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THOUGHTS ON THE 125TH ANNIVERSARY OF
THE BATTLE OF GETTYSBURG*

by Carl Sagan

[Thank you Judge Spicer. I'm moved and honored to join you in the commemoration of this doleful and instructive milestone in world history.]

Fifty-one thousand human beings were killed or wounded here -- ancestors of some of us, brothers of us all. This was the first full-fledged example of an industrialized war, with machine-made arms and railroad transport of men and materiel. This was the first hint of an age yet to come, our age; an intimation of what technology bent to the purposes of war might be capable. The new Spencer repeating rifle was used here. In May 1863, a reconnaissance balloon of the Army of the Potomac detected movement of Confederate troops across the Rappahannock River, the beginning of the campaign that led to the Battle of Gettysburg. That balloon was a precursor of air forces and strategic bombing and reconnaissance satellites.

A few hundred artillery pieces were deployed in the three-day battle of Gettysburg. What could they do? What was war like

*Principal address delivered at the 125th Anniversary Celebration of the Battle of Gettysburg, and the Rededication Ceremonies of the Eternal Light Peace Memorial, Gettysburg, Pennsylvania. This speech, written with Ann Druyan and delivered on July 3, 1988, was heard by 30,000 people.

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then? Here is an eyewitness account by Frank Haskel of Wisconsin, who fought on this battlefield for the Union Armies. It is from a letter to his brother:

We could not often see the shell before it burst, but sometimes, as we faced towards the enemy and looked above our heads, the approach would be heralded by a prolonged hiss, which always seemed to me to be a line of something tangible terminating in a black globe distinct to the eye as the sound had been to the ear. The shell would seem to stop and hang suspended in the air an instant and then vanish in fire and smoke and noise. . . . Not ten yards away from us a shell burst among some bushes where sat three or four orderlies holding horses. Two of the men and one horse were killed.

It was a typical event from the Battle of Gettysburg. Something like it was repeated thousands of times. Those ballistic projectiles, launched from the cannons that you can see all over this Gettysburg Memorial, had a range, at best, of a few miles. The amount of explosive in the most formidable of them was some twenty pounds -- roughly one-hundredth of a ton of TNT. It was enough to kill a few people.

But the most powerful chemical explosives used 80 years later, in World War II, were the blockbusters, so-called because they could destroy a city block. Dropped from aircraft, after a journey of hundreds of miles, each carried about ten tons of TNT, a thousand times more than the most powerful weapon at the Battle of Gettysburg. A blockbuster could kill a few dozen people.

At the very end of World War II, the United States used the first atomic bombs to annihilate two Japanese cities. Each of

those weapons had the equivalent power of about ten thousand tons of TNT, enough to kill a few hundred thousand people. One bomb.

A few years later the United States and the Soviet Union developed the first thermonuclear weapons, the first hydrogen bombs. Some of them had an explosive yield equivalent to ten million tons of TNT; enough to kill a few million people. One bomb. Strategic nuclear weapons can now be launched to any place on the planet. Everywhere on Earth is a potential battlefield now.

Each of these technological triumphs advanced the art of mass murder by a factor of a thousand. From Gettysburg to the blockbuster, a thousand times more explosive energy; from the blockbuster to the atomic bomb, a thousand times more; and from the atomic bomb to the hydrogen bomb a thousand times still more. A thousand times a thousand, times a thousand is a billion; in less than one century, our most fearful weapon has become a billion times more deadly. But we have not become a billion times wiser in the generations that stretch from Gettysburg to us.

The souls that perished here would find the carnage of which we are now capable unspeakable. Today, the United States and the Soviet Union have booby-trapped our planet with almost 60,000 nuclear weapons. Sixty thousand nuclear weapons! Even a small fraction of the strategic arsenals could without question annihilate the two contending superpowers, probably destroy the

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global civilization, and possibly render the human species extinct. No nation, no man should have such power. We distribute these instruments of apocalypse all over our fragile world, and justify it on the grounds that it has made us safe. We have made a fool's bargain.

The 51,000 casualties here at Gettysburg represented one-third of the Confederate army, and one-quarter of the Union army. All those who died, with one or two exceptions, were soldiers. The best-known exception was a civilian in her own house who thought to bake a loaf of bread and, through two closed doors, was shot to death; her name was Jennie Wade. But in a global thermonuclear war, almost all the casualties will be civilians -- men, women and children, including vast numbers of citizens of nations that had no part in the quarrel that led to the war, nations far removed from the northern mid-latitude "target zone." There will be billions of Jennie Wades. Everyone on Earth is now at risk.

In Washington there is a memorial to the Americans who died in the most recent major U.S. war, the one in Southeast Asia. Some 58,000 Americans perished, not a very different number from the casualties here at Gettysburg. (I ignore, as we too often do, the one or two million Vietnamese, Laotians and Kampuchians who also died in that war.) Think of that dark, somber, beautiful, moving, touching memorial. Think of how long it is; actually, not much longer than a suburban street. 58,000 names.

Imagine now that we are so foolish or inattentive as to permit a nuclear war to occur, and that, somehow, a similar memorial wall is built. How long would it have to be to contain the names of all those who will die in a major nuclear war? About a thousand miles long. It would stretch from here in Pennsylvania to Missouri. But of course, there would be no one to build it, and very few to read the roster of the fallen.

In 1945, at the close of World War II, the United States and the Soviet Union were virtually invulnerable. The United States -- bounded east and west by vast and impassable oceans, north and south by weak and friendly neighbors -- had the most effective armed forces, and the most powerful economy on the planet. We had nothing to fear. So we built nuclear weapons and their delivery systems. We initiated and vigorously pumped up an arms race with the Soviet Union. When we were done, everyone in the United States had handed their lives over to the leaders of the Soviet Union. Today, if Moscow decides we should die, twenty minutes later we're dead. In nearly perfect symmetry, the Soviet Union had the largest standing army in the world in 1945, and no significant military threats to worry about. It joined the United States in the nuclear arms race so that today everyone in the Soviet Union has handed their lives over to the leaders of the United States. If Washington decides they should die, twenty minutes later they're dead. The lives of every American and every Soviet citizen are now in the hands of a foreign power. I

say we have made a fool's bargain. We -- we Americans, we Soviets -- have spent 43 years and vast national treasure in making ourselves exquisitely vulnerable to instant annihilation. We have done it in the name of patriotism and "national security," so no one is supposed to question it.

Two months before Gettysburg, on May 3, 1963, there was a Confederate triumph, the battle of Chancellorsville. On the moonlit evening following the victory, General Stonewall Jackson and his staff, returning to the Confederate lines, were mistaken for Union cavalry. Jackson was shot twice in error by his own men. He died of his wounds.

We make mistakes. We kill our own.

There are some who claim that since we have not yet had an accidental nuclear war, the precautions being taken to prevent one must be adequate. But not three years ago we witnessed the disasters of the Challenger space shuttle and the Chernobyl nuclear power plant -- high technology systems, one American, one Soviet, into which enormous quantities of national prestige had been invested. There were compelling reasons to prevent these disasters. In the preceding year, confident assertions were made by officials of both nations that no accidents of that sort could happen. We were not to worry. The experts would not permit an accident to happen. We have since learned that such assurances do not amount to much.

We make mistakes. We kill our own.

This is the century of Hitler and Stalin, evidence -- if any were needed -- that madmen can seize the reins of power of modern industrial states. If we are content in a world with nearly 60,000 nuclear weapons, we are betting our lives on the proposition that no present or future leaders, military or civilian -- of the United States, the Soviet Union, Britain, France, China, Israel, India, Pakistan, South Africa, and whatever other nuclear powers there will be -- will ever stray from the strictest standards of prudence. We are gambling on their sanity and sobriety even in times of great personal and national crisis -- all of them, for all times to come. I say this is asking too much of us. Because we make mistakes. We kill our own.

The nuclear arms race and the attendant Cold War cost something. They don't come free. Apart from the immense diversion of fiscal and intellectual resources away from the civilian economy, apart from the psychic cost of living out our lives under the Damoclean sword, what has been the price of the Cold War?

The American cost we can readily tabulate. (The Soviet cost is, very likely, about the same.) By the time the Reagan Administration leaves office in January, 1989, how much will the United States have spent on the Cold War? The answer, in current dollars, is about \$10 trillion. That's the one with the big "T"; ten trillion dollars. Of this sum, more than a third has been

spent by the Reagan Administration, which has added more to the national debt than all previous administrations combined, back to the presidency of George Washington.

How much could you buy for \$10 trillion? The answer is -- everything. You could buy everything in the United States, except the land. Everything. All the houses, airplanes, factories, skyscrapers, highways, railroads, stores, homes, food, clothing, medicine, furniture, toys, games, baby's diapers. . . . Everything in the United States but the land could be bought for what we have spent on the Cold War. A business that spent its capital so recklessly and with so little effect, would have been bankrupt long ago. Executives who could not recognize so clear a failure of corporate policy would long before now have been dismissed by the stockholders.

What else could the United States have done with that money (not all of it, because prudent defense is, of course, necessary, but with some fraction of it; a third or a quarter, something like that)? We could have made major progress toward eliminating hunger, homelessness, infectious disease, illiteracy, ignorance, poverty -- not just in the United States, but worldwide. We could have helped make the planet agriculturally self-sufficient and removed many of the causes of violence and war, and this could have been done with enormous benefit to the American economy. Think what prodigies of human inventiveness in art, architecture, medicine, science, and technology could have been

supported for decades with the tiniest fraction of that money, and how they could have enriched our lives.

We have made a fool's bargain. We have been locked in a deadly embrace with the Soviet Union, each side always propelled by the abundant malefactions of the other; almost always looking to the short term -- to the next congressional or presidential election, to the next Party Congress -- and almost never seeing the big picture.

Dwight Eisenhower, who was closely associated with this Gettysburg community, said "The problem in defense spending is to figure out how far you should go without destroying from within what you are trying to defend from without." I say we have gone too far.

How do we get out of this mess? A Comprehensive Test Ban Treaty would stop all future nuclear weapons tests; they are the chief technological driver that propels, on both sides, the nuclear arms race. We need to abandon the ruinously expensive notion of Star Wars, which cannot protect the civilian population from nuclear war and subtracts from, not adds to, the national security of the United States. If we want to enhance deterrence, there are far better ways to do it. We need to make safe, massive, bilateral, intrusively inspected reductions in the strategic and tactical nuclear arsenals of the United States, the Soviet Union and all other nations. (The INF Treaty represents a tiny step, but in the right direction.) That's what we should be

doing.

Because nuclear weapons are comparatively cheap, the big ticket item has always been, and remains, conventional military forces. An extraordinary opportunity is now before us. Something no one had anticipated, something approaching a miracle has happened in the Soviet Union. There is somebody in charge there, somebody not just more reasonable than any Soviet leader in recent memory, somebody not just smart, but somebody with a long-term vision, with concern for precisely the same problems in his nation that we should be concerned for in ours. There is a clear commonality of purpose. Mr. Gorbachev has proposed massive conventional force reductions in Europe; he's willing, he says, to do it asymmetrically, in which the Soviets reduce their forces more than the Americans do. I say such conventional force reduction is in the interest of peace, and in the interest of a sane and healthy American economy. We ought to meet him halfway.

The world today spends \$1 trillion a year on military preparations, most of it on conventional arms. The United States and the Soviet Union are the leading arms merchants. Much of that money is spent only because the nations of the world are unable to take the unbearable step of reconciliation with their adversaries. That trillion dollars a year takes food from the mouths of poor people. It cripples potentially effective economies. It is a scandalous waste, and we should not countenance it.

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It is time to learn from those who fell here. And it is time to act.

In part the American Civil War was about freedom; about extending the benefits of the American Revolution to all Americans, to make valid for everyone that tragically unfulfilled promise of "liberty and justice for all." I'm concerned about a lack of historical pattern recognition. Today the fighters for freedom do not wear three-cornered hats and play the fife and drum. They come in other costumes. They may speak other languages. They may adhere to other religions. The color of their skin may be different. But the creed of liberty means nothing if it is only our own liberty that excites us. People elsewhere are crying, "No taxation without representation," and in Southern Africa, or the West Bank of the Jordan River, or Eastern Europe, or Central America they are shouting in increasing numbers, "Give me liberty or give me death." Why are we unable to hear most of them? We Americans have powerful non-violent means of persuasion available to us. Why are we not using these means?

The Civil War was mainly about union; union in the face of differences. A million years ago, there were no nations on the planet. There were no tribes. The humans who were here were divided into small family groups of a few dozen people each. They wandered. That was the horizon of our identification, an itinerant family group. Since then, the horizons have expanded.

From a handful of hunter-gatherers, to a tribe, to a horde, to a small city-state, to a nation, and today to immense nation-states. The average person on the Earth today owes his or her primary allegiance to a group of something like 100 million people. It seems very clear that if we do not destroy ourselves first, the unit of primary identification of most human beings will before long be the planet Earth and the human species. To my mind, this raises the key question: whether the fundamental unit of identification will expand to embrace the planet and the species, or whether we will destroy ourselves first. I'm afraid it's going to be very close.

The identification horizons were broadened in this place 125 years ago, and at great cost to North and South, to blacks and whites. But we recognize that expansion of identification horizons as just. Today there is an urgent, practical necessity to work together on arms control, on the world economy, on the global environment. It is clear that the nations of the world now can only rise and fall together. It is not a question of one nation winning at the expense of another. We must all help one another or all perish together.

On occasions like this it is customary to quote homilies; phrases by great men and women that we've all heard before. We hear, but we tend not to focus. Let me mention one, a phrase that was uttered not far from this spot by Abraham Lincoln: "With malice toward none, with charity for all . . ." Think of what that means. This is what is expected of us, not merely

because our ethics command it, or because our religions preach it, but because it is necessary for human survival.

Here's another: "A house divided against itself cannot stand." Let me vary it a little: A species divided against itself cannot stand. A planet divided against itself cannot stand. And [to be] inscribed on this Eternal Light Peace Memorial, which is about to be rekindled and rededicated, is a stirring phrase: "A World United in the Search for Peace."

The real triumph of Gettysburg was not, I think, in 1863 but in 1913, when the surviving veterans, the remnants of the adversary forces, the Blue and the Gray, met in celebration and solemn memorial. It had been the war that set brother against brother, and when the time came to remember, on the fiftieth anniversary of the battle, the survivors fell, sobbing, into one another's arms. They could not help themselves.

It is time now for us to emulate them -- NATO and the Warsaw Pact, Israelis and Palestinians, whites and blacks, Americans and Iranians, the developed and the underdeveloped worlds.

We need more than anniversary sentimentalism and holiday piety and patriotism. Where necessary, we must confront and challenge the conventional wisdom. It is time to learn from those who fell here. Our challenge is to reconcile, not after the carnage and the mass murder, but instead of the carnage and the mass murder.

It is time to act.