewicz, *Armoured Forces: A History of Armoured Forces and Their Vehicles*, 2d ed. (New York: Arco, 1970); Charles Messenger, *The Blitzkrieg Story* (New York: Scribner's, 1976), pp. 33-141.
3. The best account of the invention and use of tanks in World War I is B. H. Liddell Hart, *The Tanks: The History of the Royal Tank Regiment and Its Predecessors . . .* (London: Cassell, 1959), I, 17-195. For technical details and glimpses of the machines themselves, see also B. T. White, *Tanks; and Other Armoured Fighting Vehicles, 1900-1918* (New York: Macmillan, 1970); and Duncan Crow, ed., *Armoured Fighting Vehicles of the World, Vol. I: Armoured Fighting Vehicles of World War I* (Windsor, England: Profile, 1969).

4. A. P. Wavell, "The Army and the Prophets," *Journal of the Royal United Service Institution*, 75 (November 1930), 668. *Journal of the Royal United Service Institution* hereafter referred to as *JRUSI*.

5. See especially J. F. C. Fuller, *Memoirs of an Unconventional Soldier* (London: Ivor Nicholson and Watson, 1936); B. H. Liddell Hart, *Memoirs* (London: Cassell, 1959); and G. le Q. Martel, *In the Wake of the Tank: The First Eighteen Years of Mechanization in the British Army*, 2d ed. (London: Sifton, Praed, 1935). Fuller and Liddell Hart are each the subject of a perceptive essay by Jay Luvaas in his book *The Education of an Army: British Military Thought, 1815-1940* (Chicago: Univ. of Chicago Press, 1962), pp. 335-424, and of recent biographies: Anthony John Trythall, "Boney" Fuller: Soldier, Strategist, and Writer, 1878-1966 (New Brunswick, N.J.: Rutgers Univ. Press, 1977); and Brian Bond, *Liddell Hart: A Study of His Military Thought* (New Brunswick, N.J.: Rutgers Univ. Press, 1977).

6. The best history of British mechanization was written by one of its foremost advocates: Liddell Hart, *The Tanks*, I, 199-404. See also Walter H. Butler, "A Case in Preparedness," *Armor*, 60 (November-December 1951), 30-36; Robin Higham, *The Military Intellectuals in Britain: 1918-1939* (New Brunswick, N.J.: Rutgers Univ. Press, 1966), pp. 67-116; David Divine, *The Blunted Sword* (London: Hutchinson, 1964), pp. 144-61; Frederick Pile, "Liddell Hart and the British Army, 1919-1939," in *The Theory and Practice of War: Essays Presented to Captain B. H. Liddell Hart on His Seventieth Birthday*, ed. Michael Howard (New York: Praeger, 1967), pp. 167-83; John Wheldon, *Machine Age Armies* (London: Abelard-Schuman, 1968), pp. 29-55; Ogorkiewicz, 55-63, *et passim*; Kenneth Macksey, *Tank Warfare: A History of Tanks in Battle* (New York: Stein and Day, 1971), pp. 70-94; and Messenger, pp. 39-52, 74-85. On British tank development, see also Crow, Vol. II: *British AFVs 1919-1940* (Windsor, England: Profile, 1970); S. Capel Peck, "The Early Days of Mechanization," *JRUSI*, 91 (August 1946), 387-95; and J. D. Scott, *Vickers: A History* (London: Weidenfeld and Nicholson, 1962).

7. The second volume of Liddell Hart, *The Tanks*, covers World War II; see also Eddy Bauer, *La guerre des blindés: les opérations de la Deuxième Guerre Mondiale sur les fronts d'Europe et d'Afrique*, 2d ed., 2 vols. (Paris: Payot, 1962).

8. See especially Barton C. Hacker, "Resistance to Innovation: The British Army and the Case against Mechanization, 1919-1939," *Proceedings of XIIIth International Congress of the History of Science, Moscow 1971*, Sec. II: *The History of the Organization of Scientific Researches* (Moscow: Editions "Naouka," 1974), pp. 225-31.

9. My understanding of the controversy derives chiefly from a systematic content analysis of all articles on tanks and mechanization published from 1919 through 1939 in the two major British military journals, *AQ* and *JRUSI*. For a complete account of the rationale, methods, and results, see Barton C. Hacker, "The Military and the Machine: An Analysis of the Controversy over Mechanization in the British Army, 1919-1939" (Ph.D. dissertation, Univ. of Chicago, 1968). Although formal analysis was limited to the two British journals, I studied several other British and American journals in detail, sampled the Continental literature, and read a number of contemporary books. Nothing suggests that the basic structure of the controversy anywhere differed significantly from the British.

10. Robert F. Swierenga, ed., *Quantification in American History: Theory and Research* (New York: Atheneum, 1970), pp. 78-95.

11. Richard Haigh, *Life in a Tank* (Boston and New York: Houghton Mifflin, 1918), pp. 1, 5.

12. J. Burnett-Stuart, "The Progress of Mechanization," *AQ*, 16 (April 1928), 50.

13. G. Murray Wilson, ed., *Fighting Tanks: An Account of the Royal Tank Corps in Action, 1916-1919* (London: Seeley, Service, 1929), p. 158.

14. Two striking examples are Robert Aldrich's 1957 film, *Attack!*, which pits American foot soldiers against German panzers; and Bernhard Wicki's *The Bridge* (1959), which confronts German schoolboys with American tanks. See Tom Perlmutter, *War Movies* (London: Castle, 1974), pp. 55, 118.

15. W. D. Croft, "The Influence of Tanks upon Tactics," *JRUSI*, 67 (February 1922), 44.

16. F. Mitchell, *Tank Warfare: The Story of the Tanks in the Great War* (London: T. Nelson and Sons, 1933), p. 289.

17. R. Chenevix Trench, "Gold Medal (Military) Prize Essay for 1922," *JRUSI*, 68 (May 1923), 201.

18. Liddell Hart, *The Tanks*, I, 220; Peck, pp. 387, 389-90; N. W. Duncan, "Mediums Marks I-III," in Crow, II, 1-20.

19. Trench, p. 210.

20. E. W. Sheppard, "Seeing Ahead," *AQ*, 29 (October 1934), 111.

21. Charles G. Mettler, "The British Armoured Forces: What of Our Position as to This New Kind of Warfare?" *Army Ordnance*, 10 (July-August 1929), 9.

22. Cary L. Crockett, "Five Days at Fort Knox," *Cavalry Journal*, 46 (November-December 1937), 527.

23. B. H. Liddell Hart, "The Development of the 'New Model' Army: Suggestions on a Progressive but Gradual Mechanicalization," *AQ*, 9 (October 1924), 50.

24. G. le Q. Martel, "Mechanization," *JRUSI*, 82 (May 1937), 281-82.

25. J. C. Slessor, "Gold Medal Essay (Military), 1936," *JRUSI*, 82 (August 1937), 475.

26. J. K. Edwards, "The Functions of Tanks," *JRUSI*, 80 (February 1935), 104.

27. Martel, "Mechanization," p. 282.

28. Frederick Pile, "The Development and Future of Armoured Fighting Vehicles," *JRUSI*, 76 (May 1931), 391.

29. Liddell Hart, "Development," p. 49.

30. H. Rowan-Robinson, "The Defensive and Outpost Positions in Modern Warfare among Civilized Nations," *AQ*, 13 (January 1927), 321.

31. Lionel Dimmock, "The Problem of the Tank," *AQ*, 8 (July 1924), 377.

32. "The Mechanicalised Division of the French Army," *JRUSI*, 70 (February 1925), 98.

33. Pile, p. 379.

34. J. F. C. Fuller, "One Hundred Problems on Mechanization," *AQ*, 19 (October 1929), 16-17.

35. B. H. Liddell Hart, "The Army Exercises of 1930," *JRUSI*, 75 (November 1930), 686.

36. Slessor, p. 470.

37. G. C. Shaw, "Supply and Transportation," *JRUSI*, 78 (November 1933), 808.

38. W. E. Maitland-Dougall, "Elijah and the Ravens," *AQ*, 35 (October 1937), 51.

39. R. Hilton, "Fire Power or Armour," *JRUSI*, 73 (February 1928), 66.

40. B. H. Liddell Hart, "Mind and Machine, Part II.—Tank Brigade Training, 1932," *AQ*, 26 (April 1933), p. 54.

41. H. Rowan-Robinson, "The Reformation of Infantry," *JRUSI*, 78 (August 1933), 514.

42. Wavell, "Army and Prophets," pp. 669-70.

43. "Air and Land Warfare: An Examination of the

Reasons for Divergence of Opinions between the Army and the Royal Air Force," *AQ*, 10 (July 1925), 286.

44. Liddell Hart, "Army Exercises," p. 686.
45. F. A. Pile, "The Problem of the Tank," *Journal of the Royal Artillery*, 52 (July 1925), 217 (emphasis in original).
46. Hilton, "Fire Power," pp. 61-66; L. V. Stewart Blacker, "Mechanized Warfare in Asia," *JRUSI*, 74 (February 1929), 17-26; and M. T. C. Gompertz, "The Application of Science to Indian Frontier Warfare," *AQ*, 10 (April 1925), 122-33. Similarly, rejecting mechanization did not necessarily mean rejecting tanks; H. J. Cooper, "Transport and Tactics," *JRUSI*, 72 (May 1927), 327-38; C. P. Deedes, "The Influence of Ground on Modern Military Operations," *JRUSI*, 74 (February 1929), 38-45, and "The Tank War of 1946," *JRUSI*, 75 (May 1930), 310-13. On the importance of the distinction between mechanization and using tanks, see Hacker, "Military and the Machine," pp. 19-23.
47. J. F. C. Fuller, "Mechanization and Realization: Emphasizing the Three Main Factors of Tank Specification," *Army Ordnance*, 10 (September-October 1929), 90-91.
48. L. Browning, "I Believe," *AQ*, 37 (October 1938), 69.
49. D. C. Cameron, "The Supply of Mechanized Forces in the Field," *JRUSI*, 74 (November 1929), 750.
50. Liddell Hart, "Army Exercises," p. 688.
51. J. F. C. Fuller, "The Development of Sea Warfare on Land and Its Influence on Future Naval Operations," *JRUSI*, 65 (May 1920), 293.
52. B. H. Liddell Hart, "Suggestions on the Future Development of the Combat Unit: The Tank as a Weapon of Infantry," *JRUSI*, 64 (November 1919), 667. This article antedates the author's conversion; the argument typically acknowledges the value of tanks for infantry support while flatly denying them any larger role.
53. Louis C. Jackson, "Possibilities of the Next War," *JRUSI*, 65 (February 1920), 74; Solaire, "The Hare, the Tortoise and the Eagle," *JRUSI*, 81 (February 1936), 128.
54. A. G. Baird Smith, "Theory and Practice of Mechanization," *JRUSI*, 75 (May 1930), 304.
55. R. J. Collins, "The Mobility of Mechanized Forces," *AQ*, 22 (April 1931), 95.
56. V. H. B. Majendie, "The Future of Infantry," *AQ*, 24 (April 1932), 50.
57. Liddell Hart, "Army Exercises," p. 684.
58. A. G. Baird Smith, "The Army from Outside," *AQ*, 33 (October 1936), 153. Smith refers to the Italian problems in Ethiopia.
59. "Tanks in the Chaco War," *AQ*, 33 (January 1937), 357-58.
60. Didier Poulain, "Aircraft and Mechanized Land Warfare: The Battle of Guadalajara, 1937," *JRUSI*, 83 (May 1938), 362-67.
61. J. M. Lind, "Is Mobile Warfare in the West a Myth?" *JRUSI*, 85 (May 1940), 265.
62. See J. F. C. Fuller, "The Tank in Spain: Tactics Still Fail to Keep Pace with Technics," *Army Ordnance*, 19 (July-August 1938), 24-27.
63. J. Keith Edwards, "Second (Military) Prize Essay for 1927," *JRUSI*, 73 (August 1928), 472.
64. Liddell Hart, "Mind and Machine," p. 56.
65. W. Moore, "Mechanization and Military Policy," *JRUSI*, 73 (August 1928), 475.
66. Burnett-Stuart, "Progress of Mechanization," p. 51.
67. "The 'Garage' School of Thought," *AQ*, 21 (January 1931), 382.
68. L. A. W. B. Lachlan, "Mechanized-Mindedness," *JRUSI*, 78 (August 1933), 557.
69. G. N. Macready, "The Trend of Organization in the Army," *JRUSI*, 80 (February 1935), 3. Compare with Neil Haig, "Substance or Shadow," *JRUSI*, 66 (February 1921), 117; A. G. Baird Smith, "Army Training: The Lessons of 1927," *JRUSI*, 72 (February 1928), 53.
70. E. H. Grant, "Looking Ahead," *AQ*, 28 (April 1934), 38.
71. M. N. MacLeod, "Arms and the Map," *JRUSI*, 74 (May 1929), 352.
72. Smith, "Army Training," p. 49.
73. Solaire, "Hare, Tortoise, and Eagle," pp. 131-32.
74. Victor Wallace Germain, "Armoured Warfare: A Plea for Common Sense," *AQ*, 16 (July 1928), 374.
75. F. A. S. Clarke, "Administration and Mobility," *AQ*, 22 (July 1931), 306.
76. "A Horse! A Horse! My Kingdom for a Horse!" *AQ*, 28 (April 1934), 153.
77. H. W. Mirehouse, "The Self-Defense of the Infantry Battalion against Armoured Fighting Vehicles," *JRUSI*, 74 (August 1929), 481.
78. Such charges appeared in almost half the articles against mechanization between 1919 and 1939, but in only a fifth of those for mechanization (Hacker, "The Military and the Machine," pp. 92, 94).
79. R. J. Collins, "The Mobility of Mechanized Forces," *AQ*, 22 (April 1931), 88.
80. Grant, "Looking," p. 44.
81. Germain, p. 374.
82. F. S. B., "Modern Warfare—Mobile or Missile?" *JRUSI*, 84 (November 1939), 739.
83. G. W. Redway, "The Elimination of Infantry," *JRUSI*, 74 (February 1929), 145.
84. Mirehouse, p. 481.
85. Cooper, "Transport and Tactics," p. 328.
86. Victor Wallace Germain, "The Limitations of the Tank," *JRUSI*, 75 (February 1930), 128.
87. R. H. Allen, "The Experimental Battalion . . .," *JRUSI*, 75 (November 1930), 771.
88. A. G. Baird Smith, "On Future Warfare: Two Reviews—I," *JRUSI*, 73 (November 1928), 781.
89. "The 'Garage' School of Thought," p. 382.
90. Grant, "Looking," p. 40.
91. Deedes, "Influence," p. 39; compare with C. R. Sampson, "Aeroplanes and Armies," *JRUSI*, 75 (November 1930), 679.
92. Solaire, "Hare, Tortoise, and Eagle," p. 129.
93. Smith, "Theory and Practice," p. 306.
94. D. M. L. Gordon-Watson, "Has the Tank again Made Frontal Attack Possible?" *AQ*, 39 (October 1939), 161.
95. Hereward Wake, "The Infantry Anti-Tank Weapon," *AQ*, 17 (January 1929), 351.
96. G. MacLeod Ross, "The Utility of the Tank," *JRUSI*, 76 (November 1931), 790.
97. James Parker, Letter to the Editor, *Cavalry Journal*, 40 (September-October 1931), 55.
98. Lucy Komisar, "Violence and the Masculine Mystique," *Washington Monthly* (July 1970), 39-48. See also Susan Brownmiller, *Against Our Will: Men, Women, and Rape* (New York: Simon and Schuster, 1975), ch. 3; and J. Glenn Gray, *The Warriors: Reflections on Men in Battle* (New York: Harcourt, Brace, 1959), ch. 3.
99. Maurice R. Davie, *The Evolution of War: A Study of Its Role in Early Societies* (New Haven: Yale Univ. Press, 1929), ch. 2.
100. Franco Fornari, *The Psychoanalysis of War*, trans. Alenka Pfeifer (Garden City, N.Y.: Anchor, 1974), pp. 88-89, 98.

101. Adrienne Rich, *Of Woman Born: Motherhood as Experience and Institution* (New York: Bantam, 1976), pp. 76-77; Carolyn Heilbrun, *Toward a Recognition of Androgyny* (New York: Harper & Row, 1974).
102. Nevitt Sanford, *Self & Society: Social Change and Individual Development* (New York: Atherton, 1966), pp. 203-14; Milton Rokeach, *The Open and Closed Mind: Investigations into the Nature of Belief Systems and Personality Systems* (New York: Basic Books, 1960); Norman Dixon, *On the Psychology of Military Incompetence* (New York: Basic Books, 1976), pp. 110-22; Alice Rossi, personal communication.
103. This judgment is based on my analysis of the authorship of articles in *AQ* and *JRUSI*, 1919-39. Three-fifths of all authors ranked lieutenant colonel or lower, but those ranks accounted for three-fourths of the pro-mechanization articles and only half of those articles opposed. Supporters of mechanization also belonged disproportionately to the British Army's newer technical branches—Royal Army Service Corps, Royal Army Ordnance Corps, Royal Tank Corps, and Royal Corps of Signals, in that order. They accounted for two-fifths of the pro-mechanization articles but only one anti-mechanization article. Half of all authors in the two journals whose branch of service could be identified held infantry, cavalry, or artillery commissions. Three-fourths of the combat arms officers opposed mechanization and only a quarter of them supported it. For further details, see Hacker, "The Military and the Machine," pp. 78, 85-89, 230-31.
104. Percy Hambro, "The Horse and the Machine in War," *JRUSI*, 72 (February 1927), 90.
105. Wavell, "Army and Prophets," p. 665.
106. Fuller, "Development of Sea Warfare on Land," p. 253.
107. Haig, "Substance or Shadow," p. 17.
108. E. H. Grant, "Ramblings Bred of Manoeuvres," *AQ*, 10 (July 1925), 397.
109. Solaire, "Hare, Tortoise, and Eagle," p. 132.
110. These comments on the structure and style of the cases for and against mechanization are based chiefly on content analysis of 149 articles in *AQ* and *JRUSI*, 1919-39, of which 99 favored and 50 opposed mechanization (Hacker, "The Military and the Machine").
111. B. H. Liddell Hart, *The German Generals Talk* (New York: Berkley, 1958), pp. 77-78. For the contemporary skepticism of one German officer, see Hermann Foertsch, *The Art of Modern Warfare*, trans. Theodore W. Knauth (New York: Oskar Piest, 1940), pp. 158-64. See also Larry H. Addington, *The Blitzkrieg Era and the German General Staff, 1865-1941* (New Brunswick, N.J.: Rutgers Univ. Press, 1971), ch. 2; Richard T. Burke, "The German *Panzerwaffe*, 1920-1939: A Study in Institutional Change" (Ph.D. dissertation, Northwestern University, 1969); and Kenneth Macksey, *Guderian: Creator of the Blitzkrieg* (New York: Stein and Day, 1976), chs. 4-5.
112. Heinz Guderian, *Panzer Leader*, trans. Constantine Fitzgibbon (New York: Dutton, 1952), pp. 29-30.
113. As quoted in *Messenger*, p. 85.
114. See John J. T. Sweet, *Iron Arm: The Mechanization of Mussolini's Army, 1930-1940* (Westport, Conn.: Greenwood, 1980); and John Milson, *Russian Tanks, 1900-1970: The Complete Illustrated History of Soviet Armoured Theory and Design* (Harrisburg, Pa.: Stackpole, 1971).
115. Fuller, *Memoirs*, pp. 452-78; Luvaas, pp. 364-66.
116. J. F. C. Fuller, "Dictatorship and Generalship," *AQ*, 35 (October 1937), 56-67.
117. Charles de Gaulle, *Vers l'armee de metier* (Paris: Editions Berger-Levrault, 1934). An English version was somewhat misleadingly titled *The Army of the Future* (London and Melbourne: Hutchinson, 1940). On French mechanization generally, see Jeffrey J. Clarke, "Military Technology in Republican France: The Evolution of the French Armored Force, 1917-1940" (Ph.D. dissertation, Duke University, 1969).
118. Trench, "Gold Medal Essay," p. 210.
119. J. F. C. Fuller, "Is War More Horrible?" *AQ*, 31 (January 1936), 237-46.
120. Alan Bullock, *Hitler: A Study in Tyranny*, rev. ed. (New York: Bantam, 1961), p. 330.
121. Erich Fromm, *The Anatomy of Human Destructiveness* (New York: Holt, Rinehart, and Winston, 1973), pp. 344-45. See also Kate Millett, *Sexual Politics* (New York: Avon, 1971), pp. 215-29.
122. B. T. Wilson, "Modern War and Its Maze of Machines," *JRUSI*, 83 (May 1938), 326.
123. See especially H. G. Barnett, *Innovation: The Basis of Cultural Change* (New York: McGraw-Hill, 1953), pp. 291-410; Richard T. LaPiere, *Social Change* (New York: McGraw-Hill, 1965), pp. 103-211; and Everett M. Rogers with F. Floyd Shoemaker, *Communication of Innovations: A Cross-Cultural Approach*, 2d ed. (New York: Free Press, 1971).

