The “Cavalry Army” Becomes the “Hi-Tech Army”

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In his book *The Hi-Tech Army and the Cavalry Army: How Israel Abandoned the Ground Forces* (Hebrew, 2024), written mostly before the war in Gaza, Brig. Gen. (res.) Guy Hazut sharply criticizes the steadily declining importance and chronic neglect of the Israel Defense Forces (IDF) ground forces over recent decades. He critiques the division of the IDF into an elite “hi-tech army,” relying on the air force, precision-guided munitions, and special forces, on the one hand, and, on the other, the supposedly outdated “cavalry army”—the ground formations, which make up the bulk of the IDF—that have been left behind. However, the war that erupted on October 7, 2023, clearly showed that the “cavalry army” has become an essential and central part of the “hi-tech army.” Indeed, this process was already visible to discerning observers before the war and is rooted—far beyond Israel—in broad, global technological trends shaping warfare and military organization in the current era.

In his book Hazut incisively analyzes how the IDF’s ground forces reached the low point they were in before the war in Gaza. Several trends contributed to this, including the perception that the era of Israel’s large wars had ended as the Arab states steadily withdrew from the conflict; the centrality of the “campaign between the wars,” which replaced large wars as the core of Israel’s security doctrine, naturally relying on airpower and special forces; the unprecedented precision capabilities of modern weaponry; and the deep fears of significant casualties involved in deploying ground formations. The glaring lack of success in ground operations during the Second Lebanon War (2006) reinforced this trend.

As a result, the IDF’s ground forces were barely employed after the Second Lebanon War—and when they were used, such as in the operations Cast Lead, Protective Edge, and Guardian of the Walls in Gaza, their operational role was very limited. IDF divisions, which in past wars defeated the enemy through advances of dozens or hundreds of kilometers, now pushed forward only a few kilometers deep, achieving almost negligible results. As Hazut notes, this effectively created mutual deterrence between Israel and the terror armies in Lebanon and Gaza, which over time only increased their self-confidence and boldness.

The IDF’s ground forces—again, the bulk of its manpower and structure—steadily lost combat experience and underwent a moral decline. Among them, a whispered sentiment spread that “We’ve become the ‘cavalry army’”—an implicit reference to the Polish cavalry supposedly charging anachronistically against German armored divisions at the outbreak of World War II in 1939. Against this, Hazut pointed out even before the war that ground forces would be necessary to bring the enemy—hidden from view—into close combat friction, thereby exposing them to both indirect and direct fire and seizing the territories from which they operated, thus paving the way to defeating them.

Still, it is clear that the "cavalry arm"—if we return to the historical image—is not expected to fulfill its mission by charging headlong at the German armored divisions, the spearhead of that era's technological-doctrinal-operational revolution. The cavalry arms of old rightly vacated the stage, and their formations in all armies were converted into mechanized warfare, both before and after 1939. Indeed, that is precisely what has happened—and continues to happen—to the IDF's ground formations, before the war in Gaza, during it, and in its aftermath.

Technological Revolutions in Warfare—Past, Present, and Future

Far-reaching revolutions in warfare have occurred in sequence since the dawn of the industrial-technological age, each directly tied to broader revolutions in civilian technology. The First Industrial Revolution, during the 19th century, was powered by the steam engine and major advances in metallurgy and machine-based manufacturing. Railways increased the strategic mobility and logistical capacity of armies tenfold and more. At sea, while the shift from sail to steam only doubled or tripled maritime mobility, the size of iron and steel battleships also grew tenfold and more. Added to this was a revolution in information communication: electrical telegraph lines connected armies across entire countries and linked naval bases across oceans and continents in real time. Meanwhile, advances in metallurgy and machine manufacturing transformed firearms and tactics. Rifled barrels, breech-loading mechanisms, magazine rifles, rapid-firing artillery, and machine guns sharply increased range, accuracy, and rate of fire—each by about tenfold. Naval artillery underwent a similar transformation, and by the 1870s, torpedoes had been added to the arsenal.

Following the First Industrial Revolution, armies could travel by rail and be commanded via telegraph en route to the battlefield. Yet, once at the front, they reverted to the transportation and communication methods of Napoleon's era—if not Alexander's. Battlefield mobility remained limited to human muscle, while artillery and supplies were drawn by horses. Indeed, hundreds of thousands of horses were still deployed by each great power's army during World War I and, in some cases (including Germany), even during World War II. Command and control in the field, if telegraph lines had not been laid in advance, likewise depended on foot or horseback messengers. Moreover, while firepower had rocketed, soldiers—even when dispersed and taking cover—had nothing better than their skin to protect them from the storm of steel on the open battlefield. This imbalance led to the murderous tactical and operational stalemate on the Western Front in World War I. Even the meager gains achieved at a terrible cost were often nullified when infantry forces, struggling to expand their tactical foothold amid a maze of trenches, barbed wire, and enemy fire, were driven back by enemy reinforcements rushed to the front by rail.

From the late 19th century, the Second Industrial Revolution began making its mark on civilian life—and, as before, profoundly influenced the military realm. Chemicals, electricity, and the internal combustion engine were at the heart of this revolutionary wave. The chemical industry contributed both new explosives and, soon, chemical warfare. Advances in electricity brought a wide range of military applications. But it was the internal combustion engine that most decisively transformed warfare. On land, it enabled armies' mobility beyond the railway

grid. Automobiles and tractors, developed between 1895 and 1905, increased mobility on the battlefield many times over. World War I saw the introduction of the tank—essentially an armored and armed tractor—which brought mechanized mobility and armored protection to the battlefield, helping to correct the severe imbalance created by steam and the surge in firepower. Radio, by expanding real-time communication beyond fixed telegraph lines, enabled the emergence of mechanized armies on tracks and wheels during the world wars.

Simultaneously, the internal combustion engine made powered flight possible, beginning in 1903. Massive air forces emerged quickly during World War I and evolved to play leading roles in World War II. Warships, already steam-powered and clad in iron and steel armor, were less dramatically affected by the internal combustion engine, but naval warfare as a whole underwent a revolution. Dual propulsion systems—combining internal combustion and electric motors—enabled the development of the first practical submarines around 1900. Additionally, the airplane brought about the end of the heavy-gun, armored battleship. Together, the submarine and the airplane came to dominate naval warfare by World War II.

The third industrial-technological revolution, or the information revolution, was driven mainly by breakthroughs in electronics and computing, which once again transformed both civilian life and the nature of warfare. Radar (already present in World War II), followed by developments in electro-optics, television, lasers, and satellite-guided missile weapon systems, revolutionized the realms of air, air defense, air-to-ground, and naval warfare from the 1950s and 1960s onward. Rapidly improving sensors of all kinds, combined with electronic computing power that doubled roughly every 18 months, made the detection, targeting, and destruction of most hardware targets nearly guaranteed, regardless of range. In the air and at sea, the only truly effective defense lay in the same technological sphere: electronic jamming counter-systems. Electronic guidance systems found their ideal match with rocket-missile armaments. As a result, both gun-based munitions and heavy armor—which no longer provided meaningful protection—were marginalized or entirely displaced in aerial and naval combat.

Due to the complex terrain and the vastly greater number of targets, the electronic revolution's impact on land warfare lagged by several decades behind its effects in air and naval combat. It began to show in anti-tank warfare from the 1970s onward, and mainly in the air-to-ground domain. The Gulf Wars and the Kosovo conflict signaled the intensified arrival of the new age. Since then, the electronic revolution has continued advancing and entered a new phase, which some define as the Fourth Technological Revolution—across civilian life and, as before, within the military sphere. Combat systems today are increasingly integrated into electronic networks of computing, internet communication, big data, artificial intelligence, and automation-robotics. The impact of all this on ground warfare—which, until recently, was the least affected by the general electronic revolution—is now the most far-reaching.

The Present Revolution, the Wars in Ukraine and Israel, and the IDF

The Gulf Wars exposed the utter helplessness of the Iraqi army—one of the largest in the world, with dozens of divisions and thousands of tanks—against the new-age American hi-

tech military. Just four or five American divisions, supported by massive airpower, sufficed to conquer Iraq in the Second Gulf War in a one-sided display. Iraq's previous-generation mechanized army was utterly unable to mount meaningful resistance. In response, the militaries facing these new technological capabilities began adapting "disappearance" tactics—minimizing their signatures to sensors. Early signs appeared in the Syrian army's adaptations, against the Americans in Kosovo, with Hezbollah, and above all—as it became clear—with Hamas in Gaza, reaching unprecedented levels in built-up urban spaces and underground.

At the same time, the terror enemies on Israel's borders acquired their own new-age capabilities, increasingly available through supporting states and even on the open market. Hezbollah's then-advanced anti-tank capabilities already forced Israel's 401st Brigade, with its Merkava 4 tanks, into a hasty retreat in Wadi Saluki during the 2006 Lebanon War. More advanced anti-tank missiles, cruise missiles, and drones were used by Hezbollah on a broad scale in the war that broke out after October 7. Hamas, too, employed drones very effectively in its surprise attack.

For its part, Israel's military did not rest on its laurels. Its air and naval missile-electronic systems rank among the most advanced in the world. Israel is a global pioneer in developing multi-layered missile interception systems and, even earlier, in creating UAVs and subsequently attack drones with direct relevance to land battlefield. It has also developed highly advanced "fire-and-forget" anti-tank missiles and loitering munitions. The electronically guided active protection systems for armored vehicles—Trophy (and Iron Fist)—represent a global breakthrough, already acquired by US, German, British, and other armies, marking the most significant step in bringing Israel's ground forces into the new age. In the October 7 war, the Trophy system successfully neutralized Hezbollah's most advanced anti-tank missiles. Tactical light drones were introduced into IDF battalions. Before October 7, AI systems integrated with advanced sensors for target detection and precision strikes were already in use by Israel's air force and intelligence and were poised for integration into ground force weapon systems, such as the Merkava "Barak" tank and the future experimental "Carmel" tank. Robotic land systems were also in the early stages of development and integration.

Chief of Staff Aviv Kochavi led the vision that—despite considerable skepticism and institutional inertia—anticipated the revolutionary scope of the changes required to embed these new-age technologies not just in air-to-ground operations but within the land battlefield itself. Notably, Brig. Gen. (res.) Eran Ortal's book *The War Before: The IDF's Transformation Story* (Hebrew, 2022), remarkably published before the current war, stands out as an impressive document, rivaled by few in Israel or around the globe. Authored by one of the proponents of its integration into the IDF, it outlines the contours of the technological and doctrinal revolution shaping the current era of land warfare.

Wars are major accelerators of military development, driven partly by the empirical experience accumulated and the new needs and challenges they expose. The wars in Ukraine, and soon after in Israel, demonstrate this once again. The dominant role played by drones and loitering munitions in intelligence, fire direction, and kamikaze strikes came as a major

surprise—even if it had been somewhat anticipated, as it had already been demonstrated in the Armenia–Azerbaijan war of 2020. In Ukraine, much of the front-line stalemate, much emphasized by observers, has stemmed simply from the fact that neither side's armored vehicles—including the advanced Western Leopard 2 tanks supplied to Ukraine—have active, electronically guided protection systems like Trophy or Iron Fist. They alone can restore battlefield mobility in the face of the new threats.

The IDF's preparedness for the new battlefield was only partial. As detailed above, Israel remains a world leader in several areas, with systems that proved themselves impressively in the war. However, its preparedness against other emerging battlefield threats was lacking—foremost, defense against the drone and cruise missile threat, and above all, the challenge of the enemy's tunnels. Additionally, the IDF's own equipment with simpler battlefield weapons, especially tactical drones, was found to be severely inadequate.

After October 7, a mistaken consensus spread among commentators that the IDF is too small and relies too heavily on technology. However, as I have previously argued, the opposite is true: The IDF has a similar number of divisions as it did during the Yom Kippur War, when it faced about 18 enemy divisions and roughly 4,500 tanks. Its mobilized manpower—about 350,000 personnel—is several times larger than Hezbollah's and Hamas's combined. Of course, various adjustments are required: strengthening the regular forces, filling the ranks, and significantly expanding and adapting the local militia-style territorial defense in border communities to guard against terrorist surprise attacks like that of October 7. But the main challenges described above demand, above all, the development of advanced technologies: precision-guided munitions, active defense systems, connectivity, real-time intelligence, artificial intelligence, automation, and robotics—all based on electronic-computerized systems and counter-systems—and their integration into the ground force formations on the battlefield.

I will not revisit here the transformation I anticipate in the design of the tank for the electronic land battlefield. They include the abandoning the high-velocity kinetic gun—originally designed for fighting other tanks at relatively close contact ranges—and moving away from heavy armor, which is increasingly ineffective and largely redundant in light of active protection systems for combat platforms (see my previous articles on this topic below).

The "cavalry army" is in the process of transforming into a "hi-tech army," much like the transformation the air and naval forces underwent earlier, both globally and in Israel. A broad perspective—one that draws on an understanding of the nature of the technological revolutions over the past two hundred years and their far-reaching impact on shaping armies and the face of the battlefield—can help us grasp the nature of this transformation. Above all, it is critical to identify and apply the characteristics of our own era's technological revolution.

Previous Articles by the Author on This Topic:

- "The Future of the Tank and the Land Battlefield," Institute for National Security Studies, Special Publication, July 20, 2023, https://www.inss.org.il/publication/tanks/

- "Expanding Israel's Ground Forces or Prioritizing Technology?" Institute for National Security Studies, Special Publication, March 24, 2024, https://www.inss.org.il/publication/land-force/
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