Precision Aero space Power, Discrimination, and the Future of War

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During Operation Allied Force over Kosovo, there were some observers who questioned the tactics of NATO airmen. No less worthy than Senator John McCain, a fighter pilot himself during Vietnam, wondered aloud as to the morality of flying and bombing above 15,000 feet. McCain and others were concerned that bombing from that altitude, where it was 'safe,' was inherently less accurate and therefore less humane than if the aircraft had gone lower. [1] These critics were wrong. In the vast majority of cases, NATO airmen flew at the optimum altitude for achieving accuracy, while also fulfilling NATO political demands to avoid risk.

It is the thesis of this essay that air warfare over the past decade has significantly humanized war – if such a phenomenon is possible. Tremendous technological strides in the use of precision weapons, as well as developments in air and space intelligence gathering tools, have made it far easier to discriminate between military and civilian targets, and then effectively strike those military targets. Moreover, such effectiveness has been accomplished with a marked reduction in risk to the attackers. In short, modern air warfare has reduced casualties among both the attackers and the attacked, thus making it an increasingly efficient, effective and humane tool of American foreign policy.

It is true that General Wesley Clark, the NATO commander, directed the airmen to take all precautions to limit friendly losses. Clark realized that the fragility of the NATO alliance during Allied Force necessitated such risk avoidance. Enemy missiles, anti-aircraft artillery and small arms fire can be extremely deadly at low altitude. As a consequence, strike aircraft were directed to stay above 15,000 feet when deploying their weapons. An important question is whether or not this significantly and adversely impacted accuracy. In the vast majority of cases it did not. A brief discussion of new air weapons and their characteristics is necessary.

Precision guided munitions (PGMs) are air-launched weapons that have improved accuracy by orders of magnitude. These weapons are equipped with adjustable fins that allow them to alter course in flight and home-in on their targets. PGMs have several different types of guidance systems – laser homing, inertial, optical or infrared imaging, or the use of GPS (global positioning system) satellite signals. These various guidance systems have strengths and weaknesses: for example, laser guided bombs are highly accurate, but because lasers cannot penetrate clouds, they are unusable when bad weather obscures the target. The most successful new PGMs employed over Kosovo were those using GPS guidance. These are relatively inexpensive but highly accurate weapons that in some cases allow a standoff capability – they can be launched several miles from the target – thereby lowering the risk to the delivery aircraft and crew. Perfect accuracy is not guaranteed – failure of the guidance system, aircraft equipment, or aircrew error means that accidents still happen – but current PGMs have an accuracy that is usually measured in feet.

Although used in Vietnam, PGMs truly came into their own during the Persian Gulf War of 1991. The cockpit videos detailing the accuracy of these weapons were shown continually on television and have become one of the defining images of that war: bombs were seen going down chimneys, through doors, and into specific windows. ‘Airshaft accuracy’ had become so seemingly routine it was now expected. When American aircraft struck Serbian targets in Bosnia in 1995 and Serbia/Kosovo in 1999, PGMs were used almost exclusively in populated areas. Once again, the accuracy of these weapons was extraordinary. Visitors to Serbia were amazed to see radio towers neatly separated from their concrete bases and toppled, while civilian buildings not more than 50 feet away were untouched. In another instance a Serbian defense facility was razed, while buildings on either side were largely unscathed.

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There were mistakes, but the relatively small number of such errors was remarkable. Human Rights Watch states that there were 90 instances during Allied Force when attacking NATO aircraft caused civilian casualties and collateral damage.[2] Most of these occurred in well-reported accidents where bombs went astray or targets were misidentified. For example, in one instance, aircrews were given the wrong target, which they nevertheless precisely hit – the Chinese embassy. In another case, the guidance system of a PGM dropped on an airfield failed, and the bomb landed in a residential area several hundred yards away. On another occasion, an aircraft attacked a bridge just as a passenger train unexpectedly passed over it. It is important to remember that these accidents were relatively infrequent given the number of strikes flown (14,000) and munitions dropped (28,000). It was essential for NATO solidarity that such precision was possible. Moreover, given that several NATO countries had already stated their opposition to a ground assault, it is probable that without a precision air campaign, there would have been no NATO military response whatsoever to Serb ethnic cleansing operations. Even the Serbs themselves realized the extreme accuracy and carefulness of the air campaign. Hence, Belgrade citizens wore shirts with targets painted on them and held rallies on bridges over the Danube – secure in the knowledge that the NATO airstrikes were so precise and so discriminate that they would never have to pay for such foolishness. The charge that dropping these weapons from 15,000 feet was somehow inappropriate simply does not stand up under scrutiny.

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For a PGM, maximum accuracy is achieved if it is dropped in the mid-altitude range – from 15,000 to 23,000 feet. This allows enough time for the weapon to correct itself in flight and hit its designated target as close to a bull's eye as possible. If dropped from a lower altitude, the weapon's steering fins will have less opportunity to correct the aim, and the weapon will be less accurate. From the pilot's perspective, this altitude range is also the most desirable if attacking a fixed or pre-planned target. The middle altitudes allow time to identify the target at sufficient distance, 'designate it' (if laser guided), and launch the weapon. In short, for PGMs against a fixed target whose position is already established – which was the case in most of the targets struck in Serbia – the optimum altitude to ensure accuracy is at or above 15,000 feet.

Non-guided munitions – 'dumb bombs' – are inherently less precise than their more intelligent brothers, so their optimum drop altitude is lower than that of a PGM. Even so, acquisition remains a limiting factor – coming in too low makes it nearly impossible to acquire the target, line up, and put the bomb on target. One can imagine how difficult such target acquisition is for a pilot roaring in at 500 feet and 500 knots. At that speed and altitude the pilot generally has his hands full just trying to avoid impacting the ground. As a result, the compromise altitude for the delivery of unguided bombs is around 5,000 feet. This,

however, puts the delivery aircraft right in the thick of fire from ground defenses. Allied Force air commanders resolved this dilemma by keeping aircraft at medium altitudes, but restricting the use of non-PGMs to areas where there was little or no chance there would be civilian casualties or collateral damage.

The difficulty arises when attacking mobile or transitory targets. In such cases the key factor becomes target identification. Is the column below comprised of military or civilian vehicles; if both, which are which? At medium altitudes it is difficult to make such a determination. In this situation, to protect against misidentification it is best to have someone closer to the target. This can be done by a FAC (forward air controller), an aircraft that generally operates at lower altitudes, a UAV (unmanned air vehicle) which is also at a lower altitude and that can relay the video it takes of the suspected target to an analyst that can rapidly determine its identity and relay that information to the airborne aircraft, or spotters on the ground. Once the determination is made by one of these sources, strike aircraft can attack from the optimal altitude.

Problems arose when aircraft at 15,000 feet saw what appeared to be military forces below, but with no FAC, UAV or ground spotters available. In such instances, given the strictures against both civilian casualties and taking casualties themselves, aircrews were in a quandary: they could not positively identify the target and were restrained from going lower to do so. Usually, the pilots elected not to drop their bombs.

There were exceptions. On 14 April 1999 near Djakovica, Kosovo, NATO pilots attacked what intelligence sources had identified and which indeed appeared to be a military column. It is now known the column also contained refugees: as many as 73 civilians were killed in the airstrikes.[3] This is the only known instance in the 78-day air campaign where NATO intelligence sources and aircraft at medium altitude combined to misidentify a target, thereby causing civilian casualties.

Lockheed U-2 high-altitude reconnaissance aircraft.

Could this accident have been avoided if the aircraft had been flying lower? Probably. Indeed, NATO changed the rules after this, allowing aircraft in certain circumstances to fly lower to ensure target identification. There is a tradeoff in such instances. Flying lower increases the risk to aircrews due to enemy ground fire, so at what point does the risk of misidentifying a target override the risk of losing a plane and its crew? The Law of Armed Conflict states that an attacker does ‘everything feasible’ to avoid harming civilians or non-military targets. ‘Feasible’ is a highly subjective term. Were friendly losses feasible if it meant the shattering of the Alliance, which would have allowed Milosevic to continue his atrocities unchecked?

What has tied together these new weapons to make them so effective is an intelligence, communications, and geo-locating network that relies on assets positioned in space, the air and on the ground. Satellites collect imaging data, relay

communications and provide precise geographic updates; airborne sensors do much the same tasks from closer in, while also providing more flexibility for short notice operations. Personnel on the ground and in the air receive, analyze, and disseminate the information gathered, while commanders at all levels use it to lead their forces. Over Kosovo, for example, a U-2 flying over a suspected target took video and relayed that video via satellite back to the US. There, analysts determined that the objects captured on film were Serb military vehicles. This information was then fused with three-dimensional terrain data and satellite imagery taken earlier to generate precise geographic coordinates. These coordinates were relayed via satellite to orbiting command and control aircraft, which directed an airborne F-15E strike aircraft to attack. The F-15, using PGMs employing GPS, then knocked out the targets. All of this took place in minutes. As little as one decade ago such an operation would have been considered a pipe dream.

The employment of these new technologies and tactics came together over the Balkans. Allied Force was a unique event because of its almost total reliance on aerospace power. Although the use of ground troops – or even the threat of their use – would have been very helpful in bringing pressure to bear on Serb leaders, NATO ruled out their use early in the crisis. The American public has become 'casualty averse' over the past two decades. Mercifully, few Americans died in Grenada, Panama and the Persian Gulf War, and such low losses have now become expected. Casualties, even few in number, are unacceptable. In October 1993, eighteen American soldiers were killed and their bodies dragged through the streets of Mogadishu, Somalia. The revulsion felt by the American people caused the government to withdraw our forces from Somalia.

Partly as a result of this concern over casualties, air forces bore the brunt of the NATO campaign. After 78 days of airstrikes, Mislosevic yielded and withdrew his military forces from Kosovo. More surprisingly perhaps, NATO suffered no casualties, while Serb losses were minimized through rigid procedures that governed the use of weapons, tactics, and the selection of targets. Today, what is often called 'the CNN factor' complicates the issue further and places even greater pressure on the commander.

In a sense, every bomb, missile or bullet fired by an American airman, soldier or sailor is a political act. When a bomb goes astray and hits a residential area, a Tomahawk missile crashes into a hotel lobby, or a sniper's bullet kills a pregnant woman getting water at a well, US *foreign* policy – not just military policy – suffers a setback. We can no longer afford to miss. More than that, even when we hit the target, we have to do so almost softly and

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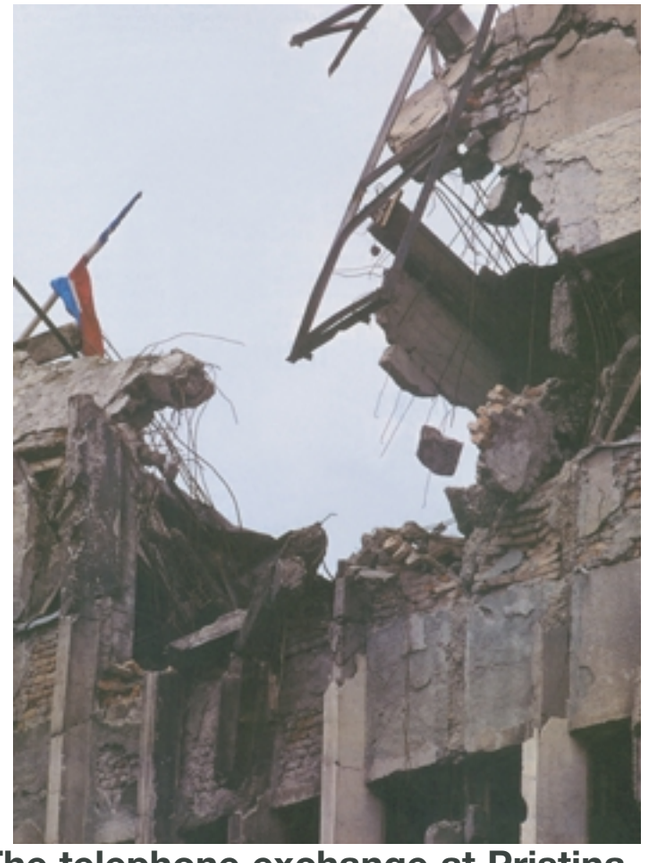

The telephone exchange at Pristina destroyed by a Laser guided bomb.

A USAF F-15E Strike Eagle with a full load of cluster bombs on wing and fuselage pylons.

The use of cluster bombs could be seen by some as an anomaly in the continual drive towards the precision employment of air weapons. A strong case can probably be made for the military efficacy and legality of cluster bombs, but that case has not yet been made, and it will have to made soon

with minimal impact.[4] One is reminded of the Western programs on television many years back: the good guy – the one in the white hat – never killed the bad guy; he shot the gun out of his hand and arrested him. That is our new standard.

There is, however, another issue that airmen have not adequately addressed, but which is germane to the subject of discrimination in war. Cluster bombs, which can be air-delivered, are weapons that deploy a large number of baseball-sized bomblets over a fairly wide area. Some cluster bombs dispense landmines, while others dispense anti-armor, anti-personnel, or simple fragmentation bomblets for use against structures, radar sites or runways. Some cluster bombs are precision weapons in their own right – the 'sensor fused weapon' consists of forty individually targeted bomblets that home in on the infrared signature of a vehicle. Others are deployed by a 'wind corrected munitions dispenser' that makes the cluster bomb canister accurate to within thirty feet. Still other cluster bombs have no precision guidance at all.

The problem: an estimated 5 percent of cluster bomblets fail to explode on impact, thus making them, essentially, anti-personnel landmines. International agencies are already jumping on this issue, and airmen should expect these groups to push for a ban on the use of cluster bombs.[5] Although a total prohibition would seem extreme, airmen must address this issue head-on. How many cluster bombs have been employed over the past decade and by whom; how effective have they been against their intended targets; what is their accuracy in actual operations; what percentage are duds; how easy are these duds to defuse after the conflict has ended; and how many noncombatants have been killed or injured by unexploded bomblets? These are all questions that airmen must answer. The use of cluster bombs could be seen by some as an anomaly in the continual drive towards the precision employment of air weapons. A strong case can probably be made for the military efficacy and legality of cluster bombs, but that case has not yet been made, and it will have to made soon.

Similarly, there has been a growing concern over the use of depleted uranium (DU) munitions. DU is an extremely hard substance that is ideal for the warheads on artillery shells or bullets that must penetrate the heavy steel used in armored vehicles. During the Persian Gulf War the US Army and Air Force expended nearly one million such munitions. In the aftermath of the war there was a concern that those rounds exposed military personnel and civilians to dangerous levels of radiation.

The shell fragments left behind could cause further problems for the indigenous populace. The situation was repeated in Allied Force when the Air Force's A-10 fighter-bomber expended thousands of rounds of DU-tipped 30mm cannon shells. It is not clear how much damage these shells present to the Serbian/Kosovar populations.[6] Nonetheless, this is another area that airmen must examine to determine if there is a better way to perform the mission of killing enemy armored vehicles. If the price for killing enemy tanks is to poison the battlefield, than that price is too high.

Despite these two exceptions, it is clear that airmen have made great efforts to limit civilian casualties and collateral damage over the past decade. Yet, concerns are still raised regarding the humanity of air warfare. In one sense, the drive to limit the suffering of noncombatants and structures is highly commendable. In another sense, however, the calls for greater accuracy, greater discrimination, and greater restraint in air operations are puzzling when it is realized that traditional forms of war are far more deadly, especially to noncombatants, than is modern air war. Yet, there is little debate on how best to control these other forms of war.

Wars have always been harmful to noncombatants. Over the centuries, however, various attempts have been made to shield them from harm through the promulgation of various laws, treaties, conventions and protocols. On paper, these attempts look satisfying and noble; reality is another matter. Paradoxically, as legal activities to soften war's effects have accelerated, the numbers of civilian noncombatants killed have increased dramatically.

Well over 100 million people died in wars during the twentieth century – the bloodiest in history. One source claims that 110 million people died in just the first seven decades of the century: 62 million perished as a result of genocide or starvation caused by blockade and siege; 24 million were killed by small arms; 17 million by artillery and naval gunfire; and 2 million due to air attack.[7] These statistics, horrible as they are, do not include several million more deaths in Cambodia, Afghanistan, the Iran-Iraq War, Angola, Rwanda, Chechnya, and the Balkans. The vast majority of all those killed were noncombatants. These statistics indicate that the principle of noncombatant immunity is at best a goal we have striven unsuccessfully to achieve, but at worst is a myth that hides the truth. Innocent people have always suffered the most in war, especially in the traditional forms of land and sea warfare. On the Eastern Front in World War II, it is estimated that 10 million Soviet civilians were killed through starvation, artillery barrage, and gunfire; air attack was a negligible factor in piling up that horrendous death count. In fact, in all the wars of the twentieth century and all the tens of millions of noncombatants who have been killed, a tiny percentage, perhaps 2 percent, have died as a result of air attack.

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Sieges, artillery bombardments and ground campaigns have always been deadly. One of the more celebrated sieges of the past century was that of Leningrad during World War II. Over a period of nearly three years, German forces surrounded the city, attempted to starve it out, and pummeled it with artillery fire. In one of the more startling

incidents of the siege, the Soviet garrison commander attempted to allow the civilians trapped within the fortress city to escape. He called upon the German commander, Field Marshal Wilhelm von Leeb, to cease firing while the civilians departed. Von Leeb refused and ordered his troops to fire on the defenseless civilians if they tried to escape. Many did try to flee and were consequently slaughtered. At Nuremburg von Leeb was tried as a war criminal for this incident, but he claimed his actions were permissible under the laws of war. He was acquitted.[8] Over 1 million Russian civilians – allegedly protected by their noncombatant immunity – died during the siege of Leningrad.[9] The sieges of the past decade at Sarajevo and Grozny in Chechnya have shown once again the devastation and deadliness of such operations. Recent instances of ground operations that have resulted in hundreds of civilian deaths are the invasion of Panama and the failed effort in Somalia.

Another pervasive and indiscriminate killer is the landmine. In 1993 experts estimated that as many as 100 million unexploded landmines were scattered throughout 62 countries. The US State Department estimated that landmines killed or wounded more than 150 people per week worldwide. The American Red Cross thought that estimate was low, and that 200 people were killed each week and another 100 or so were wounded.[10] Both agreed that the majority of those killed and wounded were civilians.

KFOR troops clearing mines, where earlier a French light armoured vehicle had been destroyed.

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Virtually all belligerents use landmines. In the Persian Gulf War, for example, the US and its allies laid approximately 1 million mines along the Iraq-Kuwait border.[11] Millions more have been sown in South Korea along the border with the North. Although the purpose of these mines is defensive, these ‘eternal sentinels’ are unable to establish friend from foe. Once a war is over, the mines often remain, posing a huge danger to the local populace. Worse, removing mines is not an easy task: besides the risk, it costs nearly $1,000 to remove a mine that costs a fraction of that amount to plant.[12] Traditional war by sea has also been deadly to innocents.

Clausewitz was wrong. War does not, necessarily, have to be ‘an act of violence.’ For centuries the weapons of war have included the seemingly benign operations of naval blockades and sanctions. Their purpose is to induce suffering in a target

country or region. Cutting off trade, food and raw materials is expected to correspondingly lower the standard of living among the populace, thus causing unrest. When unrest grows to a certain level, the populace will, hopefully, move against its government and leaders to force a change of policy that will convince those imposing the blockade or sanctions to lift them. As Vice President Al Gore stated it succinctly in the presidential debate of 3 October 2000: 'the people of Serbia know that they can escape all these sanctions if this guy [Milosevic] is turned out of power.' Unfortunately, this can be a slow, laborious and very deadly process. For example, according to the British official history, over 750,000 German civilians died as a direct result of the Allied starvation blockade of World War I. The Germans contend the figure was much higher, but in any event, it does not include those civilians who died in Austria-Hungary, Bulgaria and Turkey – German allies who were also under blockade.[13]

USS George Washington assisting the enforcement of sanctions against Iraq, in the Arabian Gulf.

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More recently, the Organization of American States (OAS) in 1991, and then the United Nations (UN) in 1993, imposed sanctions on Haiti in the aftermath of a military coup that drove President Jean-Bertrand Aristide from office. It was believed that the use of military force to restore Aristide was too extreme an option, because it would cause excessive bloodshed and suffering. The goals of the OAS and the UN in imposing sanctions instead were eminently noble: to induce the military junta to step down and restore democracy to Haiti. However, even supporters of the sanctions admit that the Junta and its inner circle 'not only survived but prospered' during the embargo. As a consequence, the price for this supposedly humane action was paid for by the Haitian population. Unemployment soared to 70 percent, the Gross Domestic Product plummeted, and the inflation rate climbed to 50 percent. A 1993 study conducted by the Harvard Center for Population and Development Studies found that the sanctions were killing 1,000 children per month.[14]

An even worse example of how seemingly non-violent weapons of war can be incredibly deadly is currently taking place in Iraq. Since the end of the Persian Gulf War several reports have detailed the severe suffering of the Iraqi populace as a result of the UN embargo. Although the Geneva Conventions specifically prohibit the use of food deprivation as a weapon, the UN nonetheless imposed just such restrictions. Agriculture seed to grow crops, farm machinery, and over 41/2 million tons of food ordered by Iraq were turned back by the naval fleet enforcing the embargo. Between 6 August 1990 and mid-March 1991 no food was allowed into Iraq. As a consequence, the Harvard Study Group that visited Iraq in 1991 estimated that as many as 50,000 children with leukemia, diabetes, asthma, heart disease and other ailments died.[15] The outrage in the world community over this situation was so great that the UN lifted the embargo on food and medicine and instituted the 'oil for food' program that allows Iraq to sell some of its oil and use the proceeds to buy food, medicine, and other necessities.[16] The results of this easing of the embargo have not been overly successful.

In March 1996 the World Health Organization published a report on conditions in Iraq. Comparing the levels of infant mortality rates in 1996 with those before the war, it found that infant mortality rates had doubled, and the rate for children under the age of five had increased six-fold.[17] It concluded that the shortage of food and medicine were directly attributable to '*financial constraints* as a result of the sanctions [which] have prevented the necessary import of food and medicine.'[18] These findings were confirmed three years later when UNICEF visited Iraq and noted that statistics showed there had been a steady and continual decline in mortality rates between 1960 and 1990 – despite the oppressive dictatorship of Saddam Hussein, the Iraqi people were getting healthier as the economy grew. The war and subsequent UN embargo changed everything. The under-five year old mortality rate jumped from 50 per thousand live births in 1980 to 117 per thousand by 1995. By 1999 it had climbed further to 125 deaths per thousand. UNICEF concluded that if the mortality rates of the 1980s had been continued through the 1990s, 'there would have been half a million fewer deaths of children under five in the country as a whole during the eight year period 1991 to 1998.'[19]

Sanctions, embargoes and blockades are not a 'clean' option, and they do indeed cause very real levels of human suffering to the weakest members of a target society

This is a staggering statistic. The UN has admitted that one-half million infants have died as a direct result of their own embargo on Iraq. When this statistic is compared to the total of 2,300 civilians that Iraq claims were killed during the six-week air campaign in 1991, the disconnect between perceptions of what constitutes humanity and discrimination in war becomes glaring. When we conduct military operations that cause such enormous death and suffering, we have lost the moral high ground.

A great deal of ink has been spilled on the subject of whether or not sanctions and embargoes have succeeded in their purpose of forcing a change in behavior of the target leadership. The results are contradictory.[20] In truth, however, the question

of whether or not sanctions and embargoes ‘work’ misses the point. A more relevant question would be: ‘do the ends justify the means?’ Sanctions, embargoes and blockades are not a ‘clean’ option, and they do indeed cause very real levels of human suffering to the weakest members of a target society. That suffering must be factored into the costs when evaluating different courses of action.

There is a wealth of empirical data over the past several centuries to show that blockades, embargoes, sanctions and sieges almost always have a percolating effect: they start killing at the bottom levels of society and slowly work their way upwards. The three-quarters of a million German civilians who died as a result of the starvation blockade in World War I were not the soldiers, politicians or factory workers – the productive members of the war society. Instead, the first to die were the old, the young, and the sick. Eventually, and only very slowly, did the effects begin reaching the upper levels of society. This has certainly been the case in Iraq and Haiti. It is not Saddam and his generals who are going to bed without their supper. It is essential that we remember this fact, because it refutes the argument that a blockade, embargo or sanction is imposed as a bloodless and humane way of coercing the leaders of a target country.

Many have argued that such suffering is actually the fault of the country’s leaders who refuse to give in to the demands of the imposer or who hoard food and medicine for themselves.[21] History demonstrates, however, that dictators who are the subject of an embargo generally react by attempting to win the war or conflict in which they are engaged. They will accept casualties to achieve their objectives, and when attacked they will attempt to protect those things most valuable to their society that allows them to continue the fight. They will sacrifice – reluctantly perhaps, but they will nonetheless sacrifice – their weakest segments of society so that the strong can fight on. Nations at war for their survival (or the survival of their leader) don’t generally take a ‘women and children to the lifeboats first’ mentality. They cannot afford to do so. We must understand this. Thus, if we know from dozens of cases over several centuries what the result of our actions will probably be when we embargo Iraq or Serbia or Haiti, then we cannot say afterwards that we didn’t know the gun was loaded.

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There is an alternative. During the past decade the world has seen air war conducted with humanity, precision and low risk – to both sides. It has been instrumental in achieving the political objectives of our leaders. Military force is not a pleasant option or one that should be employed lightly, but if it is necessary, we should do more than simply follow the letter of the law, we should limit as much as possible the harm to civilian noncombatants. Aerospace power should therefore be our weapon of first resort, because it is the most discriminate, prudent and risk-free weapon in our arsenal.

1 Over 700 surface-to-air missiles were launched at NATO aircraft, as well as tens of thousands of anti-aircraft artillery shells. Two NATO aircraft were shot down, but the pilots were recovered.

2 Human Rights Watch, 'Civilian Deaths in the NATO Air Campaign,' Feb 7, 2000, 5. HRW investigators actually visited only 42 of the 90 sites of the alleged civilian casualties.

3 Ibid., 12-13.

4 During Operation Northern Watch over Iraq, US aircraft sometimes dropped bombs with concrete warheads to further limit the amount of damage caused in sensitive areas.

5 International Committee of the Red Cross, '2001 Review Conference of the United Nations Convention on Certain Conventional Weapons,' 14 Dec 2000, pp 1-2.

6 Bill Mesler, 'Pentagon Poison: The Great Radioactive Ammo Cover-Up,' *The Nation*, 5 May 1997; Scott Peterson, 'Aftershocks from Anti-Tank Shells,' *Christian Science Monitor*, 9 Jan 2001, p 1.

7 Gil Elliot, *Twentieth Century Book of the Dead* (NY: Scribner's, 1972), 125, 132-36, 232-34. In another such estimate, William Eckhardt, *Civilizations, Empires and War: A Quantitative History of War* (Jefferson, NC: McFarland, 1992), 273, states that between 1900 and 1989 there were approximately 111 million deaths due to war; he does not break down cause of death as does Elliot. *The Black Book of Communism: Crimes, Terror, Repression*, by Stéphane Courtois et.al. (Cambridge: Harvard University Press, 2000) states that fully 95 million people died at the hands of communist regimes in China, the Soviet Union, Vietnam, North Korea, etc. during the past century. This incredible statistic excludes those killed in those countries during inter-state wars.

8 Michael Walzer, *Just and Unjust Wars* (NY: Basic Books, 1977), 166-67. The actual judgment of the court can be found in Volume XI of *Trials of War Criminals before the Nuremberg Military Tribunals* (Washington: Government Printing Office, 1950), 563. Of note, the current US Army field manual on the law of war confirms the legality of this practice: 'Thus, if a commander of a besieged place expels the noncombatants in order to lessen the logistical burden he has to bear, it is lawful, though an extreme measure, to drive them back, so as to hasten the surrender.' US Army, FM 27-10, The Law of Land Warfare, Jul 1956 (Change 1, Jul 1976), 20.

9 Harrison Salisbury, *The 900 Days: The Siege of Leningrad* (NY: Harper & Row, 1969), 514-16.

10 Human Rights Watch, *Landmines: A Deadly Legacy* (NY: Human Rights Watch, 1993), 3-4.

11 UNICEF, *The State of the World's Children* (NY: Oxford University Press, 1996), 26.

12 Since the Mine Ban Treaty was signed in 1997, things have improved, but thousands of casualties still occur worldwide each year. Human Rights Watch, *Landmine Monitor Report* (NY: HRW, Sep 2000). Of note, the three largest producers of landmines – Russia, China and the US – have not ratified the treaty.

13 A.C. Bell, *A History of the Blockade of Germany, 1914-1918* (London: His Majesty's Stationery Office, 1937), 672. The eminent British naval historian, Admiral Sir Herbert Richmond, was unequivocally blunt regarding the purpose of the blockade: 'what we have to do is to starve & cripple Germany, to destroy Germany. That is our prime object.' Arthur J. Marder (ed.) *Portrait of an Admiral: The Life and Papers of Sir Herbert Richmond* (Cambridge: Harvard University Press, 1952), 219-20.

14 David Weekman, 'Sanctions: The Invisible Hand of Statecraft,' *Strategic Review*, 26 (Winter 1998): 40.

15 Eric Hoskins, 'Pity the Children of Iraq,' *Middle East International,* 24 Jan 1992, pp 16-17. Dr Hoskins was the medical coordinator of the Harvard Study Group that visited Iraq in 1991. See also Alberto Ascherio, 'Effect of the Gulf War on Infant and Child Mortality in Iraq,' *New England Journal of Medicine*, 327 (24 Sep1992): 931-36.

16 Even with the easing of the sanctions there were some bizarre aspects: syringes were initially prohibited, as were plastic bags for transfusions, chlorine for water treatment and even chemical fertilizer, because they could be used for military purposes. John Mueller and Karl Mueller, 'Sanctions of Mass Destruction,' *Foreign Affairs,* 78 (May/Jun 1999): 43-50.

17 World Health Organization, 'The Health Conditions of the Population in Iraq since the Gulf Crisis,' Mar 1996, p 6.

18 Ibid., p 16. Emphasis in original.

19 UNICEF, 'Child Mortality: Iraq, the Current Situation,' Aug 27, 1999, www.unicef.org/reseval/cmrirq.html.

20 For a good overview of when and how sanctions do or do not work, which includes a review of the literature on the subject, see T. Clifton Morgan and Valerie L. Schwebach, 'Fools Suffer Gladly: The Use of Economic Sanctions in International Crises,' *International Studies Quarterly*, 41 (March 1997): 27-50. This article notes that in some cases, sanctions are imposed for purely domestic political reasons: the need to show a restive populace that *something* is being done.

21 Claudette Antoine Werleigh, 'Haiti and the Halfhearted,' *Bulletin of the Atomic Scientists*, Nov 1993, pp 20-23; Jesse Helms, 'What Sanctions Epidemic?' *Foreign Affairs*, 78 (Jan/Feb1999): 2-8.

Globemaster III, C-17 in Royal Air Force colours. Operated extensively by the USAF the aircraft can transport a variety of heavy lift equipment including the Main Battle Tank.