



The Next Logical Step
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About Bova:

Benjamin William Bova (born November 8, 1932) is an American science fiction author and editor. Bova was a technical writer for Project Vanguard and later for Avco Everett in the 1960s when they did research in lasers and fluid dynamics. It was there that he met Arthur R. Kantrowitz later of the Foresight Institute. In 1971 he became editor of *Analog Science Fiction* after John W. Campbell's death. After leaving *Analog*, he went on to edit *Omni* during 1978-1982. In 1974 he wrote the screenplay for an episode of the children's science fiction television series *Land of the Lost* entitled "The Search". Bova was the science advisor for the failed television series *The Starlost*, leaving in disgust after the airing of the first episode. His novel *The Starcrossed* was loosely based on his experiences and featured a thinly veiled characterization of his friend and colleague Harlan Ellison. He dedicated the novel to "Cordwainer Bird", the pen name Harlan Ellison uses when he does not want to be associated with a television or film project. Bova is the President Emeritus of the National Space Society and a past President of Science-fiction and Fantasy Writers of America (SFWA). Bova went back to school in the 1980s, earning an M.A. in communications in 1987 and a Ph.D. in 1996. Bova has drawn on these meetings and experiences to create fact and fiction writings rich with references to spaceflight, lasers, artificial hearts, nanotechnology, environmentalism, fencing and martial arts, photography and artists. Bova is the author of over a hundred and fifteen books, non-fiction as well as science fiction. In 2000, he was the Author Guest of Honor at the 58th World Science Fiction Convention (Chicon 2000). Hollywood has started to take an interest in Bova's works once again, in addition to his wealth of knowledge about science and what the future may look like. In 2007, he was hired as a consultant by both Stuber/Parent Productions to provide insight into what the world is to look like in the near future for their upcoming film "Repossession Mambo" starring Jude Law and Forest Whitaker and by Silver Pictures in which he provided consulting services on the feature adaptation of Richard Morgan's "Altered Carbon".

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? "I don't really see where this problem has anything to do with me," the CIA man said. "And, frankly, there are a lot of more important things I could be doing."

Ford, the physicist, glanced at General LeRoy. The general had that quizzical expression on his face, the look that meant he was about to do something decisive.

"Would you like to see the problem first-hand?" the general asked, innocently.

The CIA man took a quick look at his wristwatch. "O.K., if it doesn't take too long. It's late enough already."

"It won't take very long, will it, Ford?" the general said, getting out of his chair.

"Not very long," Ford agreed. "Only a lifetime."

The CIA man grunted as they went to the doorway and left the general's office. Going down the dark, deserted hallway, their footsteps echoed hollowly.

"I can't overemphasize the seriousness of the problem," General LeRoy said to the CIA man. "Eight ranking members of the General Staff have either resigned their commissions or gone straight to the violent ward after just one session with the computer."

The CIA man scowled. "Is this area Secure?"

General LeRoy's face turned red. "This entire building is as Secure as any edifice in the Free World, mister. And it's empty. We're the only living people inside here at this hour. I'm not taking any chances."

"Just want to be sure."

"Perhaps if I explain the computer a little more," Ford said, changing the subject, "you'll know what to expect."

"Good idea," said the man from CIA.

"We told you that this is the most modern, most complex and delicate computer in the world ... nothing like it has ever been attempted before—anywhere."

"I know that They don't have anything like it," the CIA man agreed.

"And you also know, I suppose, that it was built to simulate actual war situations. We fight wars in this computer ... wars with missiles and bombs and gas. Real wars, complete down to the tiniest detail. The computer tells us what will actually happen to every missile, every city, every man ... who dies, how many planes are lost, how many trucks will fail to start on a cold morning, whether a battle is won or lost ... "

General LeRoy interrupted. "The computer runs these analyses for both sides, so we can see what's happening to Them, too."

The CIA man gestured impatiently. "War games simulations aren't new. You've been doing them for years."

"Yes, but this machine is different," Ford pointed out. "It not only gives a much more detailed war game. It's the next logical step in the development of machine-simulated war games." He hesitated dramatically.

"Well, what is it?"

"We've added a variation of the electro-encephalograph ... "

The CIA man stopped walking. "The electro-what?"

"Electro-encephalograph. You know, a recording device that reads the electrical patterns of your brain. Like the electro-cardiograph."

"Oh."

"But you see, we've given the EEG a reverse twist. Instead of using a machine that makes a recording of the brain's electrical wave output, we've developed a device that will take the computer's readout tapes, and turn them into electrical patterns that are put *into* your brain!"

"I don't get it."

General LeRoy took over. "You sit at the machine's control console. A helmet is placed over your head. You set the machine in operation. You *see* the results."

"Yes," Ford went on. "Instead of reading rows of figures from the computer's printer ... you actually see the war being fought. Complete visual and auditory hallucinations. You can watch the progress of the battles, and as you change strategy and tactics you can see the results before your eyes."

"The idea, originally, was to make it easier for the General Staff to visualize strategic situations," General LeRoy said.

"But every one who's used the machine has either resigned his commission or gone insane," Ford added.

The CIA man cocked an eye at LeRoy. "You've used the computer."

"Correct."

"And you have neither resigned nor cracked up."

General LeRoy nodded. "I called you in."

Before the CIA man could comment, Ford said, "The computer's right inside this doorway. Let's get this over with while the building is still empty."

They stepped in. The physicist and the general showed the CIA man through the room-filling rows of massive consoles.

"It's all transistorized and subminiaturized, of course," Ford explained. "That's the only way we could build so much detail into the machine and still have it small enough to fit inside a single building."

"A single building?"

"Oh yes; this is only the control section. Most of this building is taken up by the circuits, the memory banks, and the rest of it."

"Hm-m-m."

They showed him finally to a small desk, studded with control buttons and dials. The single spotlight above the desk lit it brilliantly, in harsh contrast to the semidarkness of the rest of the room.

"Since you've never run the computer before," Ford said, "General LeRoy will do the controlling. You just sit and watch what happens."

The general sat in one of the well-padded chairs and donned a grotesque headgear that was connected to the desk by a half-dozen wires. The CIA man took his chair slowly.

When they put one of the bulky helmets on him, he looked up at them, squinting a little in the bright light. "This ... this isn't going to ... well, do me any damage, is it?"

"My goodness, no," Ford said. "You mean mentally? No, of course not. You're not on the General Staff, so it shouldn't ... it won't ... affect you the way it did the others. Their reaction had nothing to do with the computer *per se* ..."

"Several civilians have used the computer with no ill effects," General LeRoy said. "Ford has used it many times."

The CIA man nodded, and they closed the transparent visor over his face. He sat there and watched General LeRoy press a series of buttons, then turn a dial.

"Can you hear me?" The general's voice came muffled through the helmet.

"Yes," he said.

"All right. Here we go. You're familiar with Situation One-Two-One? That's what we're going to be seeing."

Situation One-Two-One was a standard war game. The CIA man was well acquainted with it. He watched the general flip a switch, then sit back and fold his arms over his chest. A row of lights on the desk console began blinking on and off, one, two, three ... down to the end of the row, then back to the beginning again, on and off, on and off ...

And then, somehow, he could see it!

He was poised incredibly somewhere in space, and he could see it all in a funny, blurry-double-sighted, dream-like way. He seemed to be

seeing several pictures and hearing many voices, all at once. It was all mixed up, and yet it made a weird kind of sense.

For a panicked instant he wanted to rip the helmet off his head. *It's only an illusion*, he told himself, forcing calm on his unwilling nerves. *Only an illusion.*

But it seemed strangely real.

He was watching the Gulf of Mexico. He could see Florida off to his right, and the arching coast of the southeastern United States. He could even make out the Rio Grande River.

Situation One-Two-One started, he remembered, with the discovery of missile-bearing Enemy submarines in the Gulf. Even as he watched the whole area—as though perched on a satellite—he could see, underwater and close-up, the menacing shadowy figure of a submarine gliding through the crystal blue sea.

He saw, too, a patrol plane as it spotted the submarine and sent an urgent radio warning.

The underwater picture dissolved in a bewildering burst of bubbles. A missile had been launched. Within seconds, another burst—this time a nuclear depth charge—utterly destroyed the submarine.

It was confusing. He was everywhere at once. The details were overpowering, but the total picture was agonizingly clear.

Six submarines fired missiles from the Gulf of Mexico. Four were immediately sunk, but too late. New Orleans, St. Louis and three Air Force bases were obliterated by hydrogen-fusion warheads.

The CIA man was familiar with the opening stages of the war. The first missile fired at the United States was the signal for whole fleets of missiles and bombers to launch themselves at the Enemy. It was confusing to see the world at once; at times he could not tell if the fireball and mushroom cloud was over Chicago or Shanghai, New York or Novosibirsk, Baltimore or Budapest.

It did not make much difference, really. They all got it in the first few hours of the war; as did London and Moscow, Washington and Peking, Detroit and Delhi, and many, many more.

The defensive systems on all sides seemed to operate well, except that there were never enough anti-missiles. Defensive systems were expensive compared to attack rockets. It was cheaper to build a deterrent than to defend against it.

The missiles flashed up from submarines and railway cars, from underground silos and stratospheric jets; secret ones fired off automatically when a certain airbase command post ceased beaming out a restraining

radio signal. The defensive systems were simply overloaded. And when the bombs ran out, the missiles carried dust and germs and gas. On and on. For six days and six firelit nights. Launch, boost, coast, re-enter, death.

And now it was over, the CIA man thought. The missiles were all gone. The airplanes were exhausted. The nations that had built the weapons no longer existed. By all the rules he knew of, the war should have been ended.

Yet the fighting did not end. The machine knew better. There were still many ways to kill an enemy. Time-tested ways. There were armies fighting in four continents, armies that had marched overland, or splashed ashore from the sea, or dropped out of the skies.

Incredibly, the war went on. When the tanks ran out of gas, and the flame throwers became useless, and even the prosaic artillery pieces had no more rounds to fire, there were still simple guns and even simpler bayonets and swords.

The proud armies, the descendents of the Alexanders and Caesars and Temujins and Wellingtons and Grants and Rommels, relived their evolution in reverse.

The war went on. Slowly, inevitably, the armies split apart into smaller and smaller units, until the tortured countryside that so recently had felt the impact of nuclear war once again knew the tread of bands of armed marauders. The tiny savage groups, stranded in alien lands, far from the homes and families that they knew to be destroyed, carried on a mockery of war, lived off the land, fought their own countrymen if the occasion suited, and revived the ancient terror of hand-wielded, personal, one-head-at-a-time killing.

The CIA man watched the world disintegrate. Death was an individual business now, and none the better for no longer being mass-produced. In agonized fascination he saw the myriad ways in which a man might die. Murder was only one of them. Radiation, disease, toxic gases that lingered and drifted on the once-innocent winds, and—finally—the most efficient destroyer of them all: starvation.

Three billion people (give or take a meaningless hundred million) lived on the planet Earth when the war began. Now, with the tenuous thread of civilization burned away, most of those who were not killed by the fighting itself succumbed inexorably to starvation.

Not everyone died, of course. Life went on. Some were lucky.

A long darkness settled on the world. Life went on for a few, a pitiful few, a bitter, hateful, suspicious, savage few. Cities became pestholes. Books became fuel. Knowledge died. Civilization was completely gone from the planet Earth.

The helmet was lifted slowly off his head. The CIA man found that he was too weak to raise his arms and help. He was shivering and damp with perspiration.

"Now you see," Ford said quietly, "why the military men cracked up when they used the computer."

General LeRoy, even, was pale. "How can a man with any conscience at all direct a military operation when he knows that *that* will be the consequence?"

The CIA man struck up a cigarette and pulled hard on it. He exhaled sharply. "Are all the war games ... like that? Every plan?"

"Some are worse," Ford said. "We picked an average one for you. Even some of the 'brushfire' games get out of hand and end up like that."

"So ... what do you intend to do? Why did you call me in? What can *I* do?"

"You're with CIA," the general said. "Don't you handle espionage?"

"Yes, but what's that got to do with it?"

The general looked at him. "It seems to me that the next logical step is to make damned certain that *They* get the plans to this computer ... and fast!" ?

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