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The New Threat of Very Accurate Missiles

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EXECUTIVE SUMMARY: Precision-guided medium-range missiles, a relatively new technology, are beginning to proliferate in the Middle East. When they work as designed, they can deliver half a ton of high explosive to within meters of their targets. This means that for many targets, they are almost as effective as nuclear weapons. With their capacity to destroy capital facilities like power plants, the loss of only a few of which would severely harm Israel's economy, they introduce a new way for Israel to decisively lose a war. Israel will have to get the difficult balance between offense and defense right before the next war or it may not have a second chance.

Throughout history, until 1945, a country was basically safe as long as no enemy army could invade and defeat its army. This basic strategic fact became obsolete with the invention of nuclear weapons, which could be thrown or delivered by plane over a defender's undefeated army and kill hundreds of thousands of a defender's population with a single warhead.

The first generation of intercontinental ballistic missiles (ICBMs) was not accurate enough to present much of a threat to military or strategic targets. They could not reliably hit close enough to destroy an airfield. But large nuclear weapons, each with destructive effects measured in miles, combined with ICBMs whose accuracy was similarly measured, turned the focus of war thinking toward attacks on cities. This represented a new kind of war.

A special kind of "deterrence" thus became the central topic of strategic thinking: deterrence based on the threat of a retaliatory attack that hurts the country to be deterred, but doesn't necessarily turn the balance of forces in the deterrer's favor.

This new style of deterrence says, "If you hit me, I will hit you back even if I have to do so in a way that does me no good. I will commit myself to hitting you, regardless of its effect on my situation, to stop you from hitting me first."

This paper is a narrow analysis of strategic concepts in a historical context, omitting diplomatic and arms control considerations as well as several technical issues. Throughout history, countries have faced dangers other than those posed by military attack. And in a nuclear world, there are ways of protecting yourself other than through your own nuclear deterrence.

ICBMs eventually became accurate enough that smaller nuclear weapons could be used, but not so accurate that ballistic missiles without nuclear weapons could be a strategic threat.

More recently, however, technology driven by the computer revolution began to create a new strategic situation for the great powers. This technology controlled a warhead's accuracy not by improving the precision of the missile's launch, but by guiding the missile's warhead as it approached its target.

"Terminal guidance," as this technology is known, can enable warheads to be delivered over very long distances and to hit within meters of their aim-points. The launch does not have to be perfectly accurate if the final trajectory of the warhead is controlled by guidance that depends not on the initial trajectory of the missile but on equipment on the warhead.

To survive, a country has to make sure that it is not attacked by weapons that kill a large number of its citizens or that destroy so many critical pieces of infrastructure, like power plants, that its economy will be ruined. Precision-guided missiles make it possible to threaten decisive damage with a small number of non-nuclear weapons. They can have a strategic effect, in other words, that is comparable in important ways to that of nuclear weapons.

Terminal guidance technology (much of which is based on civilian technology) is now beginning to spread among smaller powers, including some that have not acquired nuclear weapons. Before now, few countries without nuclear weapons bought or built medium-range missiles, because the warheads those missiles could deliver were not destructive enough to justify the missiles' cost. But even half a ton of high explosive, if delivered accurately, can kill a lot of people or destroy a strategic target.

That is, a precision-guided missile armed with a non-nuclear warhead can produce enough damage to justify its cost. It is reasonable to expect, therefore, that over the next twenty years or so, some smaller countries that do not possess medium-range

missiles might acquire such missiles with terminal guidance. The future might reveal a world in which a number of countries – especially in the Middle East – are armed with precision-guided missiles.

Now, many countries participate in the Missile Technology Control Regime (MTCR), which stipulates that they neither produce nor help others produce any missile that can deliver a half-ton payload over a distance beyond 300 km. Most countries seem to be observing this limitation. But until recently, the ineffectiveness of non-nuclear missiles meant that countries were not giving up anything useful by refraining from building them. As precision guidance technology spreads, it is unclear whether as many countries will continue to refrain from buying or building such weapons.

Up to now, the fundamental strategic situation was different for the great powers versus the less advanced countries. The less advanced countries lived in the traditional world in which they could only be militarily defeated by an enemy army invading their territory and defeating their army. The countries threatened by superpowers could have decisive damage inflicted on them by distant enemies leaping over their armies.

But if terminal guidance technology spreads to more countries (and possibly to terrorist groups), we will be living in a new world. Many governments will have to recognize that countries all over their region, or even those more distant, will have the ability to inflict decisive damage on them. On the other hand, at a reasonable cost, they themselves will be able to acquire the ability to inflict significant damage on distant enemies, either to deter attacks or for political benefit.

This prospect of a world containing many missile-armed countries, and perhaps missile-armed terror organizations, is distinctly unattractive. This is not only because of the bad effect such a scenario would have on political relationships and the prospects for peace. Limited missile forces, like those many small powers would be likely to possess, may not be effective unless they are fired first. There could be some trigger-happy regions in such a world.

Much attention has been given to the need to avoid becoming a world containing many small nuclear powers. But there is another possibility: that the world will contain many countries in possession of precision-guided missiles. These missiles can't kill as many people as nuclear weapons can, but they can still produce many casualties and cause significant strategic damage.

The effects of precision-guided missiles are similar enough to those of nuclear weapons that if they became commonplace, the world's strategic situation would change significantly from what it has been historically. A world of widespread precision-guided missiles is not as dangerous as a world containing many nuclear

powers, but it would still be much more dangerous than the current world or the worlds of the past.

Israel has, unfortunately, been the first to enter this new world of precision-guided missiles. It faces at least two enemies that already have this capability, or are likely to have it within the next few years (Iran and Hezbollah). Someday, Hamas might also acquire such weapons.

For many years, long-range missiles were not a serious danger to Israel because they were not accurate. Without nuclear warheads attached, they could produce only limited damage. During the second Lebanon war, Israel was hit with some 4,000 missiles (mostly short-range rockets and mortars) but suffered only some 53 fatalities, including 44 civilians, and limited (but substantial) property damage.

Iran recently acquired the technologies that make very accurate medium-range missiles possible, and other regional powers may have done so as well. Iran is thought to have delivered missiles to Hezbollah that are designed to reach deep into Israel and deliver 500 kg of high explosive to within meters of their targets. We don't know how well or how reliably these missiles work.

Accurate missiles make another kind of war possible because they create a new way that Israel can be defeated even if it wins the old forms of war. Consider the hypothetical possibility of a war with Hezbollah that results in Hezbollah ground forces being defeated so badly that other Lebanese are able to regain control of their country, and a large part of Lebanon's infrastructure is destroyed. But at the same time, Israel could suffer thousands of civilian deaths, as well as the destruction of its main electric power plants, water desalination capabilities, international airport, and other critical infrastructure.

Two-thirds of Israel's electricity is produced by only six power plants. The harm caused by the destruction of those six plants would be immense, although the degree of harm would depend on how fast they could be rebuilt and on how efficiently the electricity from smaller plants could be used. Similarly, the impact on Israel of the destruction of the country's water desalination plants would depend on how efficiently other sources of water could be used. People would have enough water to drink as soon as the distribution system was working, but most irrigation might need to be stopped.

Nobody knows how badly life in Israel would be hurt by a small number of missiles destroying important structures. But the loss of electricity alone would be immensely damaging to Israel's standard of living and its ability to maintain its economy. And Israel, unlike most countries, could expect little if any help from its neighbors.

The IDF's effectiveness could also be sharply reduced by the destruction of key facilities. The military damage might be so great that Israel would be less able to defend its borders. Or the economic damage from a small number of missiles hitting cleverly chosen targets might be great enough to cause a significant fraction of Israelis and foreign investors to leave the country.

In other words, in this new kind of war, Israel can be fatally damaged even if it wins according to the tests and goals of the kinds of war with which the IDF has experience.

The IDF has much experience dealing with enemy missiles, but they were inaccurate. The experience therefore taught the wrong lessons for the new kind of war. The missiles of the past, and indeed most of the missiles currently facing Israel, were not accurate enough to do decisive damage.

Now that precision guidance technology has come to the region, the IDF, in addition to all its "normal" responsibilities, must make sure that no enemy can inflict a fatal blow against Israel with accurate short- or medium-range missiles carrying high explosives. Fewer than 20 or 30 missiles that succeed in exploding on target could be enough to produce a fatal blow in this new kind of war.

The IDF might therefore have to plan and organize very differently than it has in the past. This will be no small challenge, as it is very difficult for any big organization to change its conceptions to face a threat it has never seen in action.

If Hezbollah, or Hezbollah plus Hamas, is thought to have more precision-guided missiles than the IDF is confident that it can protect against, strong deterrence will limit Israel's freedom of action. It could prevent Israel from making an attack, for example, on Iran's nuclear forces.

While the IDF may recognize the new threat presented by accurate missiles, an adequate response to this threat could require a great deal of money. It is not clear that the Ministry of Defense is capable of moving large amounts of the budget from existing organizations to meet new threats, and the ministry has a long history of being extremely reluctant to use its money for defense.

Missile defense systems like Iron Dome and David's Sling are recognized as potent ways of protecting the country from the threat of accurate missiles aimed at essential Israeli infrastructure. However, some will argue that increased missile defense would provide less protection against precision-guided missiles than offensive improvements that might increase deterrence and enhance Israel's ability, in the air and on the ground, to prevent missiles from being launched.

The challenge to Israeli leadership will be to find the best balance between defense and offense and to overcome internal IDF resistance to moving budgets to implement that balance. There is good reason to fear that the IDF will not buy as much missile defense as will be needed to prevent the new kind of defeat.

Israel is not helpless before this new threat. Enemy missiles can be deterred, or destroyed on the ground, or stopped by missile defenses. And the amount of damage, particularly in terms of human casualties, caused by these missiles can be drastically reduced by civil defense.

But the battle between accurate missiles and the measures taken to protect against them is an almost wholly new part of the IDF's task. It would be easy to fail to give it the attention it needs, and to fail to divert to it the resources it requires. But we cannot afford to use a first experience of the new kind of war to learn how to win the next time. We have to get it right the first time.

In the next war, the threat to the Israeli economy, and the number of Israelis who might be killed, by accurate Hezbollah missiles may require Israel to be able to end the war successfully in a very few days. Even six days might be too long. To do this, Israel might have to threaten to use, or to actually use, some precision-guided missiles of its own to compel Iran to stop Hezbollah from further attacks.

The revolution produced by the spreading technology of precision-guidance may well not be a revolution in Israel's favor, even if it gives Israel some valuable weapons.

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