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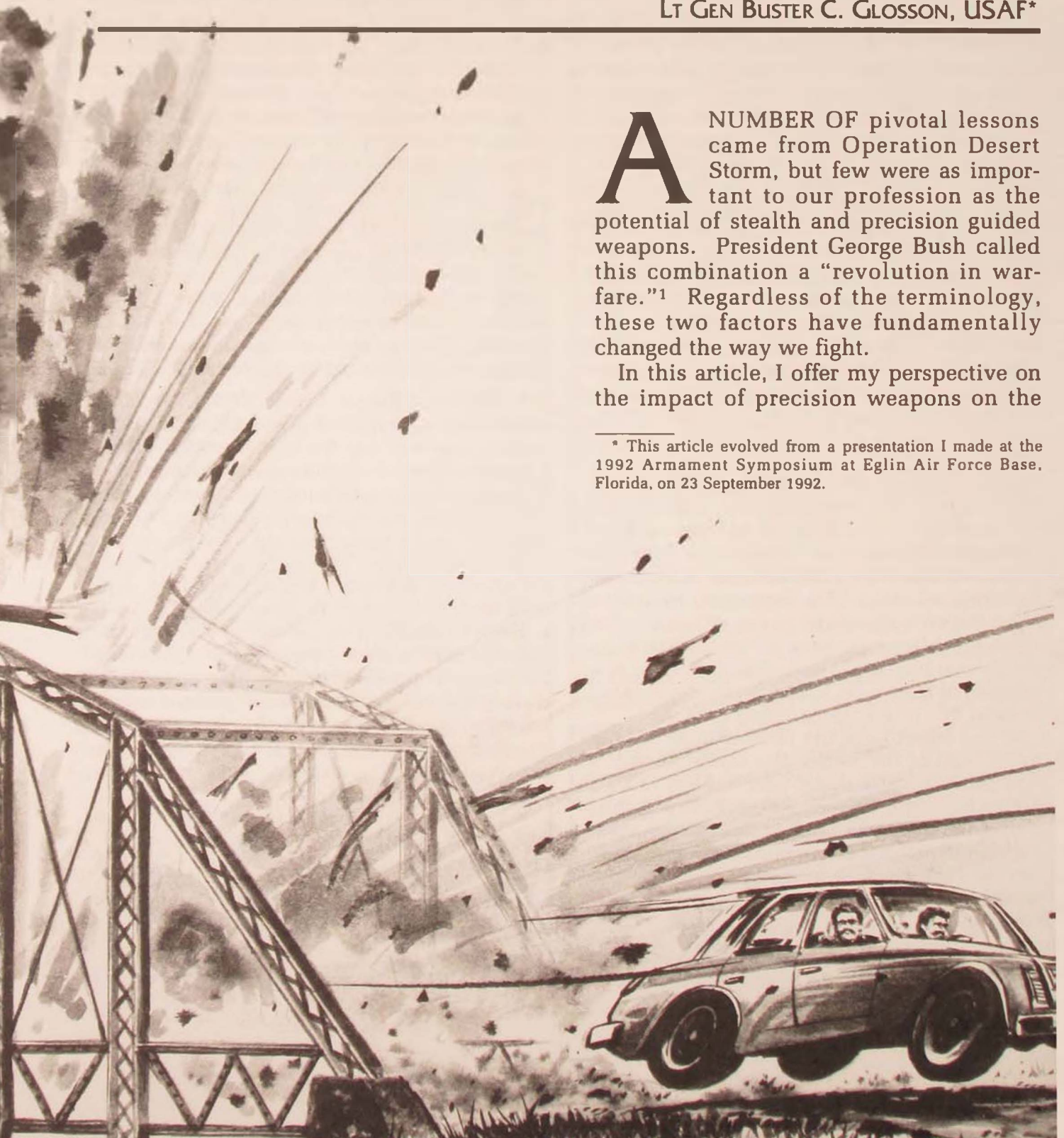
IMPACT OF PRECISION WEAPONS ON AIR COMBAT OPERATIONS

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A NUMBER OF pivotal lessons came from Operation Desert Storm, but few were as important to our profession as the potential of stealth and precision guided weapons. President George Bush called this combination a "revolution in warfare."¹ Regardless of the terminology, these two factors have fundamentally changed the way we fight.

In this article, I offer my perspective on the impact of precision weapons on the

* This article evolved from a presentation I made at the 1992 Armament Symposium at Eglin Air Force Base, Florida, on 23 September 1992.



future of air combat operations and briefly discuss some other technologies that I believe will be critical to our success in the next conflict. Although stealth and precision weapons are not perfect, they maximize our combat capability by permitting us to hold any target in a country at risk while minimizing the costs—both in lives and dollars.

We are writing a new and exciting chapter on air power—a chapter made possible in part by precision guided munitions (PGM). Air power advocates have long dreamed of a day when the weapon, platform, and willingness to use them properly would come together to make air power a decisive force. Today, those dreams are reality. One need only look back to our raids on Schweinfurt, Germany, in World War II to see how dramatically precision weapons have enhanced our capabilities over the last 50 years. Two raids of 300 B-17 bombers could not achieve with 3,000 bombs what two F-117s can do with only four. Precision weapons have truly given a new meaning to the term *mass*.

To shut down an industry in World War II, we were forced to target entire complexes because of the inaccuracy of our weapons; today we would need to hit only a couple of key buildings. What we historically achieved with volume we now can accomplish with precision. After all, the objective has never been to see how many bombs we could drop, but to produce results.

Precision weapons may also constitute a revolution in mobility. Of the 85,000 tons of bombs used in the Gulf War, only 8,000

tons (less than 10 percent) were PGMs, yet they accounted for nearly 75 percent of the damage. If we had wanted to, we could have airlifted all of our PGMs with just five C-5s or nine C-141s a day.²

Along with increasing our combat capability, PGMs reduce the human costs of war. No one who has ever sent airmen into combat relishes the idea of their loitering over hostile territory dodging surface-to-air missiles or enemy airplanes in order to deliver their bombloads. Each Schweinfurt raid placed 3,000 airmen in harm's way. Today, we can do the same job with just two airmen. If that is not meaningful to you, then stop reading!

The fact is that few weapons deliver so much for so little. Everyone remembers the startling video of the GBU-27 as it guided in on the communications building in downtown Baghdad.³ At \$69,000 a copy, that bomb might seem expensive, but—compared to the multimillion-dollar telephone switching center it destroyed on the first night of Desert Storm and the disruption it caused the Iraqi high command—it was a real bargain. Tank plinking is another example. Expending a single 500-pound GBU-12 worth \$10,000 to destroy a \$1.5 million T-72 tank is not a bad return on our tax dollars.

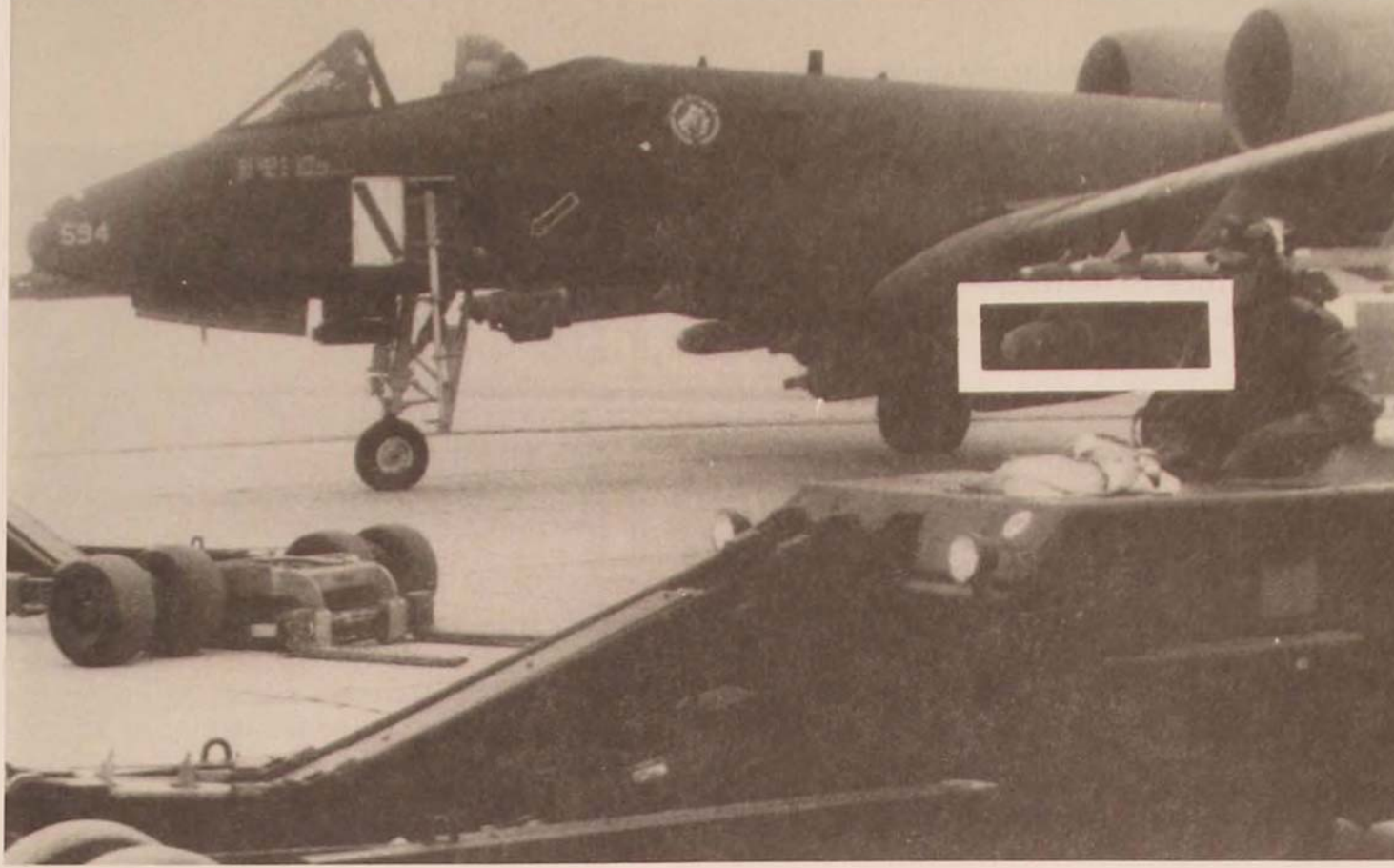
From my perspective, we have no higher priority than developing a hard-target penetrator and area-denial weapon that can be pickled at medium altitude in bad weather and strike a bridge, column of tanks on the move, or communications facility—all of which may be shrouded in fog. Further, our future PGMs must have a better probability of kill than the ones we have today. The Joint Direct Attack Munitions (JDAM) program is a step in the right direction. Its adverse weather capability and autonomous guidance system will allow a single B-2 to precisely destroy 16 separate targets on a single pass. The Joint StandOff Weapon (JSOW) is another accurate munition that promises devastating effects upon enemy armor in the field. Coupled with a Sensor Fuzed Weapon



The inaccuracy of World War II weapons meant that bombers had to fly multiple runs over industrial targets. Here, B-17s drop tons of bombs on a German electrostatic plant that produced hydrogen peroxide for explosives. Note the craters from previous attacks.

Although only 10 percent of the 90,000 tons of bombs used in the Gulf War were precision guided munitions, they accounted for 75 percent of the total damage. Below, members of a US Marine Corps bomb-dump crew spend their day assembling bombs in preparation for the aerial assault on Iraq.





Ready for tank plinking, an A-10 (top) stands uploaded and outfitted with a bevy of weapons, including two Maverick precision guided missiles (see box). These and other PGMs accounted for much of our success in the Gulf War, whether the target was an Iraqi tank (above left) or a key bridge (above right).

(SFW),⁴ JSOW could have stopped those two Iraqi Republican Guard armor divisions—the Hammurabi and Medinah—from bugging out prior to our ground forces making contact. As it was, poor weather and our lack of an all-weather PGM prevented coalition air forces from

destroying them. The fact that they survived proved to be particularly painful because Saddam later used these divisions in his bloody persecution of the Shiites.

Another compelling aspect of precision air warfare is its agreement with American values. Our country has developed a keen intolerance for casualties—even enemy casualties. The Gulf War served only to heighten this sensitivity. Incredible as it may seem, some critics have suggested that the US choose a form of warfare (other than aerial attack) that ensures

some measure of equality in losses.⁵ This idea is absurd, but it does indicate the sensitive nature of the casualty issue. Common sense tells us that any effort to reduce casualties—on either side—is a move in the right direction.



The Sensor Fuzed Weapon, ready to test-fire above, offers promise for the destruction of enemy armor. Results of testing appear below.



The option of strategically paralyzing an enemy with precision munitions (if that will get him to change his mind) is more appealing than the alternative—annihilating him. Sir Basil Henry Liddell Hart astutely observed some years ago that the enemy of today is the customer of tomorrow and often the ally of the future: “To inflict widespread and excessive destruction is to damage one’s own future prosperity, and, by sowing the seeds of revenge, to jeopardize one’s future security.”⁶ History has demonstrated that wholesale attacks on population centers do little to break the enemy’s will to resist. On the other hand, the surgical removal of an enemy’s most vital elements should make it easier for him to surrender. Secretary of Defense Les Aspin observed that air power was “the most significant factor in winning [the Gulf] war” and pointed out that “the mass and precision of the [air] attack induced systemic shock and paralysis from which the political and military leadership never recovered.”⁷

Intelligence is another area affected by precision weapons. You have probably heard someone say that air power is targeting and targeting is intelligence.⁸ This is more than a catchy phrase—it’s the truth. A bomb carried halfway around the world and precisely guided to the *wrong* target wastes time, resources, and perhaps even a human life—not to mention the impotent picture it presents to our adversary! Our weapons now have “air-shaft accuracy,” and so must our intelligence.

I believe that a window of opportunity has opened. Air power’s precision, lethality, and ability to paralyze an adversary is at an all-time high. Our future enemies must realize they are vulnerable anywhere, anytime. President Bush summarized it best when he said, “Gulf Lesson One is the value of air power.”⁹

Of course, precision warfare is not possible without first controlling the air. As Gen Charles A. Horner succinctly observed, “Everything is possible if you



Civilian casualties of war, such as this Iraqi girl, produce an emotional impact that is acute and undeniable. Precision air warfare plays a part in reducing casualties on both sides.

have air superiority—little is possible if you lose it.”¹⁰ The F-22 aircraft, equipped with the advanced medium-range air-to-air missile (AMRAAM) and improved infrared missiles, will be key to achieving air superiority far into the future. We are often pulled in many directions for our time and money, but we must remember that failure to gain and maintain aerospace control jeopardizes everything else.

If history is any indication, there will be future operations in which air power alone can accomplish our nation's objectives. There will also be conflicts in which air power will have to pave the way for a land campaign. But I cannot imagine a future conflict in which air power will not be a major factor in achieving our national objectives.

Of course, with our capabilities of global reach and global power come new challenges and responsibilities. Air Force

Chief of Staff Gen Merrill A. McPeak warned us of complacency and challenged us to rid ourselves of two-dimensional thinking, an admonition that official Air Force doctrine has taken to heart: “If military power (including aerospace power) is to reach its full potential, all aspects of warfare must be reexamined from the aerial or three dimensional perspective.”¹¹

Aerospace control with precision weapons gives us a war-winning strategy for the future. Only air power can threaten every enemy's leadership, infrastructure, military, and national will on day one of the conflict. Any way you cut it, we will need smart airplanes with smart weapons to meet the challenges of the future. However, during this period of frenetic change, we would do well to remember King Solomon's counsel that “wisdom is more important than the weapons of war.”¹² He is right. People are always more important. All the so-called smart weapons in the world could not distinguish their own tail fins from the Pentagon if it were not for the smarter people who develop, build, maintain, and program them.

Outstanding Air Force people around the world helped our country win the last war, and with the support of our defense industry, they are already developing the weapons we will need to win the next one. □

Notes

1. George Bush, “Remarks at the United States Air Force Academy Commencement Ceremony in Colorado Springs, Colorado, 29 May 1991,” *Weekly Compilation of Presidential Documents* 27, no. 22 (3 June 1991): 685.

2. According to the Gulf War Air Power Survey Data Base, we used approximately 180 tons of precision munitions a day in Desert Storm. Our airlift capacity from the continental United States to Southwest Asia was 6,500 tons

a day. Nine C-141s (of the 234 available) a day could supply the daily PGM expenditures of Desert Storm. The bottom line is that we can rapidly deploy and easily sustain precision munitions.

3. GBU=guided bomb unit. The GBU-27 is a laser guided, 2,000-pound, hard-target penetrating weapon.

4. The SFW is a wide-area cluster munition consisting of 10 submunitions contained in a dispenser. Each submunition has four projectiles containing an infrared sensor, warhead, and associated electronics. Upon dispersion, each submunition orients and stabilizes. After reaching an optimum altitude—as determined by an onboard altimeter—the 40 projectiles disperse. Each projectile searches for targets with the onboard infrared sensor and—upon acquisition of a target vehicle—fires a self-forging, high-velocity slug at the target. USAF fact sheet, Air Force Materiel Command, Air Force Development Test Center, October 1992.

5. See Lawrence Freedman and Efraim Karsh, "How Kuwait Was Won: Strategy in the Gulf War," *International Security* 16, no. 2 (Fall 1991): 5–41. "The only factor that began to create pressure to get the land campaign underway

was unease in the West over the judgment, implicit in the massive air campaign, that any number of Iraqi deaths was worth the reduction of risk to coalition forces" (page 31).

6. Sir Basil Henry Liddell Hart, *Thoughts on War* (London: Faber and Faber Ltd., 1944), 42.

7. House Armed Services Committee, *Defense for a New Era: Lessons of the Persian Gulf War*, 102d Cong., 2d sess., 30 March 1992, 7.

8. See Air Force Pamphlet (AFP) 200-17, *An Introduction to Air Force Targeting*, 23 June 1989.

9. Bush, 685.

10. Lt Gen Charles A. Horner, commander, Ninth Air Force, briefing, subject: Reflections on Desert Storm: The Air Campaign, May 1991.

11. Air Force Manual (AFM) 1-1, *Basic Aerospace Doctrine of the United States Air Force*, March 1992, vol. 1,

15. As AFM 1-1 points out, airmindedness is not a doctrinal concept but a "mindset airmen should develop as they think through their form of military power and then apply to their profession of arms" (*ibid.*).

12. Eccles. 9:18.

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