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Smartbomb

On a rainy day in October 2003, at the annual conference of the Association of the United States Army, Dr. Michael Macedonia is wandering through Hall C of the Washington, D.C., Convention Center, checking out the latest wares from the hundreds of companies that do business with the U.S. Army. Lockheed Martin, Boeing, and United Defense are there, showing off tanks the size of mobile homes, 40-mm grenade launchers, thirty-round semiautomatic submachine guns, and the latest in war-gaming simulations.

Macedonia is a beefy, big-faced man packed tightly into a black suit. He wears his black hair scooped up and away from his face in a Ronald Reagan-style pompadour. The son of a prominent Army man, Macedonia grew up everywhere, from Kansas to Paris, France. He moved so much, in fact, that he calls his alma mater, West Point, the closest thing he has to a home. He's played many different roles in his life in the Army, from project manager on automated electronic warfare system

development to fighting in the first Gulf War. Macedonia is prone to slapping people on the back and telling jokes with a booming laugh that he lets loose regularly. There's something defensive and sad about his eyes, though, that makes you think of a little boy trapped in a grown man's body.

Today, Macedonia is the chief scientist and technical director for the Simulation, Training, and Instrumentation Command (formerly known as STRICOM, and now known by the acronym PEO STRI). As such, Macedonia is the equivalent of a chief technical officer in a private-sector company. He helps the Army invest in technology to train its soldiers, an increasingly important part of Army philosophy since the 1970s when, as Macedonia recounts with a laugh, "We trained soldiers for six weeks, taught them how to polish their boots and fire their weapons, and then we sent them to Vietnam where they got killed."

A self-proclaimed "total geek," Macedonia may have dedicated his life to the Army, but his heart belongs to a world inhabited by science fiction, computers, and videogames—these are the things that make his gaze relax and his voice loosen. After serving in the first Gulf War, Macedonia even thought about leaving the military altogether to pursue his dream of starting a massively multiplayer online game company. His PhD from the Naval Postgraduate School, after all, was in networking military simulations, which, as he says, "is basically the same thing." When he couldn't get funding for a start-up game company, Macedonia decided to stay in the Army. Fortunately for him, the U.S. military is now undergoing some of the biggest changes in a century, and he may just get the opportunity to fulfill his science-fiction-fueled videogame dreams anyway.

Macedonia stops by a particularly loud tent in Hall C, where

a movie-sized screen is showing digital animation of jungles, urban terrains, and deserts. Little digital enemy soldiers bob and weave their way to the foreground. A row of *real* men kneel before the backdrop with slightly modified Javelin M2 grenade launchers on their shoulders that recoil, boom, and let off smoke just like real Javelin M2s, but without actually shooting bullets. The spokesman for Cubix, the defense contractor that built this training simulation, the EST 2000, says to think of it like an old arcade game. But instead of blowing plastic frogs off their lily pads or plastic cowboys off their horses, you're learning to aim at and kill "enemies." The men in khaki kneeling before the big screen are having a blast, which is good, because Cubix built the thing to be fun. Macedonia stops to laugh with the men, and he shakes his head at the noise, and the smoke rising from the Javelins, and the sheer marvel of it all.

The wares of other companies also delight him. There's An-teon Corp., from Fairfax, Virginia, which built Topscene, a "mission rehearsal system" that used satellite images, aerial photographs, and data provided by intelligence agencies to create a 3-D visual database of Afghanistan. Before actually attacking that country two years ago, pilots played Topscene on computer consoles to help them identify targets, recognize landmarks, and learn where to expect roads and where to expect only mountains.

MultiGen-Paradigm is showing off its software tools for 3-D modeling of geographic locations. The set of tools is not unlike the ones used by the *Star Wars Galaxies* team in creating the virtual terrain of *Star Wars*. But these tools are used for modeling real locations, not imaginary ones. Before President Bush's February 2003 attack on Baghdad, fliers stepped into

the training replicas of their fighter cockpits, and thanks to the software of MultiGen-Paradigm, saw a digitized version of downtown Baghdad out their windows as they practiced flying and dropping bombs.

It all reminds Macedonia of one of his favorite books, *Ender's Game*, by Orson Scott Card. It's the near-future story of a worldwide, undisputed U.S. military superpower that has realized children are the best fighters around—as long as the fighting seems like a game. The book follows one particularly brilliant six-year-old named Ender who is handpicked to enter the national military academy where, day in and day out, the students play "the game." It's a virtual reality simulation to prepare them for an expected alien attack. At the end of the book, however, it is revealed that the most crucial practices were not practice at all, but were actually real battles, making unknowing killers out of the children soldiers.

Although this might raise a few eyebrows among nonmilitary types, Macedonia talks eagerly about the lessons to be taken from the book. He explains that it was a source of inspiration for lots of people in the military when it came out in the eighties. "I've always been fascinated by what you could do with a six-year-old," Macedonia muses.

As Macedonia wanders the halls, a little robot named the Talon is making circles around admirers in the main hall. The sergeant in charge of the thing is fiddling with a suitcase-sized remote controller to show his audience how to maneuver it. The Talon is the prototype of a drone, a hunk of metal with heavy-tread tractor wheels that can be transformed into a M203 grenade launcher or a machine gun, or simply sent out into the field as a surveillance device. In the suitcase, there are multiple video displays showing what the Talon sees, three

joysticks for controlling its motion, and numerous switches and buttons for making it run through its paces. It looks impossibly complicated, but the sergeant assures his audience it's not. "If you can play Nintendo," he says, "you can operate this."

The retired Army engineers in their gray suits shilling for Lockheed Martin and United Defense seem puzzled. As they show off their multimillion-dollar simulation training tools, you get the sense they're beginning to fear for their jobs. There are changes afoot. Ed Payne is debuting SIMWAR, Lockheed Martin's tool for teaching commanders how to train their brigades, which he's worked on for the past seven years. But across the plush carpet aisle from him, where the Talon is making its circles, are two military-funded *videogames*, one for recruiting, *America's Army*, and one for training, *Full Spectrum Warrior*. Ed Payne doesn't know what to make of this. SIMWAR shuns the elaborate graphics of the videogame in favor of icons—blue boxes to represent artillery supplies and so on—in a style directly reminiscent of traditional war games. It's hard not to see, however, that while it may be doctrinally correct by Army standards, SIMWAR is not nearly as engaging as what's being displayed across the carpet aisle. And that's just the point. Young ROTCs with bright cheeks, tucked into their stiff, green uniforms, are lining up to play *America's Army* and *Full Spectrum Warrior*, just like people lined up to play Willy Higinbotham's *Tennis for Two* nearly fifty years ago. They're a little glassy-eyed and utterly delighted, like you can imagine the children who followed the Pied Piper into the ocean might have been.

MACEDONIA EXPLAINS WHAT everyone in today's military knows. And indeed, it sounds remarkably like a science-fiction sce-

nario. But it's not. When the Cold War ended, the United States was left standing, the sole superpower in the world. The generals who ran what was now the most powerful military on earth woke up and realized that the kind of war for which they'd been preparing was obsolete. The entire paradigm of war—huge companies of men ready to fight to their death on predefined, well-marked battlefields—vanished. The tectonic plates of geopolitics creaked and chafed against one another, and in one of those systemic changes that happen every so often, shifted into a new configuration. The generals knew that now the enemy was not the Russian Bear, but little groups from across the globe, aligned primarily by their distaste for the United States.

Political and military leaders got together in their war rooms to strategize. They warned one another that without a new strategy, their way of life would not only cease to spread across other lands, but also could be threatened right here at home. They dubbed this period Transformation, and they gave it a capital *T* to make everyone understand how important it was. The military had to be transformed from a lumbering force of bodies with guns into a lean and nimble, technologically enhanced institution capable of fighting at a moment's notice on any terrain on earth. The future of war was going to be near-continuous, asymmetrical, spur-of-the-moment engagements. In endless meetings, papers, and conferences, the military and political leaders spelled out their plans. Transformation: it would create what they dubbed the Future Objective Force, the last remaining super military power on earth.

Then they did just what characters in science-fiction novels do when they're placed in such situations. They sought out the wise men, rounded up the finest technologists the world

had to offer. In this particular case, that meant the best of the best from the communities of virtual reality, computer graphics, simulation and modeling, artificial intelligence, and entertainment. What is in your dreams? the generals asked. What is possible that has never been possible before? For its Future Objective Force, the U.S. needed new weapons, new training devices, and a new kind of soldier. And the military didn't care where the ideas came from. The technologists were drawn from within their own network of think tanks, larger academia, and from entertainment corporations. And they envisioned for the leaders all these things, and particularly a new soldier, one that would be faster, smarter, and more lethal than any soldier that had come before. Him, they called the Future Objective Force Warrior.

A PROTOTYPE OF THE Future Objective Force Warrior, expected to be ready in 2010, is not ten feet away from the Talon, which is still making its circles in the main hall of the AUSA conference.

Showing him off is Jean-Louis "Dutch" DeGay, a member of the military PR corps. He's in a dandyish suit, and has all the flair of a natural-born midway man. You almost expect him to twirl his mustache. He gestures at the Warrior while never taking his eye off the audience, fluidly pointing out details and mentioning astounding facts and figures as if he'd been born with the information. The Future Objective Force Warrior wears lightweight, chemical-retarding fabric, has bullet-repelling breastplates and shoulder guards, and boots that redistribute his weight. There's an antenna rising from his helmet that allows him to communicate with other soldiers and his commanders on both local and wide-area networks; and there's an eyepiece

that curves over his left eye through which he can view iconic graphics and map overlays on what looks to him like a twenty-one-inch monitor.

"He's an F-Sixteen on legs," Dutch says between bursts of data, "an F-Sixteen on legs." As Dutch talks, it's easy to forget that it's actually a man standing next to him and not another artificial intelligence entity like the Talon. "The soldier is becoming a platform," Dutch says. "Once he powers up, he's a platform ready to roll out."

Strapped to the Warrior's back is a lightweight Pentium-class computer that communicates wirelessly with a PDA-like device on his wrist. Like a super brain atop the soldier's own, the computer communicates with the "platform." If for some reason the soldier's vision becomes impaired—say, his infrared optical device goes out while he's raiding a building in the dead of night—the Pentium will present a virtual representation of where he is, and he can navigate by that. Through his eyepiece he sees circular target overlays around figures in the distance, and his earpiece announces by tone whether that figure is friend or foe. The Pentium calculates the distance of the figure and informs him exactly how to aim and when to shoot. It monitors his heart rate and hydration levels. And it's also stocked with games like *Full Spectrum Warrior*, being displayed at the next booth, to keep the warrior both entertained and well trained.

Some in the military dream of a robotic army, but what people like Macedonia know is that there's no need. Sure, robots can't die, but any artificial expert worth his salt will tell you that a robot capable of making the kind of decisions modern soldiers need to make is many years and many billions of dollars away. (Even today, twenty-five years after Marvin

Minsky and John McCarthy founded MIT's Artificial Intelligence lab, there still is no computer in the world that could hold a reasonable conversation with a five-year-old child. Successful artificial intelligence is far more elusive than most people realize.) The Future Objective Force Warrior avoids the AI problem by combining the genuine intelligence of a human soldier with the computational abilities of a computer, and it integrates the pair by means of videogame-derived interfaces. And because of the ubiquity of videogames in civilian culture, recruits will begin training already comfortable with the paradigm.

Soon, the PDA device on the warrior's wrist will make him a constant participant in a virtual networked environment, or what is increasingly being known, even in military circles, as a massively multiplayer online game. This is one of Macedonia's most cherished dreams. He envisions the warriors in constant, real-time communication with their battalions, even if they're in different physical locations. Just like the way the other "characters" on the screen in *Star Wars Galaxies* or *Anarchy Online* are really other people sitting at their computers, the "characters" with whom the warriors will be playing are his fellow soldiers. It's using the paradigm of the MMO interface as a communication device—an application of technology recommended to the military by Macedonia among others. The game, Macedonia hopes, will help warriors learn the terrain and customs of wherever they're stationed. And, most important, the game will keep him in the loop, in real time, with Army intelligence, an incalculable wartime advantage.

Like in *Ender's Game*, Macedonia also wants the soldier's experience to be uninterrupted by the distractions of civilian life. Knowing that in 2005 some cell phones will have graphic capabilities roughly on par with the first PlayStation, Macedonia

dreams of an MMO for his warriors that they can play cell phone to cell phone, even when they're not in combat situations.

"I can have my soldiers always be part of the game," Macedonia says. "I can merge the real world with the virtual world. . . . I can have real people in real places interacting with real people in virtual places that are copies of the real world." He laughs his robust laugh. These are the things he loves to talk about. He pauses. "It does get really weird, and really kind of becomes science fiction at a certain point," he says. "It really is *Ender's Game*."

THE ARMY HAS always been interested in games. Generals know what kindergarten teachers know, which the videogame industry can be loath to admit: games teach. Show me the games of your children and I'll show you the next hundred years, anthropologists say. Take chess and Go. They were military simulations, albeit low-tech ones. They allowed the sons of kings and emperors to learn to think strategically; to conceptualize the battlefield; and to see firsthand, and in a no-consequences setting, the rippling effects of different moves.

It was Atari's *Battlezone* in 1980 that brought the U.S. military's gaze specifically onto the videogame. *Battlezone* was the first videogame to offer a first-person perspective. Instead of watching the action from above, the player viewed the action through the eye of a tank periscope. Thinking it would improve gunners' hand-eye coordination, the Army built a modified version of the game, changing the controls to more closely resemble a Bradley Infantry Fighting Vehicle. A couple years later, when a young designer named Gilman Louie built *Flight Simulator* for MicroProse, the military jumped on it. Today, the Air Force still gives customized copies of the game to every student pilot and undergraduate taking the Naval

Reserve Officer Training Courses, at the sixty-five colleges that offer the program. The Navy was delighted to find that students were playing the game at home in their own free time, and that those who played the game performed better than those who didn't when they stepped into the actual cockpit for training.

And just a few years before the Columbine killings introduced the rest of the country to the game, the U.S. Marines had already discovered *Doom*. A lieutenant from the Marine Corps Modeling and Simulation and Management Office modified the game by turning the original *Doom* characters into American Marines and "enemies." The twisted hallways and dank dungeons created by the id designers were altered to reflect real-world tactical situations—such as being trapped in a foxhole while repelling an enemy infantry assault, or attempting a counterattack through a barbed-wire-covered battlefield. Crumbling gothic passageways were replaced with bunkers, concertina wire, tactical emplacements, ditches, and hills. In one scenario, digitized foreign embassy floor plans were laid over one of John Romero's levels so soldiers could practice rescuing American hostages. The altered game became known as *Marine Doom*, and was so popular, according to the lieutenant, that when the *Doom* lab at his base shut down for the night, marines would beg to be allowed back in.

LIKE ALL HIGH-TECHNOLOGY industries, the videogame industry has, by default, long been intertwined with the military. The videogame industry grew out of soil the military has been tending since the 1940s, when it began pumping money into "computational devices" in an effort to beef up code-breaking and artillery-table-calculating skills needed during World

War II. William Higinbotham worked on the Manhattan Project, Ralph Baer invented the Odyssey while working at defense contractor Saunders and Associates, and the Artificial Intelligence lab where Steve Russell and his TMRC cohorts developed *Spacewar!* was funded by the Defense Advance Research Projects Agency (DARPA). Indeed, the present status of the videogame industry as a cultural and economic juggernaut has in great part been the outgrowth of military research in the fields of computing, modeling, and simulation, artificial intelligence, virtual reality, and war-gaming.

But at some point everything flipped—instead of the game-makers taking their cues from military simulations, the military began to take its cues from the gamemakers. The offspring outpaced the parent. The videogame industry shot up in all its hoary disorder, surpassing the greatest military in the world in the fields of simulation and modeling, computer graphics, networking, and interface design. And they knew how to use these technologies in a manner that could make any kind of learning entertaining and fun.

IT WAS THE Chief Imagineer at Walt Disney who helped set the ball in motion for the great videogame-military merger. In 1999 word filtered down through the chain of command from four-star general Paul Kern, who had just returned from a meeting at the Walt Disney Imagineering facility in Glendale, California. Since its founding fifty years ago, Walt Disney Imagineering has served as a hub for technological breakthroughs to be used for entertainment purposes. It was Atari's Nolan Bushnell's dream job, and it has produced some of the most technologically advanced work in the entertainment industry—from theme parks and hotels to hydraulic rides to

virtual-reality shows. When General Kern took his meeting, Disney's Imagineering facility was under the reins of a man named Brian Ferren, a well-known futurist, computer scientist, and member of the Army Science Board—described by Macedonia as a technological advisory group made up of “the country's wise men.”

After his meeting, General Kern sent a missive to those beneath him demanding to know why the military wasn't doing the kinds of things Disney was doing. “Why can't we do the same stuff as the entertainment industry? They're doing all this cool stuff,” Macedonia recalls Kern asking. He speaks in a kid's whiny voice, imitating his boss: “Why can't we be like Walt Disney?” Macedonia drops the mimicking. “I wanted to say, ‘Because you don't give us enough money.’ But generals, when they say these things, you have to come back with answers.”

Macedonia began looking around for people to help turn some of these entertainment-fueled dreams into military reality. He turned to his former thesis advisor from the Naval Postgraduate School, Mike Zyda, who had recently presented a paper then circulating among military circles. It was called “Modeling and Simulation: Linking Entertainment and Defense.”

MIKE ZYDA IS NOT on first glance the kind of character you would cast to play supertechnologist to the world's superpower. He's in his midforties, with a potbelly hanging over the top of his pants, and a little gray mustache that twitches above his mouth. A native of Southern California, Zyda has the speech intonation of a real-life Jeff Spicoli of *Fast Times at Ridgmont High*, smattering his breathy conversation with “cool” and “fave” and “awesome.” At first you think he's trying to be funny. Then you realize he's not. After spending time with

him, you also begin to realize that he actually is just the kind of guy the world's superpower would call upon in a science-fiction novel.

When he first started teaching at the Naval Postgraduate School seventeen years ago, Zyda threw away the faculty handbook that was presented to him in a binder and replaced it with a copy of Machiavelli's *The Prince*. Zyda prides himself on his ability to read people, to break down patterns of human behavior with scientific precision. Some are fascinated by people; Zyda is fascinated by what controls people. When he takes notes at meetings, he records not the subject being discussed so much as the body language of other attendees. Sweaty palms, he'll jot down. Skittish eyes.

(Occasionally, Zyda will remind you that he was born in the eye of a storm at 12:01 a.m. on September 11, 1954, as if his very birth were proof that he belongs at the center of whatever storm is currently stirring.)

Like the best pedigreed of the science-fiction wise men, Zyda has degrees in neurocybernetics, bioengineering, and Spanish literature. He's done consulting work for everyone from Paramount Pictures to the White House to the Ministry of Industrial Development in the Sabah Province of Malaysia. He's a member of the National Research Council's Committee on Scientific and Technical Challenges in Creating Virtual Reality Environments and its Aeronautics and Space Engineering Board's Committee on Advanced Engineering Environments. But it was his study “Linking Entertainment and Defense,” which he presented to the council in 1997, that put him where he is today.

Zyda happened to arrive at the Naval Postgraduate School just as the military's first serious effort to build an advanced

simulation-training device, or a networked virtual environment, was wrapping up. Commissioned by the DARPA, SIMNET, as it was called, was based on the work of virtual-reality pioneer Jack Thorpe. A simulation training tool for Army tank drivers, it was a cyberspace war game that could be played by soldiers in different physical locations by logging onto that new thing, the Internet. Think *The Sims Online*, but at war.

When DARPA and the U.S. Army Topographic Engineer Center sponsored Zyda to build the Naval Postgraduate School Net, which plugged into SIMNET, adding features like virtual helicopters that could be “flown” by real superior officers observing the virtual battle of their soldiers, Zyda found himself getting calls from “about a hundred different Department of Defense organizations.”

“From the midseventies through the midnineties, the Department of Defense was the big driver for new technology,” Zyda says. “So if you wanted to say, ‘Here is the coolest new virtual world,’ it would have been made by the DOD. In the midnineties, though, graphics cards got good for PCs. And as expenditures in entertainment R & D went up, that industry started to exceed the DOD.”

The trouble was SIMNET had cost \$140 million, and had taken ten years and hundreds of people to build. Then the military got wind of *Doom*, which was created by a team of eight people working on it for six months, at a total cost of about \$25,000. And it had achieved far more than the SIMNET team had dared to dream—not only was it networked, but it was also visually stunning, fast-paced, and *engaging*. When the Nintendo 64 came out in 1996 with its incredible graphic advances all housed in a machine the size of a tissue box, people like Zyda began to get excited. Zyda imagined military tools

that weren’t created by a “bunch of engineers,” but rather by artists. “Linking Entertainment and Defense” was based on Zyda’s musing of what would happen if a little entertainment pixie dust could be sprinkled over the clanking simulations the Army was producing. His former pupil, Macedonia, adopted the same tack.

“The reason we’re turning to the entertainment industry is that here at STRICOM, we have old men designing our simulators,” Macedonia explains. “I’m not exaggerating. They’re in their forties and fifties, and the last videogame they played was *Pong*, or maybe *Pac-Man* over drinks. And what happens is they bleed the life out of these simulations. They’re engineers. They design by committee. And one thing we’ve learned from our psychologists here is that emotion is critical to learning, and that one of the key aspects of eliciting emotion is being able to provide a story. It goes all the way back to Homer. Look at *The Iliad* and the oral tradition—that was the way history was taught. The only way to remember all these facts was you put them into a story. A story is a way for folks to be able to understand, to absorb, and to retain. And frankly, I don’t have a lot of storytellers here.”

So, at Macedonia’s request, Zyda, who in the meantime had grown sour on the internal politics of the Naval Postgraduate School and was eager for a road out, spent the first six months of 1999 transforming his report into a proposal for an institute dedicated to developing training simulations and combat warfare systems for the Army, but staffed by the best people the entertainment industry could provide.

The result was the Institute for Creative Technology, or ICT, a joint venture between the University of Southern California and the U.S. Army, opened at the end of a palm-tree-lined street in Marina Del Ray, California, with \$45 million in

military funding. The offices were designed by the same man who designed the original starship *Enterprise* for *Star Trek*. *Apocalypse Now* screenwriter John Milius was brought in as a consultant along with *Big Top Pee-Wee* director Randall Kleiser, special effects guru Paul Debevec, and former president of the Motion Picture Association Jack Valenti. Relationships formed quickly with videogame companies such as Pandemic, Quick-silver, and Sony ImagingWork.

Zyda, naturally, expected to get the top post at whatever school the military would decide to fund. But when the University of Southern California got the bid, Elizabeth Daly, the dean responsible for hiring the director, began to evade his queries. When Macedonia became hard to reach on the phone, Zyda grew wary. After a couple of weak handshakes from USC honchos, Zyda invited a fellow Naval Postgraduate School professor named John Hiles out to lunch with him. Hiles, a soft-spoken, rotund man who used to work for Will Wright, agreed to meet him at their favorite Chinese restaurant, the Great Wall. It was their equivalent of war-gaming a scenario. Zyda explained the situation to Hiles, and together they drew bubble diagrams of all the players in Zyda's drama, with arrows to represent relationships and possible outcomes.

Both Hiles and Zyda are at the forefront of a new movement, growing out of advances in the field of cognitive psychology, that is attempting to accurately model human behavior into a computer system. Although Will Wright likes to say, "Once you're alive, you become very hard to model," Hiles likes to insist, "Once you've been educated, you become very easy to model." Hiles believes that after about the age of five, most people are molded by their education and their societies into fairly predictable entities. Like Zyda, he is perfecting his

theories with funding from the military. His most recent project, Iago, is a computer model built on information about Ramsey Yousef, the Islamic jihadist involved in the attack on the World Trade Center in 1993. The model simulates how Yousef, or someone like Yousef, might react to current events in the news.

As the waitress brought them their tea and the check, Hiles pointed to a bubble around USC's Elizabeth Daly. There's your problem, Hiles said. Based on the model they built, Hiles concluded that Daly wanted to hire someone from within her ring of personal entertainment contacts for the top spot at the new institute. Sure enough, a former Paramount executive, Dick Lindheim, was named the ICT's director.

While Zyda was left up in Monterey stewing, the Institute for Creative Technology began work on its first project, *Full Spectrum Warrior*, a commercial-grade videogame designed by Pandemic, published by THQ, and built to run on the Microsoft Xbox. The idea for *Full Spectrum Warrior* was to ship it first to the Army as a training tool, and then to sell a version to the public through the commercial markets. (While the Army itself is not allowed to profit off such a project, the companies involved are.) The game's main selling point is that it's the most realistic Army game of all time. So while kids across the world are revving up their Xboxes to play at war, soldiers around the world will be revving up theirs—placed in areas where soldiers gather, like mess halls and rec rooms—to train for war.

Macedonia is thrilled with the idea. One of the things that had so impressed the Air Force about Gilman Louie's *Flight Simulator* was that soldiers loved to play it. Like in *Ender's Game*, the idea is to make a game out of training. It was like

suddenly finding homework that your students couldn't get enough of.

One plays *Full Spectrum Warrior* as a squad leader, and the objective is getting one's men in and out of dangerous situations safely. *Full Spectrum Warrior* teaches such things as stacked formation, securing of exits, what part of a room to search first when you take over a building, and why it's important to ensure no one is on a higher floor waiting to run down and ambush you. Speed, methodology, and behaving as a collective are the key lessons. Indeed, while the debate over videogames and violence has raged since the days of *Missile Command*, the military, at least, has concluded that there is no direct correlation between playing videogames and an increased urge to kill. But that doesn't mean they're not effective military training tools. For the kinds of hands-off killing preached by the modern military, homicidal rage is hardly a requirement. In fact, as laid out explicitly in the Department of Defense's 2003 study "Training for Future Conflicts," the modern American military increasingly wants soldiers who are more than just bodies with guns. It's all part of Donald Rumsfeld's vision of a world of war where American soldiers do their killing long-distance. "The transformation of the military will increase the cognitive demands on even the most junior levels of the military," the report says. Its primary finding: "In short, everybody must think."

In other words, the Army now needs people who can make instantaneous decisions, work with amoebalike coordination with their squads, and handle advanced, computer-controlled warfare systems. As CluffyB has been known to point out, that's a pretty good description of your average hardcore gamer.

The ICT's other big project is also borrowed from fiction.

Under Macedonia's guidance, they're building a real-life holodeck, à la *Star Trek*. The idea for the project, originally called the Sensory Environments Evaluation Project, is to elicit the kinds of emotions soldiers are likely to feel when going into battle. This is the domain of Jacqueline Morie, a small woman in a loose dress and with messy hair, who looks as if she'd be more at home in a Berkeley art studio than working for the Army. Indeed, before joining the ICT, Morie was an artist, specializing in large-scale installments designed to evoke emotion.

Today, Morie spends her time at the ICT in an amphitheater, surrounded by a 150-degree curved screen as high as the ceiling. Three projectors in the back of the room blend their images onto the enormous screen, which is viewed by participants wearing head-mounted displays to make it all appear three-dimensional. Participants are given joysticks with which to facilitate their character's movement. They can go forward, backward, sideways, just like in any modern videogame. Morie's aim is not to make something that is photorealistic, but rather to create a sense of what she calls "presence," an environment that *feels* real on a deep emotional level.

On the holodeck, it's dead of night in war-torn Bosnia. Put on your headset, and you're dropped into a remote village along the Vrbas River to spy on an abandoned mill complex suspected of housing enemies. The graphics are as sophisticated as 2003's *Quake III*, which is to say, they're as sophisticated as it gets. After your mission, which also includes collecting certain items missing from the American containment area, you are expected to report to your superior officer on your findings. Dogs bark, water trickles, and people you can't see murmur in the distance. Trees bend slightly in the wind; a bridge creaks and then sways as a truck rolls over it.

The tires make grinding noises on the pebbles that line the road. Beneath your feet on the holodeck, a custom-built sub-woofer system rumbles at a frequency your ear cannot detect, but which increases your visceral reaction to the experience. More obvious sounds project from speakers all around the room. The bark of a dog up ahead and to the left sounds as if it is, indeed, coming from up ahead and to the left. Occasional pieces of debris fall and make clunking noises.

Morie, being convinced that smell is the most underrated of all the senses, has designed a necklace participants wear that lets off certain smells at specific times through the mission. The whole point of the exercise is to create as *real* and *immersive* an experience as possible—the same keywords videogame makers use all the time. Indeed, standing on the holodeck feels like being *inside* a videogame.

What the military hopes to achieve through the holodeck is to train soldiers for the emotional experience of their first battle. It's common knowledge in the Army that the highest casualty rates in war are among novice soldiers; living through your first battle seriously ups your chances of living through the next. It's scary being in the holodeck, partly because it feels so much like being in a war situation, and partly because it feels as if the traditional walls that separate reality from unreality, fact from fiction, are melting. Perhaps it's a little too reminiscent of the game room in *Ender's Game*.

Mike Zyda might have been left up at the Naval Postgraduate School raging at his betrayal at the hands of his former student had it not been for one fatal flaw in the dream of Transformation. Donald Rumsfeld assured the American public that actual human bodies would hardly be needed for the Bush administration's 2003 invasion of Iraq. But it turns out that even

in the Future Objective Force, soldiers are needed. It's all very well to develop the most sophisticated training tools the world has ever known, but if you don't have anybody to train, there's a problem. While war-themed games fly off the shelves of stores and many a retired military man makes an income advising these videogame companies, wanting to play at war isn't the same as actually wanting to sign up for it.

The United States hasn't had a draft in more than thirty years, and no politician with any interest in staying in power is keen to reintroduce one. The mores of our time tell people to be individuals above all else and never to allow themselves to be cogs in someone else's machine. But armies are all about turning boys and girls into soldiers, which are, essentially, fighting cogs. In a world of relativism, living for the moment, and personal success as the ultimate achievement, it's hard to convince people that they ought to risk their lives in a moderate-paying job that might end in a layoff or might end in death. Recruitment has been such a problem that the military has tripled its recruitment budget, from less than \$200 million in 1993 to almost \$600 million in 2003. And in its desperation for Future Objective Force Warriors rather than just guys with guns, it has adopted incentives like \$20,000 sign-up bonuses for recruits who can do information technology work. If the war in Iraq has taught us anything, it's that the U.S. military is woefully understaffed in the warrior department.

COLONEL CASEY WARDYNSKI is a small, lithe man, with steel-gray hair cropped close to his head; small, flat ears; and intelligent blue eyes that are almost hypnotic in their intensity. He's a graduate of West Point with a degree in economics and political science, and he has a PhD in policy analysis from the

Rand Corporation. Early in his career, while handling logistics and security for the movement of nuclear material around the world, Colonel Wardynski got interested in computers. The result was a program called Special Weapons Information Management System, or SWIM, which the Department of Defense, the Navy, and the Air Force adopted to keep track of the post-Cold War nuclear-weapon stockpile. Wardynski's program, which he wrote in six months, helped reduce the rate of error in accounting for nuclear materials from 50 percent to 0.2 percent. Today, Wardynski is a professor of economics at West Point and runs the office of Economic and Manpower Analysis for the Army, which means he does things like figure out how to recruit Afghani citizens to join the Afghan National Army, and fly over to Baghdad to run statistical models on manpower needs.

Colonel Wardynski is a smart man, and he grasped the same fundamental truth about videogames that first-person shooters learn. "What a videogame does," Wardynski says, "at heart, is teach you how, in the midst of utter chaos, to know what is important and what is not, and to act on that."

Colonel Wardynski believes in his work. He has the true believer's trust in the good of his country. He's a self-described patriot, who exudes both honesty and toughness, the kind of man you can imagine you'd follow into battle should he lead you there. Colonel Wardynski knew about Transformation. And he knew that the United States wasn't going to get very far if it couldn't get its recruitment numbers up. In 1999, around the same time that Mike Zyda was working on his plan for the ICT at Michael Macedonia's request, Colonel Wardynski had an epiphany.

"I realized we had to get the flow of information about life

in the Army into pop culture," Colonel Wardynski says. He had realized that kids no longer had contact with people who could tell them stories about life in the Army. Vietnam was unmentionable, the first Gulf War had used a relatively small force, and veterans of World War II were dying out. That's when it hit him. "What do kids do with their time?" he asked himself. "Oh, they play videogames. Where do they search for information? Oh, on the Internet. So that's where we have to be."

With the pragmatism of a military man, Colonel Wardynski was simply acknowledging what family groups have been screaming about for years. Pop culture has become an underground education system for American children. Study after study shows that kids spend far more time engaged with media than they do at school or with their parents. In any society, people get their ideas about life, what's important, and who they want to be from the messages of their culture. Our culture happens to be one dominated by mass consumer entertainment. So that's where the Army would go. And, conveniently for the military, pop culture had come to mean videogames. Even at West Point, internal statistics showed that more than 80 percent of the student body played videogames.

The Army has been trying to reach teenagers through their devotion to the videogame for years. It's almost impossible to open a videogame magazine or log onto a videogame Web site without being besieged by advertisements for the Army. "An Army of One" ads crop up regularly in *Electronic Gaming Monthly* and *Game Informer*. Sign up for a videogame Web site, and you're likely to get pop-up ads for the Army haunting your computer for months to come. But while this attention from the military may have helped sell some military-based

commercial games, it didn't seem to help with actual recruitment. It was Colonel Wardynski who realized that the mode of communication between the Army and the youth had to be the videogame itself. Like a virus in a computer, it would spread the word about life in the Army.

Wardynski had heard about the ICT. He arranged meetings with Macedonia and the former Paramount executive, Dick Lindheim, but they couldn't agree on what it was Wardynski was dreaming about. The ICT was about training. Wardynski was interested in recruiting.

A friend recommended he get in touch with a professor at the Naval Postgraduate School in Monterey, California, who might be able to help him out. There, Wardynski met Mike Zyda. By the time Wardynski got to him, Zyda had just started a new institute on the grounds of the Naval Postgraduate School called the MOVES Institute, for "Modeling, Virtual Environments, and Simulation." MOVES, which boasted people like Gilman Louie and Jack Thorpe on its board, was Zyda's revenge for losing stewardship of the ICT. The call from Wardynski was a reprieve, both a balm to his wounded ego and a delight to his intellect.

Although Zyda and Wardynski could not appear more different, they turned out to be ideal working partners. Within a few months, Wardynski had gotten Zyda funding for MOVES's first gig, the Army Games Project, from the Assistant Secretary of the Army for Manpower and Reserve Affairs. Their first mandate was to create *America's Army*, a game that would be downloadable for free from the Army's Web site and available as inserts in videogame magazines. The project was code-named Operation Star Fighter, after the 1984 movie *The Last Starfighter*, a film about a teenager who is recruited by aliens

to fight in an intergalactic war after getting a perfect score on his local arcade machine.

America's Army was initially slated to be the Army's search engine for star fighters. Zyda and his team had considered monitoring players' game aptitude as they played and forwarding that information directly to Army recruitment. It was certainly technologically feasible, but the team decided at the last minute that "by our cultural standards, that would just be wrong," Zyda says.

AMERICA'S ARMY WAS launched on July 4, 2002, and by the time the Academy of Interactive Arts and Sciences had invited Zyda and Wardynski to speak at DICE 2003, more than 2.4 million players had registered the game on their computers. It was also well received by the industry, getting a nomination for Best Action Game of the Year (2003) by the AIAS, as well as a host of other awards. By the time DICE 2003 rolled around, the *America's Army* franchise had become an unqualified blockbuster in the gaming world.

At DICE 2003, Zyda is giving a talk entitled "Weapons of Mass Distraction—America's Army Recruits for the Real War." Zyda is "psyched" to show *America's Army* to the videogame industry. He's standing in the glass-paned corridor of the Hard Rock overlooking the hotel's network of faux tropical swimming pools and imported sandy beaches, waiting for Wardynski to get in on a red-eye from West Point. He's mingling with people like Shigeru Miyamoto, Will Wright, Raph Koster, CliffyB, and Seamus Blackley. When he takes to the stage at 11:15 a.m., he's surprised at how many familiar faces are in the audience. He hadn't expected to know anyone, but he realizes, as he looks out into the crowd, that the room is filled

with many of the same people with whom he's been attending conferences on virtual reality, 3-D graphics, and modeling and simulation for years.

The words *America's Army* flash onto the screen behind him, projected against a background of red, white, and blue, and surrounded by a dusky sky filled with buzzing helicopters and camouflage-wearing digital soldiers running toward the camera. While Wardynski sits tight-lipped and serious in the front row of the audience, Zyda bobs his head along with the music and moves his mouth along with the words coming from the auditorium's speakers. He explains to the audience how the Army opened its coffers of visual and audio data to his team, sharing hours of footage of training camps and actual war carnage. Zyda explains how every detail of the digital action in the game, from the pine trees that surround Ft. Benning to the way bodies look flying through the air, has been modeled to a T. A young woman in the audience—not a gamemaker, but a graphic artist and cell phone technologist, who is mainly here to see futurist artist (and *Blade Runner* designer) Syd Mead talk—asks Zyda if the designers had trouble dealing with such material. Zyda totally misunderstands the nature of her question. “Oh no, it was awesome!” Zyda says.

It's a tricky line Zyda and Wardynski have to walk, using the military accuracy of the game as a selling point, while simultaneously defending it as an acceptable plaything for teenagers. Wardynski is quick to point out that 41 percent of the game shows no weapons at all, focusing instead on training routines like obstacle courses, parachuting, scuba diving, and laser tag. Wardynski was prepared for controversy over a taxpayer-funded game intended to woo teenagers and young adults into the Army, and he's been very, very careful every step of the way.

“I staked my military career on this,” Wardynski says. “My

reputation is everything I have. When you work for a four-star general, you only blow up once. It's not like in a game, where you get to start over.”

Considering all the thought and work he'd put into making the game palatable to the public as well as the military, Wardynski was pleased by the lack of controversy it aroused. Although he'd been trained to handle skeptical, even hostile reporters, there was almost nothing in the nongaming press about the game when it was released. And when it did get coverage, it was framed more as an oddity than an outrage.

The audience at DICE is equally nonplussed. There's a question about whether the game includes people coming home in body bags (it doesn't), but otherwise the most critical question Zyda receives is a complaint that his government grants give him an unfair competitive advantage over other gamemakers who have to actually raise capital to make games.

The videogame industry, unlike the generation of culture producers before them, prides itself on its apolitical stance. There is hardly a gamemaker in the upper echelons of the industry who has not been drafted for some military-sponsored project or roundtable discussion or consulting work. Raph Koster has his DOD invitation hanging on a bulletin board in his office; Will Wright wears his CIA jacket with a chuckle. The fact that this very conference is taking place only days after the U.S. invasion of Iraq doesn't seem to make these questions any more pressing. James Korris, a director at the ICT, says it's a natural post-9/11 shift, that the entertainment industry is reassessing who's really the bad guy. Wardynski says it's just that *America's Army* is not that unique. He says that it's just part of a continuum dating all the way back to the Uncle Sam posters of World War I or the propaganda movies of World War II. And he makes no apologies.

“The Army wasn’t invented by this game,” he says. “We’ve always recruited kids. I take no issue with the necessity of the U.S. having an Army. I’m not trying to convince anyone who doesn’t want to join. I believe the Army to be a noble profession, and I have no problem spreading information about it. We do have enemies. Our freedom is not secure. I want to put the idea of the Army into their space so they’ll think about it.”

When the talk is over, the several hundred men and a smattering of women pour back out into the hallway. “Whoa, that colonel—Kung Fu grip!” Alan Yu says as he comes out, impressed by Colonel Wardynski’s cool, no-bullshit manner. Otherwise, people don’t have too much to say about it. The young graphic designer, though, is near tears. “I don’t even read the newspaper or get upset about the things in the news,” she says. “But I just wanted to stand up there and say, ‘Hello! Are you people insane?’ I mean, please, tell me this isn’t real!”

FOR HIS PART, Michael Macedonia continues to dream. He wanders the halls of the October 2003 AUSA convention eight months after Zyda and Wardynski gave their spiel at DICE, and when it turns to night, he checks out a couple of the delegation parties at a hotel across the street. Nothing much is doing. There are lots of people from Florida—“it’s the simulation capital of the world!” Macedonia explains—eating satay and drinking more than they should in Hawaiian-print shirts. Macedonia puffs along in his black suit and little tasseled loafers. These are good times for him. Who would have thought that his little-boy passion would turn out to be the hot-spot nexus through which the world’s lone military

superpower would seek to merge man and machine into one heart-pumping, razor-sharp, computationally enhanced, new-age Warrior. Science fiction should *be* so good. And Macedonia has finally found what he always wanted, a home, in the future.

THE QUEST FOR ART, ENTERTAINMENT,
AND BIG BUCKS IN THE
VIDEOGAME REVOLUTION

SMART

HEATHER CHAPLIN
& AARON RUBY

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