Amela Sadagic, a research associate professor at the Naval Postgraduate School Modeling, Virtual Environments and Simulation (MOVES) Institute, demonstrates the virtual sand table for urban warfare operations training rehearsals 22 July 2009 during the MOVES 9th Annual Research Summit in Monterey, California. (Photo by Mass Communication Specialist 3rd Class John Fischer, U.S. Navy)

Understanding Information as a Weapon

The Virtual Reality/Sand Table Model of Information Conflict

Lt. Col. Jon Herrmann, U.S. Air Force Reserve
Lt. Col. Brian Steed, U.S. Army

Col. Ulysses stared up at the side of a mountain and swore under his breath. Solid stone and a mile high, the mountain blocked what the colonel had meant to be the main line of attack. "Alright, intel, what is this? Tradition or manufactured? Was it here and we missed it? Or, did they pull it up out of the ground?"

"We don't know, sir. Checking now." Came the tinny reply in his headset.

"Fantastic. End simulation."

As the virtual reality vanished, the colonel stepped out of the graphic simulation of the information environment. The mountain represented cultural resistance to his attack—his message intended to persuade a particular target group. It was also an ugly surprise. He could try to blow it up, using a barrage of actions, delivered as documented factual words and images, but that risked calling attention to it and bolstering the mountain. The colonel knew that his subordinate commanders would be able to see that in their simulations as informational "defenders" hunkered down into entrenched ideological positions, but seeing that might not offer insight. On the other hand, he could advance the informational offense by going "around the mountain," using slowly developed stories to move the target population's opinion little by little. The question was whether he had time.

Thousands of commanders in history faced similar decisions of fast and risky or slow and cautious. The difference was that this time, the mountain was information. Like it or not, information is less predictable and infinitely more fluid than stone. The colonel offered up a brief prayer that his network was better able to handle, or even thrive on, chaos than that of his opponent. Then, he gave the order to take on the mountain headlong. Chatbots spun up to reinforce the message strike and generate diversionary, broadly supporting messages. Driving trend lines comprised only a small portion of the fight, though. Ulysses stepped back into the virtual reality to try to keep situational awareness over the information "terrain."

While not as many of us have worked with a sand table as did earlier generations of warriors, we can all envision one. Even children in sandboxes or on the beach can imagine what structures of sand might look like, or how they might change. That ease of imagination makes a sand table a useful model for anyone seeking a simpler way to understand or explain what information conflict "looks like." A more advanced model, as described above, might be virtual reality, with its ability to create, destroy, and manipulate "solid" structures at machine speeds. Whether it is sand or electrons, senior leaders—military and otherwise—have to develop the skill of envisioning the information environment to enable rapid decisions with the same kinds of experience-based intuition commanders have long relied on in physical battlespace. The information environment, for example, is not created when the military arrives; it has existed, often for centuries or millennia in the history and culture of an area, its languages and legends, its familial, tribal, and personal identities, and more. No one creates the information environment; like terrain and weather, it already exists and must be overcome when negative and used to best advantage when positive.

War is largely about options—creating, constraining, or maximizing the choices before us. At the tactical, operational, or strategic level, we seek to maintain or increase

Lt. Col. Brian L. Steed, U.S. Army, is an assistant professor of military history at the U.S. Army Command and General Staff College, Fort Leavenworth, Kansas, and a Middle East foreign area officer. He originated the theory of maneuver in the narrative space as part of his PhD work at the University of Missouri–Kansas City, and he placed emphasis on the effective use of cultural awareness to develop influence in his 2014 book *Bees and Spiders: Applied Cultural Awareness and the Art of Cross-Cultural Influence.*

Lt. Col. Jon Herrmann, U.S. Air Force Reserve, is a career information operations and intelligence officer with over twenty-five years of experience. He holds an MS in international service from American University and an MA in political science from George Mason University. He has served as reserve/executive faculty with the National Intelligence University Masters of Strategic Intelligence program since 2013 and currently supports Department of Defense activities in analytic tradecraft education. His prior employment has focused on information operations and intelligence plans; training and instructional systems design; strategic and operational level staff; and advice/consultation to senior leaders in military, research, and academic institutions.

Men and women prepare for jobs in the Army or in industry in a 1943 camouflage class at New York University, New York. They made models from aerial photographs, rephotographed them, then worked out a camouflage scheme and made a final photograph. Detailed representations of the terrain like that shown here help military leaders during their planning by enabling their visualization of the terrain on which they will be operating. (Library of Congress photo)

our options and decrease those available to our adversaries. We can think of weapons and tactics as means to remove options from our enemies or add options for ourselves. Destroying a bridge or seizing key terrain serves to remove options from an adversary, while we maintain or gain options. This concept helps explain why commanders have used chess to teach warfare for centuries. Modern warfare relies on the same concepts. Economic warfare can make some options difficult or impossible to afford. Information has many differences from land warfare, but this core premise can help make information conflict clearer.

Envision two groups of miniature military figures facing one another across a flat, featureless sand table. Each player in the game can manipulate not only the soldiers but also the environment, therefore, making the sand table anything but featureless. Each player has a strategy in mind and a preference for what the environment will look like to best use that strategy. Each player seeks to manipulate the environment to hinder his opponent. By representing the information environment in a physical manner, the complex, often misunderstood information environment can be better comprehended. The initial terrain is not flat like that of a chessboard. It has terrain based on the history, language, and culture of the affected group, whether that is a nation, ethnicity, religious sect, or any other group. Some "terrain" is recent and can be affected relatively easily, such as sand in the physical world. Other "terrain" is deeply linked to history and culture, and is as hard to manipulate as granite.

It is worth mentioning that players are trying to affect others in their home terrain while simultaneously

protecting their own. War games must depict the varied combat zones. One way to gain a powerful edge is to make your opponent's terrain as much like your own as possible, extending the home-field advantage. A nation that prefers a flat, open field, for example, might

likes the initial situation—a flat table. Flat tables—with fewer restrictions—maximize the use of technology, and Ulysses likes tech. Charlie wants to slow things down. Charlie digs trenches in the sand table, builds up hills, and creates pathways to nowhere. He pours water on

Emulating military sand table techniques used for planning combat operations, a board game titled Stabilization Operations in Highly Religious Societies was developed by Law Enforcement Crisis Management (LECMgt) for use by the military and other government agencies to prepare leaders to deal with the dynamics of complex environments with a dominant information component apart from, or in tandem with, kinetic operations. The game introduces students to how religious factors infuse postconflict, reconstruction, and stabilization dynamics, from economics to security, to health care, and to social services. This game has been adopted for use in training simulations by several military institutions of learning including the National Defense University and the U.S. Military Academy. (Photo courtesy of Dr. Roger Mason, LECMgt LLC)

try to flatten and open an opponent's terrain. Tactics of speed and coordination would become more effective. Sun Tzu called for generals to adapt their tactics and capabilities to make use of the terrain in the physical realm.[1] In the information battlespace, generals can also adapt the terrain to maximize their use of their preferred tactics and capabilities.

In this example, we will call the players Ulysses and Charlie. Ulysses likes to play fast, moving his soldiers all over the board, relying on fast movement and good coordination to win. Charlie likes slow, cautious play, using his advantage in soldiers. Charlie rarely makes a decisive move, but it is powerful when he does. Ulysses

the table to create rivers, and drops a cloth over part of the board, making it hard to see what is going on there. Ulysses wants as many options as possible (the flat table). Charlie wants to remove as many options as possible so that he can focus his efforts against Ulysses. Charlie does not want to fight everywhere at once. Charlie uses hills, valleys, water, and concealment to reduce Ulysses's good options, even to deny Ulysses a clear understanding of what his options may be. These actions also help Charlie more because he is the defending local, and he already knows the terrain, whereas Ulysses, as an invader, has to learn where the terrain features are. Confusion, opacity, or any other denial of information benefits the defender,

because the defender already knows much of what the denial prevents the invader from learning.

What do all these effects mean when translated to real terms? Charlie dropping a cloth over part of the sand table is analogous to camouflage, concealment, and deception operations. By denying Ulysses the ability to see what part of the board looks like, Charlie makes it risky for Ulysses to plan how to use his soldiers in that area. If Ulysses puts a major effort against the covered area, and there is nothing of value there, then Charlie has a large advantage in other areas. If Ulysses puts too few resources there, then Charlie may be able to seize that area with little cost. Even forcing Ulysses to think about the covered area uses cognitive resources, tiring Ulysses mentally. Exhaustion makes Ulysses more error prone as the game goes on. Further, as a native defender, Charlie wants to use exhaustion as his primary strategy, not simply as a tactical advantage. Charlie wants to exhaust Ulysses's resources and force Ulysses to fight against an unsupportive populace at home and in the conflict theater.

But, information has far more utility than simple camouflage, concealment, and deception. What if Charlie creates an incline (or maneuvers so that Ulysses must advance up an existing incline), making his side of the board higher than Ulysses? We can see parallels to this in adversaries targeting a powerful nation's will to fight. Each extra step becomes an uphill battle, requiring more resources than the enemy's actions moving downhill. Public support generates momentum. Lack of support, or opposition, makes Ulysses's battle an uphill fight. Physical harm, casualties among soldiers and civilians, is a means to reduce public support—one example of a method long used to increase the uphill slope for continued conflict.

Charlie can build sand walls as well, making entire areas off limits. In traditional war, that might have meant actual fortress walls or impassable terrain. In the information war, that might mean making an option no longer politically viable, persuading civilian leaders to deny the option to commanders on the battlefield. Examples might include using a religious site or hospital as a base of operations, "walling off" the option of an attack on the headquarters, and leaving only a lengthy, expensive counterinsurgency as an open "path."

Not all informational effects are equal. Public sentiment opposes using nuclear weapons. That international norm has been in place for decades. As such, it constrains the use of such weapons (though the strength of that constraint remains debatable). However, when one party to the conflict does not have nuclear weapons, or has far fewer nuclear weapons, then their prohibition is far less difficult. Envision that as a hill on the sand table that is incredibly steep for one party, walling off an option. The other side may be gently sloped, leaving the option available, if more difficult, for a group willing to reject international norms. Likewise, continuing the casualty analogy above, if one party is very averse to casualties, the slope of the sand hill is severe for that party but gentler for parties less concerned with casualties.

The role of civilians in conflict serves as an additional example of informational asymmetry. In Carl von Clausewitz's era, professional militaries disdained the involvement of civilians. Napoleon's Grande Armée and the concept of total war demonstrated that civilians matter a great deal in war, and that the lines between combatants and noncombatants can blur relatively easily. As the Western militaries have become all-volunteer and increasingly professionalized, Western information terrain has sloped more and more steeply against the use of civilians, or even the draft. Other groups, though, face a gentler slope, as their cultures are more accepting of civilians as resources in conflict—in large part, because of the daily reality that civilians *are* resources in conflicts.

Rivers that are hard to cross can exemplify undesirable options, representing that crossing requires specialized messaging. (The specialized messaging may be presented as a bridge-layer, for example, or a floating bridge.) Rivers, mountains, and sloped terrain can all help a traditional commander better think through the problems of the informational environment. How fast can one side build relative to the other side's ability to tear down? Is one side relying on more fragile defenses or structures than the other? What terrain is easy to build on (cultural metanarratives, e.g., seen as rock solid foundations) and what ground is hard to build on (trends and fads, best visualized as swampy informational terrain)?

Cultural terrain exists, and it is a key factor in informational conflict. Envisioning a potential opponent as a walled city (hard to enter but also hard for an enemy to attack from) implies different tactics than an opponent that is more akin to a misty jungle, where movement is slow but possible, and the terrain is uncertain, difficult to understand, or map. In our example, that may appear in the victory conditions. For example, perhaps Charlie wins

when he has closed off or made undesirable most options, and he has pressed Ulysses to the point that the best option remaining is surrender and withdrawal of the miniature soldiers. The game is not worth it anymore. The will to fight is gone.

Regardless of the specific metaphors, commanders are finding the informational environment difficult to grasp and even more difficult as a battlespace. Using a model that explains the information battlespace in physical terms could enrich understanding. Granted, no model can depict every aspect of a complex environment. Misuse or misunderstanding of a model can lead a commander astray. However, if the limitations of the model are well understood, there are lessons to be learned. Regardless of the model used, America has to get a better understanding of the information battlespace. If this model can advance that cause, then it is worth considering. ■

Note

1. Sun Tzu, *The Art of War*, trans. Samuel B. Griffith (New York: Oxford University Press, 1963), 117, 116, 131. "An army prefers high ground to low … / Fight downhill; do not ascend to attack. / Do not attack an enemy who occupies key ground."