



# THE STORY OF TANKS

THOMAS FLEMING

Author, *The New Dealers' War*



# THE STORY OF TANKS

THOMAS FLEMING

*Author, The New Dealers' War*





Attack! The order reached the troops of [Desert Storm](#) at 2 a.m. on Sunday, February 24, 1991. Within minutes, as the command crackled over unit radios, the night was filled with the rumble of motors turning over in 1,956 [M1A1 Abrams](#) tanks. Pulses pounded as the big metal beasts rolled into southern Iraq, spearheading a massive armored thrust around the right flank of the Iraqi army, which had dug into defensive positions in and near Kuwait. Other M1A1s, many manned by U.S. Marines, led the way into Iraqi positions on the other flank.

It was a historic moment for the U.S. military. After seventy-four years of war and peace, it finally had a tank that was better than those it was about to fight. Or at least the generals somewhat nervously said the M1A1 was better. Numerous critics in and out of Congress thought otherwise. They had predicted a wide range of disasters for the Abrams, from sand-clogged engines to immobility simply from running out of gas.

Such fears were not entirely unfounded. It is a curious historical anomaly that the United States, the greatest steel producer in the Western world for generations, the nation that invented the airplane and a staggering array of other technological marvels, never fielded a good tank before the M1A1. The history of tanks has seldom attracted the attention it deserves from readers of military history or even from the generals who purport to make that history.

The first tank was born out of a desperate desire to break the bloody infantry stalemate on the Western Front in [World War I](#). The [Mark I](#), designed by the British in 1915, weighed twenty-eight tons and had a top speed of four miles per hour. With armor half an inch thick, it carried a crew of eight, four of whom spent their time driving it and working the primitive gears of its 105-horsepower engine. The other four fired two six-pound cannon and four machine guns. Ventilation was poor, the heat was overwhelming, and there was no suspension system, which meant the men inside bounced around like tennis balls.

Plague by breakdowns, fires, and barely trained crews, the Mark I nevertheless created temporary consternation on the Western Front in the late summer and fall of 1916. German infantry ran or surrendered in droves. The British, encouraged by the early results, next fielded a light tank, the fourteen-ton [Mark A Whippet](#), with a crew of three, a speed of eight miles per hour, and a range of forty miles. Its four machine guns jutted in four different directions from a fixed turret. The driver had to operate two separate engines, combining their speeds to change direction.

The French concentrated on a lightweight tank, the [Renault FT](#), weighing almost seven tons, with a two-man crew and a single machine gun or thirty-seven-millimeter cannon. It had a speed of about a half a mile per hour. The Americans bought several hundred of these thinly armored vehicles, and they saw action in the battles of Saint-Mihiel and the Argonne under the command of Lieutenant Colonel [George S. Patton, Jr.](#), who put the stamp of his aggressive personality on American tankers from the start. He personally selected every officer in the brigade. Not surprisingly, most of them shared his intense approach to making war.

Captain Harry H. Semmes of Maryland commanded Company A of the 1st Battalion of the American tank brigade at Saint-Mihiel. That meant that his was the lead tank in the

first American armored attack. As the company clanked forward, Patton climbed onto Semmes' turret and stayed there until machine-gun fire began chipping the paint beneath his feet. Semmes stopped the tank and announced he would not advance another inch until Patton quit trying to get himself killed. Patton grudgingly admitted that he had a point and dismounted.

Semmes was keenly aware of the significance of his new weapon. "It was an incredible thrill to hear machine-gun fire clatter against your armor and know you were invulnerable to it," he recalled. "All around you the infantry was burrowing into the ground for safety. The tanker attacked no matter what they were shooting at him."

At Saint-Mihiel, the Germans' resistance was halfhearted; they were already retreating from the salient when the Americans stormed out of their trenches. By the third day, Kaiser [Wilhelm II](#)'s generals had pulled back most of their troops to their main defenses in the [Hindenburg Line](#), leaving a wide no-man's-land. Patton promptly launched a reconnaissance in force with his tanks. After a half-day without sighting a German, they encountered a squadron of the 2nd U.S. Cavalry on a similar mission. It was a key moment in the evolution of the tank: Patton was using his machines to do what had previously been the cavalry's job. As it happened, Captain [Ernest Harmon](#), who would become one of Patton's most ferocious warriors as commander of the 2nd U.S. Armored Division in [World War II](#), was among the horsemen.

Determined to upstage the cavalry, which could not withstand machine guns or artillery, Patton ordered a three-tank patrol to advance until it made contact with the enemy. Lieutenant Ted McClure of Virginia was given command of this risky venture. About an hour later, "much firing" was heard from the direction in which he had gone. In another hour, McClure returned with the breechblock of an Austrian seventy-seven-millimeter gun. He had come under fire from a battery of them and had charged, routed the gunners, and destroyed the guns - incidentally punching a hole in the Hindenburg Line.

Patton, who had trained as a cavalryman, instantly grasped the significance of what McClure had done - and what it meant for the tank's potential. It was far more than the infantryman's helper. It was a breakthrough weapon of awesome proportions, capable of tearing an enemy apart if used in sufficient numbers and with a cavalryman's daring.

If Saint-Mihiel expanded the American tanker's horizons, the Argonne brutally contracted them. In this vast valley of tangled woods, deep ravines, and forbidding ridges, the Germans made a serious stand, and the American tankers took a terrible beating. Almost half the tank brigade's officers were wounded or killed.

Among the badly wounded was Captain Semmes, who had dismounted from his tank to lead his company through a bog at the base of Vauquois Hill, a major German strongpoint in the first day's advance. Tying a white handkerchief around his arm so the drivers could see him in the early-morning fog, Semmes strolled up and down under rifle and machine-gun fire from the elite Prussian Guards division. He finally found some terra firma and guided his tanks into the first line of German trenches. A moment later, a bullet tore off the top of his head.



Several other officers went down in similar fashion. Without radios, it was almost impossible to direct a company of these primitive tanks without getting out to give hand signals, often under fire. Later in the first day, Patton himself became a casualty, foolishly leading a pickup team of infantrymen in a frontal assault on a machine-gun nest.

Yet, there were moments when the tanks performed well in the Argonne. During the assault on the town of Cheppy, which was crammed with Germans, the 35th Division infantry showered the iron horses with praise. "The tanks with all their armament, pounded the [machine-gun] nests and pill boxes to pieces," said one soldier. "The one-pounders [thirty-seven-millimeter cannon] fired high explosives into the defenses, and the machine guns cut down the evicted gunners. It was but a work of minutes for these wheeled forts, and the front was cleared of an enemy which had delayed the advance for hours."

But the few tanks available for the battle - Patton had only 141 Renaults and twenty-eight French-manned medium tanks, called Schneiders - could not make a serious impression on the formidable German defenses. Losses quickly diminished the brigade's impact to near zero. In the first two days, ninety-three tanks were destroyed or disabled. By October 6, the brigade was down to a pathetic seventeen tanks.

The tankers ruefully discovered that their biggest problem was the people they were supposed to help: the infantry. The foot soldiers were much too willing to let the tankers advance into heavy machine-gun and artillery fire while they shouted encouragement. But, without infantry support, the tanks were soon in trouble. The Germans were equipped with antitank rifles that could penetrate the Renault's armor, and they brought seventy-seven-millimeter guns forward to point-blank range with devastating effect. Even more galling was the mechanical unreliability of the machines themselves. At least as many tanks were lost to breakdowns and ditching (getting stuck in deep trenches) as were knocked out by enemy fire.

Still, at Cheppy and a few other places, Patton's tankers had shown what they could do. Perhaps the best summary of their achievement was an early report by a German officer: "The battle started with the Allied infantry preceded by myriads of baby tanks spewed from the broth of hell."

Nevertheless, the German High Command discounted the value of the tank in World War I. They had far more confidence in their infantry's ability to break the stalemate on the Western Front. After carefully selecting the most aggressive men to be [shock troops](#), they employed, in 1917, a new kind of tactic. Instead of assigning each battalion an objective, such as a ridge-line or woods, the Germans gave the shock troops what we now call mission-oriented orders. When they broke through the enemy's defenses with the help of a massive artillery barrage, they simply kept going, shooting up command posts, throwing up roadblocks, and attacking bypassed enemy positions from the rear.

The tactics worked magnificently in three offensives the Germans launched in 1918. They tore apart whole Allied armies and scored spectacular gains. But there was one flaw: A shock trooper was still a foot soldier. He could advance only twenty or thirty miles before he dropped from exhaustion. After each German breakthrough, the British and French

were able to rush reserves from other parts of the front and re-establish a battle line. Bolstered by a million fresh American troops, the Allies managed to win the war.

In the 1920s, German officers, such as [Heinz Guderian](#) and [Erwin Rommel](#), realized that the weapon their enemies had already produced - the tank - could make their mission-oriented tactics work. Shock troops on treads would not get tired. They could go much farther, and their mobile cannon and machine guns could wreak far more havoc in the enemy rear. Instead of tying the tank to the infantry, as the British, French, and American armies continued to do, the Germans created the [panzer division](#), in which the tank was the central weapon, with motorized infantry and artillery in supporting roles. The result of these “[blitzkrieg](#)” tactics was a series of stunning victories in the first years of World War II that made [Adolf Hitler](#) the master of Europe.

Compared with what the Germans were up to, American thinking about the tank was practically nonexistent between the wars. When an obscure major named [Dwight Eisenhower](#) wrote an article in 1920, urging the Army to take more interest in armored warfare, he got a severe official rebuke for impugning “sound infantry doctrine.” Even Patton lost interest in tanks and transferred back to the cavalry. Nothing better demonstrates how torpid things were than the story of a forgotten American genius, [J. Walter Christie](#). He studied the crude tanks of World War I and created a machine that was, in most respects, a modern tank as early as 1919.

Christie had been involved in inventing and engineering since the 1870s, first in steamships, then in automobiles. During World War I, he turned his attention to military ordnance. Christie’s most important innovation in tanks was a suspension system, which added enormously to mobility in rough terrain. It also did wonders for the safety and sanity of the crew, who had often emerged from the early tanks with bones dislocated or even broken. With its six-cylinder, 120-horsepower engine, the 1919 tank could travel at seven miles per hour over rough terrain. It was equipped with a fifty-seven-millimeter cannon in the rotating turret and a .30-caliber machine gun.

Although the U.S. Army’s interest was minimal, Christie continued to improve his tank. He crammed a 338-horsepower, Liberty V-12 aircraft engine into the 1928 model, allowing it to travel more than forty miles per hour cross country. Inside its tracks, the tank had road wheels that enabled it to hit seventy miles per hour on paved highways with the tracks removed, an innovation that succeeding tank designers have yet to match. Still, the U.S. Army didn’t much care. Over time, Christie became disgusted. In 1931, badly in need of cash - he had built his tanks at his own expense - he sold his design to the [Soviets](#). They discarded the road wheels and used the rest of it to create one of the best tanks of World War II, the [T-34](#).

In May 1940, with war raging in Europe, the entire U.S. Army could muster a mere 464 tanks, and these were parceled out to various infantry divisions. Only after the Nazis had demonstrated the awesome power of the armored division did the Army finally create one. The tanks produced for these divisions ranged from awful to mediocre. The [M-3](#), known as the General Lee, was so badly made that even a near miss from enemy guns would spring rivets from its armor plate, sending them whistling around the interior of the tank

like lethal bullets. Its eleven-inch track was too narrow, so it was easily mired by mud. The turret, perched on one side of the body, could not rotate a full 360 degrees, an almost unbelievable deficiency in a tank by that time. Its thirty-seven millimeter gun was a joke. The British improved the M-3 by adding a seventy-five-millimeter gun in a sponson; they named their version the General Grant. It was still quite inferior.

The experience of Second Lieutenant Freeland A. Daubin, commander of Company A in the 1st Battalion of the 1st Armored Division, was a vivid demonstration of the Grant's weaknesses. In 1942, shortly after it landed in North Africa, Daubin's company was attacked by German [Mark IV](#) tanks, which carried seventy-five millimeter guns. Battling a Mark IV head to head, Daubin made seventeen consecutive hits with his thirty-seven-millimeter gun. They chipped some paint from the German's frontal armor. The German commander waited until he was only thirty yards away. Then he blew Daubin out of his turret with a single shot. Later, in an ambulance headed for the rear, Daubin found himself lying next to a wounded German, who confidently predicted that Germany would win the war. Why? Because the Americans built such awful tanks.

The Grant, basically a light tank, was soon discarded for the medium-weight [M-4](#), or General Sherman, which became the Allies' workhorse of the war. It, too, was inadequate. Its high, boxy profile made it an easy target, and its short seventy-five-millimeter gun was outranged a full thousand feet by the German [Panther](#), which the Nazis began producing in 1942 to deal with the Soviet T-34. Further worsening the odds, the Sherman's gun-stabilization system was so bad that gunners preferred to turn it off and rely on their cross hairs.

The Sherman was at an even worse disadvantage against the Germans' heavy tank, the [Tiger](#), which carried an eighty-eight-millimeter gun. Not only were the American and British crews murderously outranged, they had no hope of penetrating the bow armor of these sixty-eight-ton monsters. Welborn G. Dolvin ruefully remembered his experience fighting a Tiger tank near Monte Cassino in Italy in 1944. Major Dolvin, commanding thirty-five tanks, encountered a German tank column led by a Tiger. He fired first and saw his round bounce off the front of the behemoth. With majestic deliberation, the Tiger's commander trained his eighty-eight-millimeter gun on Dolvin and fired a first shot with green tracers, which gave him the range. His next shot went through the middle of Dolvin's tank, killing the driver instantly and setting the tank afire. Dolvin and the rest of the crew survived with serious burns.

Dolvin was bitter about the experience. "It fried my ass to get in the first shot and see it ricochet off. The fellow who gets in the first shot deserves to win," he said. After World War II, Dolvin, who eventually made general, became a fervent advocate of U.S. tank superiority. Meanwhile, during the struggle against Germany, thousands of U.S. and British tankers died in their second-rate Shermans.

On July 18, 1944, during [Operation Goodwood](#), an attempt to break out of the Normandy beachhead, 1,350 British- and Canadian-manned Shermans were pitted against about 400 German Tiger and Panther tanks near Caen. "Almost in one minute," wrote a British survivor, "all of the tanks of three troops and Squadron HQ were hit, blazing and



exploding.” In seventy-two hours, the Germans destroyed at least 300 Shermans. No wonder they nicknamed them for the flame thrower Ronson - they lit up every time.

Probably no incident in World War II demonstrated the stopping power of a superior tank as graphically as the exploit of [Michael Wittmann](#), the commander of a Tiger tank who encountered a British armored column near Bayeux, France. Attacking alone, Wittmann and his crew knocked out the lead Sherman with his first shot and the last Sherman in the column with his second. Rumbling down the column, he proceeded to destroy nineteen Shermans, fourteen half-tracks, and fourteen [Bren gun](#) carriers in five minutes.

By now, you may be wondering how the Allies won the war. The answer is in statistics mustered by the British historian John Ellis. The Allies achieved overwhelming superiority in everything: planes, artillery, infantry, and tanks. The United States produced more than 48,000 Shermans. General [Omar Bradley](#) ruefully conceded that they were never a match for Panthers and Tigers. But, he pointed out, “our U.S. superiority in numbers enabled us to surround the enemy in battle and knock his tanks out from their [thinly armored] flanks.” Bradley also admitted that “this willingness to expend Shermans offered little comfort to the crews who were forced to expend themselves as well.”

Air power and artillery also helped win tank battles for the Americans. Wittmann, for instance, perhaps the greatest German tank warrior of the war - with 119 victories on the Russian front alone - was killed in a carpet-bombing attack in August 1944. After the war, the commander of the 116th Panzer Division told Allied interrogators that his tanks were on their way to making a serious penetration of the Normandy beachhead when they were mauled by overwhelming air and artillery bombardments. Similar comments were common in German army reports throughout 1944 and 1945. A despairing Erwin Rommel summed up the German plight in a December 1943 message to Hitler: “British and American superiority in the air alone has again and again been so effective that all movement of major formations has been rendered completely impossible.”

American antitank guns were not much better than their tanks. The first “tank destroyers” used in North Africa were World War I-vintage, seventy-five-millimeter cannon mounted on half-tracks, whose quarter-inch armor was vulnerable to everything except small-arms fire. When one of the guns was fired broadside, its recoil often tipped the vehicle over. Harry Semmes, who had miraculously recovered from his head wound in the Argonne and fought under Patton in North Africa, said that in the presence of German tanks, the half-tracks had no alternative but to run like rabbits.

The armored divisions that landed in Normandy were equipped with a towed, fifty-seven-millimeter antitank gun, another inferior weapon. It, too, could not penetrate German bow armor. Donald Willis, a member of a gun crew in the 3rd Armored Division, recorded his dismay in his diary after examining a captured German tank in July 1944. “Their armor is much heavier than the armor on our Shermans. Also their shells are longer, with more powder. The Germans have very good weapons of war.”

In later entries, Willis grew gloomier. “Our forces are finding the large tanks of the enemy very difficult to cope with. Many of our Shermans are left burning when they meet these huge machines,” he wrote in January 1945. Willis’ diary soon became a hymn to the [P-47](#)

[Thunderbolt](#), the Army's primary ground-support plane in Europe. Again and again, Thunderbolts broke up German armor concentrations, clearing the way for the division's advance.

The one good antitank weapon the Americans produced in World War II was the bazooka. This "Buck Rogers gun" delivered a shaped-charge device on a shoulder-fired rocket that was powerful enough to knock out lighter German tanks, such as the Mark IV, and even disable Panthers and Tigers if fired at their side armor. In North Africa, where the first bazookas went into action, a detachment of German tanks surrendered on the spot, thinking they were under fire by 105-millimeter guns.

The success of the bazooka, like that of all new weapons, diminished with time and familiarity. Its range was short, and the soldier-gunner had to expose a dangerous amount of his body to aim the rocket. In the desert or other open terrain, the bazooka's effectiveness declined steeply. On the Russian front, where immense armored clashes such as the [Battle of Kursk](#) saw as many as 3,000 tanks slugging it out, the bazooka was virtually irrelevant.

From the experience of World War II emerged an axiom that every military thinker took seriously: In the final analysis, tanks could be stopped only by better tanks. Planes could hurt tanks, but air superiority could never be assumed. In the [Battle of the Bulge](#), German tanks struck with ferocious impact in weather that grounded the Allied air force. For the record, General [Lesley J. McNair](#), who trained the American Army that fought in World War II, went to his grave denying this principle. "It is poor economy to use a \$35,000 tank to destroy another tank when the job can be done by a gun costing a fraction as much," he said in July 1941. To McNair's great frustration, the United States never produced such a gun. When victory over Germany and Japan disintegrated into the [Cold War](#) between the West and the Soviet empire, the Great Tank Race began.

Several other truths had become apparent in the course of World War II. The heavy tank and the light tank were about to go the way of the dodo. The later models of the German Tiger, which reached seventy-five tons, underscored all the problems of the heavy tank. Bridges collapsed under its weight; roads crumbled, making it impossible for other vehicles to use them. The concept of the [main battle tank](#) (MBT) - one vehicle that would combine mobility, lethality, and survivability - had been born.

Unfortunately, the next two wars tended to diminish the importance of the tank in American eyes. In [Korea](#) and [Vietnam](#), there were few tank-to-tank battles. In Korea, the enemy used World War II T-34s, which proved invulnerable to the small bazookas with which the American troops were equipped in the early fighting. Larger bazookas, developed late in World War II, were rushed into battle and soon disposed of most of the outdated enemy armor.

In mountainous Korea and the jungles of Vietnam, American tanks reverted to their original role as the infantryman's helper. The omnipotence of air power in U.S. military thinking also contributed to the malaise. The assumption that control of the air was a guarantee of victory in a land battle remained a peculiarly American axiom. So why worry too much about having a superior tank?

Rather than attempt anything new or original, the Americans simply improved the tank they had introduced at the end of World War II, the [General Pershing](#). It weighed in at forty-two tons and had a maximum road speed of thirty miles per hour. From it, the Americans derived their first generation of postwar tanks, the fifty-ton [M-47](#) and the fifty-two-ton [M-48](#), both mediocre vehicles, with profiles much too high, firepower too low, and the same thirty-mile-per-hour road speed. Their engines still ran on gasoline, making them almost guaranteed fireballs if hit in the right place.

Next came the [M-60](#), essentially an M-48 with a 105-millimeter gun and a good diesel engine. Its road speed was the same old thirty miles per hour, and its profile was still high - ten feet six inches. Clearly, the United States was not doing much original thinking about tanks and tank warfare. General [James H. Polk](#), who commanded the U.S. Army in Europe in the late 1960s, revealed this unfortunate truth in a scathing 1972 article in *Army* magazine that summed up thirty years of American tankers' frustration. He called the M-60 an inferior tank, part of a "tired, old, second-rate ... series." He lamented that the United States had been outgunned by the Germans in World War II and by Soviet-built T-34s in Korea and were in serious danger of the same experience against the newest Soviet tanks.

The postwar Soviet army remained wholly committed to tank warfare. More than satisfied with the performance of the T-34 in World War II, Moscow decided that evolution, not revolution, was the way to go. Well-sloped armor and low silhouettes, trademarks of Soviet tank design, made the postwar [T-54s and T-55s](#) formidable machines. Perhaps what was most impressive about these tanks was their weight - ten to fifteen tons less than their Western MBT counterparts, such as the M-60.

The Soviets continued their evolution with the [T-62](#) and the [T-72](#). The Israelis thought captured T-62s were good enough to integrate into their own tank corps. They particularly admired the hitting power and accuracy of the main gun. One dismayed U.S. general took a look at the T-72 and said, "The Soviets now have technical as well as numerical superiority in main battle tanks." The most startling feature of the T-72 was an autoloader for ammunition, which reduced the crew to three men.

But Soviet MBTs also had many defects, which emerged in the [Arab-Israeli wars](#). While the low silhouette added to a Soviet tank's survivability, the Soviets' determination to reduce the size of their tanks (to make them harder to hit) left so little room for the crew that no one taller than five feet four inches could fight in one. In prototypes of the T-72, the autoloader revealed a distressing tendency to load vital parts of the gunner, who was jammed next to it. One U.S. Army tanker who studied Israeli-captured tanks said, "We believe this is how the Soviet Army Chorus gets its soprano section."

Poor ventilation was another serious problem in Soviet tanks. Fighting in hundred-degree heat against the Israelis in 1973, many Syrian and Egyptian drivers collapsed - a few were even asphyxiated - in the airless compartments of their T-55s and T-62s. Soviet designers made no attempt to protect the crew from the many projections and switches that can inflict serious spine and kidney injuries when the tank is rumbling across country. The crude transmission systems in the T-55s and T-62s required constant double clutching

from the drivers, which led to premature exhaustion.

The Arab-Israeli wars not only demonstrated the strengths and weaknesses of rival tanks, they introduced a whole new range of weapons that threatened to drive the tank from the battlefield. The most potent of these antitank devices was a guided missile using high explosives, known as a [HEAT](#) (High Explosive Anti-Tank) round. When the probe in the nose of a HEAT projectile hits a tank, it ignites the explosive, which is shaped by an internal cone into a high-velocity jet of molten metal that pierces armor like an acetylene torch.

The Soviets began developing wire-guided missiles carrying HEAT rounds in the 1950s. By the early 1970s, they had produced the [Sagger](#), which could penetrate armor sixteen inches thick. They also developed bazooka-like [RPG-7](#) launchers, which enabled the Sagers to be fired by individual foot soldiers - or gunners in light armored vehicles. In the 1973 [Yom Kippur War](#), the Sagers' destructive power caused consternation, not only in the Israeli armored corps but among tankers around the world.

Another potent tank destroyer that emerged in the 1970s was [HESH](#) (High Explosive Squash Head rounds). These splatter into a cake of plastic explosive on the tank's armor before blasting chunks of the interior plate around the crew compartment. HESH rounds are particularly destructive against MBTs' running gear and thin side and top armor. They can be delivered by guns (including tank guns) or by rockets fired from planes or helicopters.

Studying these weapons, many Americans wondered about sinking millions into developing a new tank. An inglorious experiment with building an MBT in collaboration with the West Germans in the 1960s had already disillusioned many generals and members of congress. Even the Israelis, who had begun building a tank of their own, wondered if a new strategy, with the tank in a subordinate role, was in the cards. HESH rounds could be dealt with by adding metal skirts to detonate them before they made contact with a tank's treads or side armor. But the only solution to HEAT missiles lay in improving a tank's bow and turret armor. How this could be done without sacrificing mobility baffled everyone.

The salvation of the MBT as a combat vehicle emerged, fittingly enough, from the laboratories of the country that had created the tank, Great Britain. Researchers at Chobham, the British armor center, began experimenting with layers of armor at odd angles in the mid-1960s. They soon discovered this arrangement could deflect the hot metal jet of a HEAT missile and was equally good at stopping HESH and ordinary solid projectile rounds. In 1972, excited American tankers arranged a demonstration for Army Chief of Staff General [Creighton W. Abrams](#), a World War II tanker. He watched a captured Sagger missile fired at [Chobham armor](#); the only damage was some scratches on the paint. "The tank lives again!" Abrams declared.

Renewed confidence also came from a report made by a group of American tankers who went to the Sinai Peninsula to study the hulks of the almost 1,700 tanks destroyed in the Yom Kippur War of 1973. Although Sagers accounted for a large number of the Israeli tanks obliterated in the early fighting, roughly 90 percent of all tanks demolished in the

eighteen-day conflict were the victims of other tanks.

The Israelis decided to go ahead with their new machine, the [Merkava](#) (Hebrew for “chariot”). Germany, France, and Britain also produced new MBTs on the crest of this renewed confidence in the tank. The U.S. Army - with the enthusiastic backing General Abrams - decided to build the M1. Its very name made it clear to the main contractor, Chrysler (which sold its tank business to General Dynamics in 1982), that the Army wanted not merely an improved M-60 but an entirely new tank, with the absolutely best combination of mobility, firepower, and survivability attainable.

The seven years of the M1’s development were torturous for everyone. In 1974, as prototypes were being built, General Abrams died of cancer, and the Army named the tanks for him.

For a while, it looked as if the M1 itself would be follow its sponsor to a premature grave. The tank became a favorite target of military critics, who found fault with everything about it - especially its \$2 million price tag.

A particularly noisy conflict erupted over the M1’s engine. Other Western MBTs (and Russian tanks, until their newest, the [T-80](#)) have relied on diesel engines. The main reasons are durability and the high flash point of diesel fuel. The Abrams tank substituted a gas-turbine engine, which is quieter and smaller and creates less smoke. It can run on a wide variety of fuels, including diesel. In early trials, the Abrams’ engine revealed alarming tendencies to be hypersensitive to dust and dirt. Worse, it was a fuel guzzler of shocking proportions. The Army estimated it would consume 500 gallons a day in combat. An armored division would need 600,000 gallons of fuel a day to keep fighting. It would have to be shadowed constantly by large, unarmored tanker trucks.

In 1980, the first M1 production models were delivered to the Army. Over the next years, some 8,000 entered the ranks, at a total cost of more than \$20 billion. Later models were designated M1A1 because they were equipped with a harder-hitting 120-millimeter gun and a microclimatic cooling system that would protect the crew against nuclear, chemical, and biological warfare.

Until Desert Storm, the Merkava was the only new Western MBT that had met Russian tanks in battle. During the invasion of Lebanon in 1978, the slow (twenty-five miles per hour), heavily armored Israeli chariots had no difficulty disposing of several Syrian T-72s. The big question, as the Abrams rolled into Iraq and Kuwait, was whether it could equal that performance. In the next hundred hours of war, it quickly became apparent that the answer was yes - and then some.

Battle-loaded, the Abrams weighed sixty-three tons, yet on level ground it could hit forty-one and a half miles an hour, close to the top of its class. The torsion-bar suspension, rotary shock absorbers, and extra-long tracks guaranteed not only a smooth ride but an ability to abandon highways and roll across the desert’s tricky terrain at thirty-five miles per hour without shaking the brains and guts out of the crew. The low profile - eight feet from bottom treads to turret roof - made it a difficult target for enemy gunners.

Inside the hull, the four-man crews had a staggering array of “Star Wars” technology.



Most important was the [Thermal Imaging System](#), which can see things on starless, moonless nights and peer through the dust storms a modern tank battle inevitably generates. It picks up the heat emitted by enemy targets, from infantry (known to tankers as “crunchies”) to tanks. They glow green and white against a dark green background.

In previous U.S. tanks, if the commander spotted an enemy target, he had to scream to the driver to slam on the brakes. But in the M1A1, an on-board computer linked to the main gun compensates for the rolling, pitching motion of the chassis. The driver does not even have to slow down. The gunner, manipulating his knobs, “plays” the main gun, while a laser range finder fixes the distance to the target. Within a second a computer has solved the ballistic problem, integrating everything from distance to wind velocity to the heat of the gun barrel.

The M1A1’s 120-millimeter main gun has a range of 3,500 yards - versus 2,000 yards for the best Iraqi tank, the Soviet T-72. Firing on the move, the M1A1 was hard to hit, while stopped Iraqi tanks were far easier targets for the Thermal Imaging System sights, which enabled the Americans to shoot through the smoke of burning oil wells and at night, when the Iraqi tankers were virtually blind. Finally, the almost noiseless turbine engine enabled the Americans to approach Iraqi positions with amazing stealth. A General Dynamics field representative reported that he talked to one captured Iraqi tanker who complained that the war “was not fair.” He said they never heard the Americans coming until the M1A1s were on top of them.

Not one of the 1,956 M1A1 tanks that took part in Desert Storm was lost to enemy action. Four were damaged but repairable; one burned out its motor towing another armored vehicle that had broken down. Not a single American tanker was killed. No wonder Colonel John LeMoyne, a brigade commander in the 24th Mechanized Infantry Division, declared, “The M1A1 absolutely proved itself.”

Critics who predicted the air-cooled turbine engine would suck in sand and stutter to a stop were confounded by efficient filters. True, these had to be changed often - not an easy task. There are three filters to a tank; when loaded with sand, each weighed 200 pounds. But the crews got used to hefting them, and breakdowns were averted. Foresight also dealt with the motor’s gas-guzzling propensities. The crews shut down the engines whenever their units paused in a sweep. With control of the air secure, the refueling trucks were able to follow the MBTs with little fear of enemy retaliation.

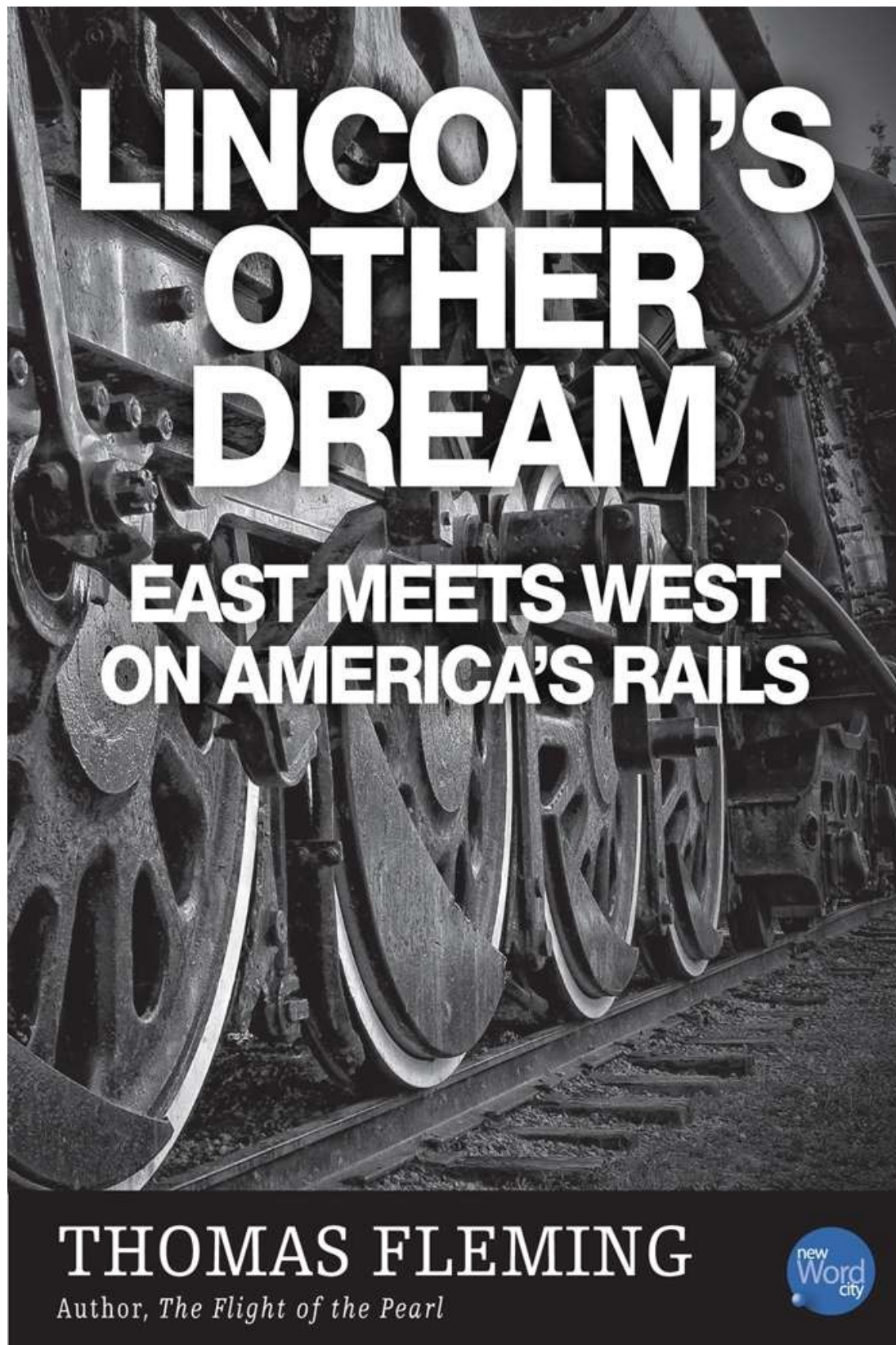
The Army did not become complacent about this Desert-Storm triumph. In May 1991, it began testing the M1A2, a tank that looked like its predecessor from the outside but inside had a whole new weapons system. Using aircraft-style avionics, the M1A2 was able to deal with a number of targets simultaneously. Over the next several years, more than 600 M1A1 tanks were upgraded to M1A2s.

M1A1s joined the infantry in the 2003 U.S. invasion of Iraq. Early in that protracted struggle, they won a victory that echoed Desert Storm. Confronting seven, enemy T-72 tanks about eighteen miles south of Baghdad, American tankers destroyed them all without the loss of a man. But, over the next few years, the Abrams revealed it was vulnerable to enemy infantry attacks, using short-range, anti-tank rockets fired at the

tracks. Even more tanks were lost to the enemy's favorite weapon, [IEDs](#) (improvised explosive devices), buried in roads and town streets. The United States has responded to ambushes in and near towns with TUSK, for Tank Urban Survival Kit. It provides added protection to the rear and side of the tank. In Afghanistan, meanwhile, the rugged terrain and the absence of enemy armor has made the tank largely superfluous. Only a handful M1A1s have been deployed there.

Nevertheless, on the battlefield of the immediate future, the axiom that emerged from World War II seems likely to prevail. Only superior tanks with well-trained crews, directed by soldiers who understand tank tactics, can stop other tanks. No other weapon has been found to match the tank's ability to dominate a combat situation with its immense striking power and mobility. It is nice to know that the United States has finally developed a good one and is continuing to improve it. The latest word from the Army is the development of a new, lighter, faster version of the M1A2, to be called the M1A3. The days of letting American tankers go into battle in inferior machines are gone forever.

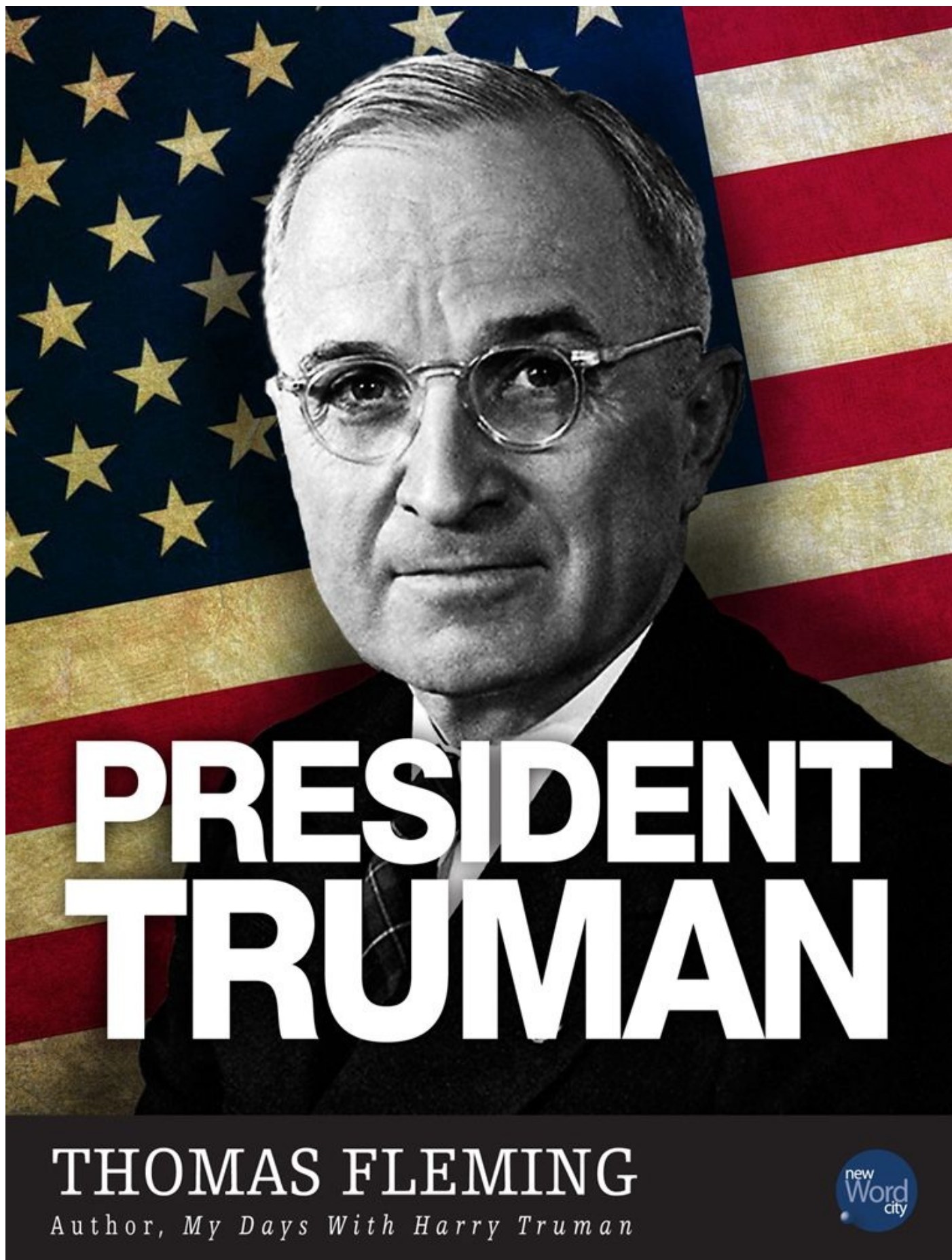
Check out these other great titles from New Word City



[Lincoln's Other Dream](#)



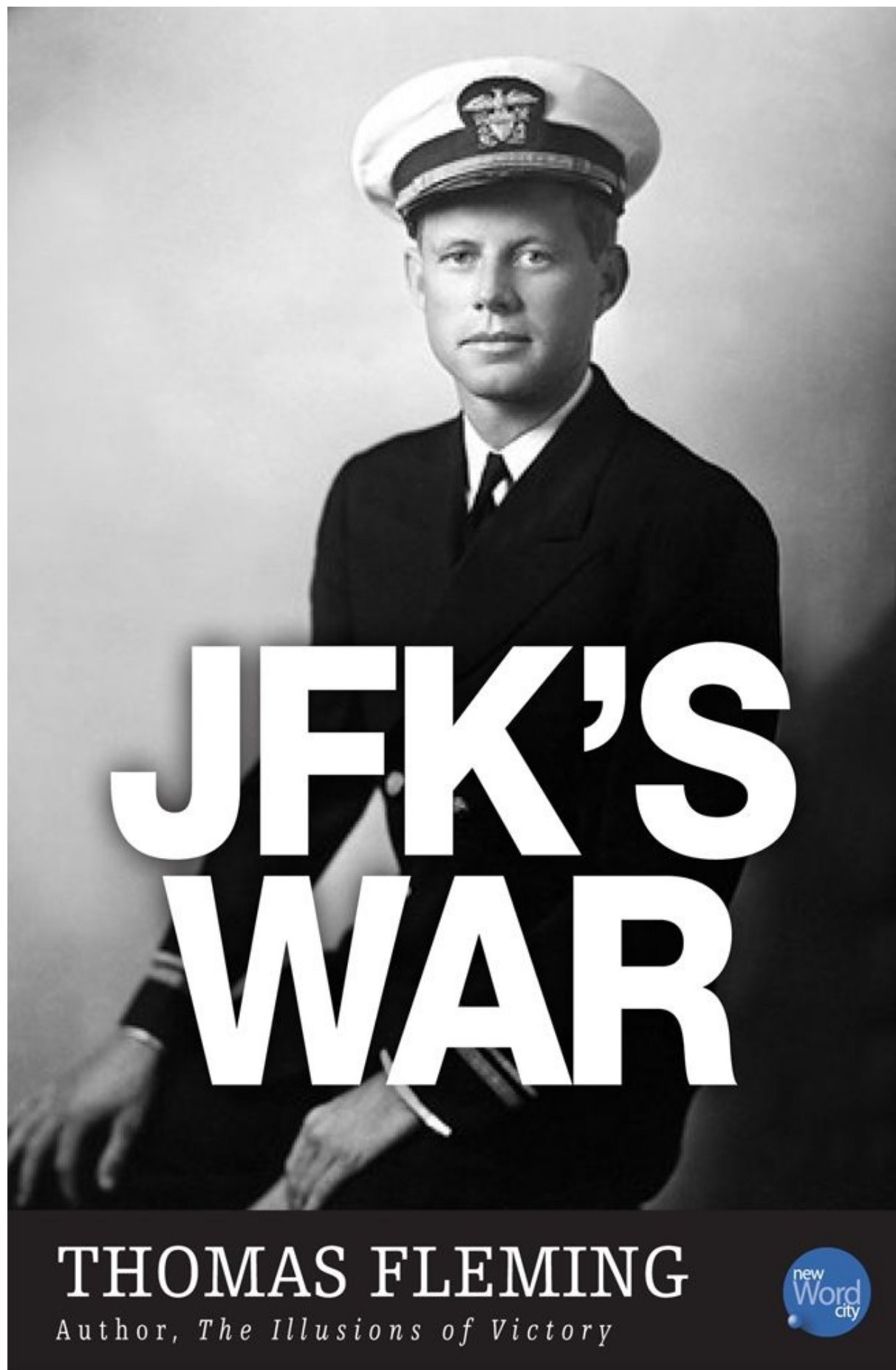




**President Truman**







**JFK's War**





# UNCONDITIONAL SURRENDER

## THE POLICY THAT PROLONGED WORLD WAR II

THOMAS FLEMING

Author, *Who Sank the Maine?*



**Unconditional Surrender**



Published by New Word City, Inc., 2012

[www.NewWordCity.com](http://www.NewWordCity.com)

© Thomas Fleming

All rights reserved. No part of this book may be reproduced, in any form or by any means, without permission in writing from the publisher.

ISBN: 978-1-61230-699-5