BOOK REVIEW

MAD FICTION

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For public consumption, the official narrative of the Cold War celebrated nuclear weapons as the bulwark of US security. By deterring the Soviets from initiating a nuclear attack, and vice versa, the superpowers built strategic stability on a solid foundation of mutual terror. By credibly threatening devastating retaliation by survivable nuclear forces under the firm control of the US president and his Soviet counterpart, nuclear war would be prevented. And although the US and Soviet operational postures ran risks of accidental, mistaken, or unauthorized use of nuclear weapons, the public and the major institutions of government and society were solemnly assured that they were negligible risks.

Eric Schlosser offers a compelling repudiation of this entire narrative. His investigation shows definitively that the risks were far greater than officially admitted. The perceived need for nuclear weapons to be readily usable overrode concerns for their safety, and a combination of human and technical factors led to near disaster countless times. Thick secrecy, fact twisting about the US nuclear arsenal, and subterfuge aggravated the risks and allowed them to escape the control of the democratic process, and even to escape notice and remedial action within the inner precincts of the government. Even defense secretaries and presidents often floundered in the dark, unaware of the variety and magnitude of the dangers. A cloistered nuclear priesthood, largely unaccountable, created an illusion of safety that masked the systematic potential for tragedy on a monumental scale.

Schlosser's meticulous research and industrious document declassification builds the case that:

> The suppression of the truth has allowed a small and elite group of policy makers to wield tremendous, largely unchecked power. There are few issues more important than what nuclear weapons can do, where they are aimed, why they might be used, and who has the ability to order their use. I hope my book contributes, in some small way, to restoring a semblance of democracy to the command and control of the deadliest, most dangerous machines that mankind has ever invented.

Schlosser's mining and marshalling of evidence surpasses his goal.[1] He performs an invaluable service in showing how the nuclear enterprise in the United States went rogue.

His painstaking research breaks much new ground on the historical risks of accidental nuclear detonations in the United States and beyond, and is cogently presented. It is accessible yet firm in its grasp of the history.[2]

The central drama of the book is an engrossing play-by-play account of a 1980 accident at a Titan II nuclear missile silo near Damascus, Arkansas. An errant tool dropped by a maintenance crew member punctures the missile's fuel tank and begins a chain of events that tragically ends in a lethal explosion that lofts the 9-megaton warhead a thousand feet into the sky before falling nearby.

The full record of nuclear accidents remains shrouded by the veil of secrecy, but Schlosser uncovers a stunning history. He pried loose one document listing at least 1,200 US nuclear weapons involved in incidents from 1950 through 1968, including thirty-two serious accidents. Given so many close calls, it is remarkable that none detonated full-scale on US soil. The scientists and safety engineers responsible for weapon safety and the people who handled nuclear weapons in the field were often deprived of information they needed to make the weapons less dangerous. That not a single bomb ever detonated full-scale is partially due to their herculean and sometimes heroic efforts, but it is still surprising, given the innumerable opportunities presented.

Schlosser leaves to his readers' imagination the scale of the catastrophe that would have resulted from the full-scale detonation of the warhead in Damascus, saying only that "much of Arkansas would be gone." One model that calculates the harm caused by blast, radiation, and heat would have resulted in a few thousand fatalities and injuries in the Damascus vicinity.[3] (By way of comparison, a full-scale detonation of the warhead at Penn Station in Manhattan would have immediately killed millions of inhabitants and seriously injured millions more.) The radioactive fallout, however, could have killed hundreds of thousands, depending on the weather. The city where Governor Bill Clinton resided at the time could have been blanketed with lethal fallout within minutes to hours after the blast, in which case enormous fatalities and injuries would have been suffered. Little Rock would be a ghost town today.

"Decapitation" Debunks the Fiction

During the Cold War, neither the United States nor the Soviet Union could afford to ride out a nuclear attack because of the fragility of their respective command, control, and communications systems. Both sides could be easily decapitated, their key decision makers killed or cut off from the nuclear forces they controlled. (The top weapon in the US arsenal for this purpose was the bunker-busting Titan II missile, like the monster that nearly destroyed Arkansas.) This extreme vulnerability, which demolishes the Cold War fiction of stable mutual deterrence based on second-strike retaliation, was a closely guarded secret on both sides.

Schlosser gained access to numerous declassified top secret "decapitation" studies, all of which came to the disturbing conclusion that a small number of Soviet nuclear weapons could decapitate the US political and military leadership as well as destroy their means of disseminating launch orders.

Schlosser also obtained a pile of declassified top secret documents laying out the terms under which successive US presidents granted conditional nuclear launch authority to senior and mid-grade generals and admirals.[4] By contrast, the Soviets eschewed pre-delegation of launch authority. It was anathema in a political culture of top-down, centralized control. In desperation, they frantically dug deep command bunkers and built a "dead hand" apparatus that automated retaliation.[5] They also followed the US lead in adopting an accident-prone policy of launch-on-warning, enabling weapons to be launched upon receiving indications of incoming enemy missiles from early-warning satellites and ground-based radars. Schlosser recounts the many serious false alarms that occurred and explains the clear dangers of mistaken launch that this policy incurred.

A former commander of the strategic forces in the waning years of the Cold War, General (ret.) Lee Butler, candidly explained why it would take far more presidential will to *withhold* an attack than to authorize it in a crisis:

> Our policy was premised on being able to accept the first wave of attacks … Yet at the operational level it was never accepted … They built a construct that powerfully biased the president's decision process toward launch *before* the arrival of the first enemy warhead … a move in practice to a system structured to drive the president invariably toward a decision to launch under attack …[6]

Nuclear planners at the Strategic Air Command (SAC) in Omaha made launch-on-warning so essential to destroying the most critical Soviet targets that they effectively stripped presidents of any ability to ride out an attack before deciding how to respond. As Schlosser discusses, they also deprived the president of the choice to spare cities by surreptitiously assigning large numbers of US strategic weapons to targets in the immediate suburbs. Many hundreds were aimed at Moscow alone. (Today, an estimated 125 US strategic weapons are assigned to Moscow.) These planners—operating in a culture of secrecy and defying civilian oversight—an ethos originally planted by General Curtis LeMay—became a rogue force during the Cold War.

In reality, launch-on-warning was impractical for many reasons, not the least of which was the distinct possibility that Soviet nuclear-armed submarines patrolling off the US coasts (with six-minute missile flight times, according to former President Ronald Reagan's memoirs) could have destroyed Washington and shut down strategic communications before the president could even be notified, let alone order a response. A general with pre-delegated authority would have then attempted to send the "Go Code"—or launch order—during the outage. Game over.

Myriad doubts about the feasibility of retaliation—by means of pre-delegation, doomsday machinery, or launch-on-warning—accumulated to a point that the preferred option on both sides was preemptive attack while the president, the chain of command and communications, and the forces were intact. Fearing an inability to retaliate at all, both sides were all too ready to *initiate a first strike* in a crisis. While the world was told to celebrate the mutual vulnerability of entire populations on the grounds that it provided for highly stable mutual deterrence, the inside planners knew all too well that this was fiction. Mutual assured destruction was only for public consumption. That's where matters stood until the end of the Cold War.

New Threats, Old Posture

In principle, the post-Cold War era should have allowed for nuclear safety and safeguards to take precedence over launch readiness. Many experts and politicians called for taking strategic missiles off of hair-trigger alert and shelving the option of launch-on-warning, but in the end, Presidents Bill Clinton and Boris Yeltsin merely agreed to stop targeting each other. This "de-targeting" agreement was superficial. It added not a single second to the launch procedures on either side, and did nothing to mitigate the risk of launching on false warning.[7] The strategic missiles on both sides remained fueled, loaded with wartime aimpoints, armed, and ready to fire in milliseconds after receiving a short stream of computer signals. Today, many hundreds of missiles on land can be fired in two minutes and hundreds more on submarines can be fired in twelve minutes. Two thousand nuclear explosions could occur in both countries within an hour after the outbreak of nuclear war in 2014.

Schlosser raises a major new worry about this vestigial practice: it exposes command and control to cyberattack. And contrary to assurances that the nuclear circuits are hermetically sealed off with air gaps and firewalls, investigators have found plenty of cracks in the firewalls. In the 1990s, a highly classified Pentagon investigation discovered an electronic crack in the naval broadcast network used to transmit launch orders to Trident ballistic missile submarines on launch patrol in the Atlantic Ocean. Hackers could electronically seize and remotely operate the main radio transmission site used for this purpose. The Navy took this threat so seriously that it completely revamped procedures so that submarine crews would not immediately carry out launch orders received out of the blue. (This was not extended to the Air Force's Minuteman missile crews, lest delay in launching during a surprise attack imperil their survival.)

Schlosser cites others sounding the tocsin. A group of top US technical experts recently met to review nuclear safety and concluded that "cybersecurity of nuclear command and control networks in the United States, Russia, and other states is of critical importance and warrants attention." A report by the Department of Defense's Defense Science Board warned recently that the vulnerability of the US nuclear command system to cyberattack has never been fully assessed.

And yet despite these concerns, President Barack Obama's new nuclear operations and targeting guidance embraces the aims of maintaining high launch readiness and preserving the option to launch on warning. In the face of ignorance about the scale of danger posed by cyber infiltration causing an unauthorized or mistaken launch, we seem to be throwing the cosmic dice once again, by prioritizing the usability of nuclear missiles over safety.[8]

In sum, US nuclear forces operate today pretty much the same way as they did before the Cold War's end, though with far less spirit. People up and down the chain of nuclear command still go through the motions. At this very moment, missile launch crews in California and several western states are being trained in mock launch centers to fight a large-scale nuclear war with Russia. But these young millennial-generation officers say this training feels tenuously connected to the real world.[9] They came of age in the post-Cold War era, when Osama bin Laden emerged as a much more plausible enemy than Russia.

The latter threat is passé (recent saber-rattling over Ukraine notwithstanding), and consequently, morale and discipline have plummeted throughout the nuclear enterprise at all ranks. In a recent interview, Schlosser quotes the top general responsible in 2013 for all of the US Air Force's nuclear weapons saying the threat of a Russian nuclear attack on the United States is such a remote possibility that it's "hardly worth discussing." He says "the greatest risk to my force is an accident … [someone] doing something stupid."

What about other countries doing something stupid? We're seeing nuclear readiness increasing in all the other nuclear weapon states, and with increased operational tempo will come increased risks of accidents, particularly in developing countries with newly deployed weapons.

Conclusion

Eric Schlosser deserves a medal for exposing the popular narrative of the Cold War for the fiction that it is. The nuclear confrontation was anything but stable. It teetered on the edge of conflagration. Unleashing the forces took priority over preventing their use by accident, mistake, or without authority. Safeguards and safety features fell short in peacetime and degenerated in a crisis. And because of the uncertainties of retaliation—whether by means of pre-delegation, doomsday machinery, or launch-on-warning—both sides stood all too ready to initiate a first strike in a crisis.

Schlosser thoroughly captures this shrouded arc of Cold War history. Would that the major institutions of society and government (media, academia, think tanks, Congress) and key civilian officials most responsible for nuclear policy possessed Schlosser's grasp of the extraordinary danger lurking beneath a false sense of security. Extreme secrecy hid the truth from them. Only a small coterie of nuclear mandarins knew the score. Excessive secrecy remains a serious obstacle to exercising democratic control over nuclear weapons, and it undermines our security, but less so thanks to Schlosser's exposé.

NOTES

1. Schlosser industriously pried loose many of the classified documents used throughout his book through Freedom of Information requests. He also draws appreciatively on the trove of declassified documents obtained by the nonprofit National Security Archive at The George Washington University and its nuclear guru, Bill Burr.
2. Of other studies of a more technical nature that substantially overlap the Schlosser book, I would recommend Stephen I. Schwartz, ed., *Atomic Audit: The Costs and Consequences of U.S. Nuclear Weapons Since 1940* (Washington, DC: Brookings Institution Press, 1998), especially the chapter by myself, John E. Pike, and Stephen I. Schwartz, "Targeting and Controlling the Bomb," pp. 197–268; Scott D. Sagan, *The Limits of Safety: Organizations, Accidents, and Nuclear Weapons* (Princeton, NJ: Princeton University Press, 1993); Peter D. Feaver, *Guarding the Guardians: Civilian Control of Nuclear Weapons in the United States* (Ithaca, NY: Cornell University Press, 1992); Janne E. Nolan, *Guardians of the Arsenal: The Politics of Nuclear Strategy* (New York: Basic Books, Inc., 1989); Bruce G. Blair, *Strategic Command and Control: Redefining the Nuclear Threat* (Washington, DC: Brookings Institution Press, 1985), and Bruce G. Blair, *The Logic of Accidental Nuclear War* (Brookings Institution Press, 1993).
3. See Alex Wellerstein, "NUKEMAP," <http://nuclearsecrecy.com/nukemap/>.
4. President John F. Kennedy straddled this fence. His national security team viewed President Dwight D. Eisenhower's predelegation arrangements as an unauthorized launch waiting to happen, and

recommended ending the practice. But Kennedy fretted about his standing at the Department of Defense if he went against the judgment of a revered four-star general like Eisenhower. He vacillated, and in the end, he struck an ambiguous pose, neither issuing new predelegation letters of last resort under his signature, nor revoking the previous letters signed by Eisenhower. Ambiguity be damned, General Thomas Power believed without question that he inherited General Curtis LeMay's authority to transmit the Go code if the lines to President Kennedy went down. Power was in charge of the strategic forces during the Cuban missile crisis, which were plagued by a multitude of command and communications problems. The nation came closer to a Power-directed nuclear strike against Soviet forces and territory than anyone realized at the time.

5. Bruce G. Blair, "Russia's Doomsday Machine," *New York Times*, October 8, 1993, p. A35; William J. Broad, "Russia Has 'Doomsday' Machine, U.S. Expert Says," *New York Times*, October 8, 1993, p. A6.

6. Jonathan Schell, *The Gift of Time* (New York: Metropolitan Books, 1998), pp. 191–94.

7. Bruce G. Blair, "Where Would All the Missiles Go?" *Washington Post*, October 15, 1996, p. A15.

8. See Department of Defense, "Report on Nuclear Employment Strategy of the United States Specified in Section 491 of 10 U.S.C.," June 19, 2013, <www.defense.gov/pubs/reporttoCongressonUSNuclear EmploymentStrategy_Section491.pdf>. It is worth noting that this statement of requirement was classified top secret only weeks before being publicly released. What was believed to cause extremely grave damage to national security if disclosed suddenly became benign.

9. Silo-sitters have actually said this for twenty years. For a representative view from three generations of Minuteman launch officers who served in Montana during the past forty years, see Bruce Blair, Damon Bosetti, and Brian Weeden, "Bombs Away," *New York Times*, December 7, 2010, p. A33.

10. See "De-Alerting Strategic Forces," in George P. Shultz, Sidney D. Drell, and James E. Goodby, eds., *Reykjavik Revisited: Steps Toward a World Free of Nuclear Weapons* (Stanford, CA: Hoover Institution Press, 2008).

Appendix: Clarifications and Corrections

For the expert reader of Schlosser's book, it is impressively accurate down to the smallest details. The disputable details addressed below constitute a very small fraction of the mountain of data this book contains.

1. p. 206: **"Once the SIOP [Single Integrated Operational Plan] was set in motion, it could not be altered, slowed, or stopped."** A SIOP war termination order could have been authorized and transmitted using special codes in the possession of all forces and strategic command posts (kept in the safe alongside the launch authorization codes), which would have set a definite time at which to cease nuclear launches/strikes.

2. p. 273. **"SAC [Strategic Air Command] began to develop … a command post on a train …"** Such a train command post was never deployed.

3. p. 273. **"If SAC's airborne command posts somehow failed to send the Go code, it could be sent by radio transmitters installed in a handful of Minuteman missiles."** The Minuteman-based Emergency Rocket Communications System (ERCS) depended heavily upon SAC airborne command posts successfully transmitting the Go code to the Minuteman launch crews who in turn fired the ERCS missiles. ERCS worked this way: an Omaha-based airborne command post, probably "Looking Glass," would have flown to the Whiteman Air Force Base (AFB) Missouri area where the six ERCS missiles were deployed. Looking Glass would normally use line-of-sight ultra-high frequency radio to transmit the Go code to all the Minuteman crews in the wing, who would

proceed to launch their nuclear-tipped missiles *en masse*. The Minuteman crews in the squadron controlling the ERCS missiles would have the additional duties of reading out the launch order into a device that inserted their voice launch order (the same alphanumeric code as just received by everybody) into the payload (a UHF transmitter) of an ERCS rocket (they were chosen for their sonorous timbre!), and then firing it. Looking Glass possessed some capability for direct message insertion and firing ERCS missiles, but the system worked far more reliably if managed from the underground launch centers of the Minuteman crews. In other words, SAC's airborne command post could not fail to send the Go code while successfully loading and launching ERCS. The pre-recorded message was recorded after a Go code was received using the contents of that Go code.

4. p. 274. Schlosser's description of the president's National Emergency Airborne Command Post (NEACP) posture and its vulnerability to sudden attack at Andrews Air Force Base (AFB) is somewhat misleading; it suggests that in the event of an attack, the "Doomsday" plane would remain on the ground until the president was safely aboard. In the event of detecting incoming missiles, NEACP would likely have attempted to take off immediately and then rendezvous at predesignated locations within helicopter flying range from the White House. The president or vice president would board the presidential helicopter at the White House and be whisked off to the rendezvous location where they would board NEACP. Of course in a protracted crisis, the president or vice president could go to Andrews AFB at a more leisurely pace, board NEACP, and take off from there.

5. p. 300. **"The new [Minuteman launch control] system eliminated the [single-vote] timer ... "** The modifications did eliminate the ability of a two-person Minuteman crew to set the timer, but it did not actually eliminate the timer. From then until today, a single crew of two can "vote" to launch, and this single vote will launch the entire fifty-missile squadron after the timer expires (at least thirty minutes later) if the other four crews in the squadron are destroyed, or as long as no other surviving crews initiate a veto of the single vote.

6. p. 302. Schlosser's description of Defense Secretary Robert McNamara's strategy of "assured destruction" requiring the ability to destroy Soviet urban industrial centers and populations suggests that this was an operational guideline completely ignored by the targeteers at SAC in Omaha. Although McNamara sought to emphasize assured destruction in an effort to back SAC away from its wartime aims of damage limitation—which required prodigious numbers of nuclear weapons and a preemptive attack posture—it was never truly an operational guideline meant to concentrate US nuclear strikes against cities. The SIOP was—and remained throughout the Cold War—a "capabilities" plan which meant simply that SAC sought to execute all of its forces at a target set that peaked finally in 1986 at about 16,000 targets in the Soviet bloc.

SAC needed to generate all its off-alert forces to alert and launch preemptively or on tactical warning in order to destroy this huge target set, which included hundreds of Soviet cities and more than 10,000 military targets.

7.   p. 303. **"The new SIOP divided the 'optimum mix' into three separate target groups: Soviet nuclear forces, conventional military forces, and urban-industrial areas."** There was also established in the second SIOP a special "withhold" category for national level leadership/command-control facilities, mostly in Moscow and Beijing. So there were four groups of targets. The SIOP execution could hit all three groups mentioned in the Schlosser quote, withholding leadership, or hit all four groups including leadership.

8.   p. 303. **"SAC's Looking Glass command post, airborne twenty-four hours a day, increased the likelihood that a Go code could be sent after the United States was hit."** Looking Glass turned out to be highly vulnerable to electromagnetic pulse (EMP) effects from a high altitude nuclear detonation over the United States. It might have literally fallen out of the sky after EMP fried its avionics. I served in the Looking Glass unit at SAC in the early 1970s and I can verify that nobody had much confidence it would survive or possess the communications range to transmit the Go code successfully. Schlosser emphasizes this possibility later in the book (p. 356).

9.   p. 355. **"…[T]he head of SAC deliberately hid 'certain aspects of the SIOP' from him [Henry Kissinger]."** One can speculate what was "hidden": 400 nuclear weapons assigned to greater Moscow metropolitan area, sixty-nine aimed at the Pushkino anti-ballistic missile radar in the suburbs alone; country-wide targeting of the suburbs that would have obliterated a hundred Soviet cities even if the president spared group three (urban-industrial targets); refusing to let any civilians inspect the "black book" to be consulted by the president in a nuclear emergency carried by his military aide in the "football" briefcase; and ensuring that the successful execution of the SIOP absolutely required launch-on-warning by assigning critical targets to the intercontinental ballistic missile force that must be launched on warning to survive.

10. p. 359. Schlosser's account of the exchange of views by Secretary of State Henry Kissinger and others on the merits of launch-on-warning (LOW) policy should further underscore that, rhetorical flourishes in the White House notwithstanding, the SAC targeteers made sure LOW policy was absolutely required and every president acquiesced to the systemic imperative to authorize it.

11. p. 360. Schlosser is correct that President Jimmy Carter asked that the "black book" use cartoon-like illustrations to simplify his choice of SIOP options in an emergency. Again, however, recall that senior civilians responsible for aligning the SIOP and the "black book" were not allowed to examine that book throughout the Cold War until Caspar Weinberger, defense secretary in the Ronald Reagan administration, insisted.

12. p. 365–66. The reader gets the impression that threat assessment conferences (TACs) were called once or twice a week to assess indications of possible nuclear missile threats to North America. In reality, they have been called only a handful of times in total. These were indeed serious false alarms. The missile display conferences do get serious at the higher weekly rate, but they are normally resolved short of upgrading to TACs.

13. p. 366. The description of a false alarm in 1979 is sound, though the offending tape simulating a full-scale Soviet nuclear attack had been left and forgotten in an off-line backup computer that unfortunately later kicked into operation when the primary computers needed re-booting/maintenance. When it kicked in, the false data were transmitted from North American Aerospace Defense Command to all the major nuclear command centers and triggered the extensive precautionary alert steps described well in the book. The heightened alert actions resulting from this incident, however, particularly the alleged take-off of the president's "Doomsday" plane from Andrews without President Carter on board (an operator on this plane at the time has stated that it taxied but did not take off) and many other data points in the book, lack citations. This is hardly a damning criticism in view of the mountain of citations that the book does provide, but there is an uneven quality at times in this regard.

14. p. 371. **"The lock had been placed on the bomber, not inside the bombs …"** There were also permissive actions links (PALs, a locking device to prevent unauthorized arming or detonation) on the bombs, however, which were activated when the bombs were placed into storage on base. Thus a stolen weapon from such a location would have been protected. When the bombs were uploaded to alert bombers, the crews zeroed out the storage PALs and reverted to the cockpit coded switch device that controlled the bomb bay, as the book explains. It is worth noting that every PAL and coded-switch device is assessed for its effectiveness against time. Documents exist which indicate how long each device would take to circumvent.

15. p. 371. **"During the late 1970s, a coded switch was finally placed in the control center of every SAC ballistic missile. It unlocked the missile, not the warhead."** Upon receipt of the unlock code in the launch execution order, the code entered into the coded switch (called "enable panel") in Minuteman launch centers, enabled (armed) the missiles for launch (warhead detonation would be subject to environmental sensor device criteria to be satisfied during flight). The Minutemen missiles would not accept a subsequent launch command unless they had been armed previously. Before 1977, no unlock codes were required by the underground launch crews to execute a strategic missile launch.

16. p. 434–35. Defense expert Fred Iklé deserves the book's attention and admiration for his work at the RAND Corporation and for advocating strengthened safeguards against accidental and unauthorized launch, but his contributions during the Reagan administration in the Weinberger defense

department were not major. He was not a major player in the nuclear employment policy debates and planning, even though it was his official portfolio.

17. p. 444. **"… the secrets of the Titan II had recently been compromised … the information that [Deputy Commander Christopher M.] Cooke gave the Soviets—about launch codes, attack options … was 'a major security breach … the worst perhaps in the history of the Air Force.'"** Cooke's damage went far beyond the secrets of Titan II. The launch codes, attack options, etc. were the same exact ones used throughout the nuclear force. He compromised, for example, the flag word used in all SIOP execution messages. If the Soviets learned this flag word and its meaning, they would have been able to eavesdrop and detect SIOP execution before the US land- and sea-based crews even authenticated the launch order! Needless to say, the flag word was changed when Cooke's betrayal came fully to light.

18. p. 446. **"SAC bombers entered Soviet airspace and then left it, testing the air defenses …"** This assertion demands a credible source and citation. I question its veracity. I have heard rumors of things like SR-71 reconnaissance aircraft heading straight for the Soviet coasts to trigger air defense radars, and RC-135 reconnaissance planes did this all the time by electronic spoofing, etc. Perhaps SAC bombers flew beyond their standard fail-safe points (which were situated right on the edge of Soviet air defense radar range) to trigger Soviet radar and fighter interceptor scramble, but this forward operation would have still remained well outside Soviet territorial airspace.

19. p. 463. **"Under the DEFCON 3 rules of engagement, the American fighter pilots had the authority to fire their atomic antiaircraft missiles and shoot down the Soviet planes."** Citation lacking. This surprising assertion needs supporting evidence.

20. p. 473. According to Schlosser, the incident in 2007 in which a strategic bomber with six nuclear-tipped cruise missiles onboard (unbeknownst to the pilot and crew) involved "violating the safety rule that prohibits nuclear weapons from being transported by air over the United States …" In fact, safety regulations in effect at the time noted that air transport was the preferred mode of moving nukes anywhere in the world, including across the United States. It is still allowed today, although except for nuclear weapons moved by air to and from overseas the primary mode of transportation is ground vehicle… There is a lot of official guidance on air transport, such as avoid flying with nuclear weapons near the territory of unfriendly nations, avoid flying over densely populated areas, and avoid, if possible, carrying the W88 submarine nuclear warhead with its "non-insensitive high explosives" package.

21. p. 478. **"The targets of American missiles are no longer pre-programmed. They are transmitted right before launch, and the default setting of the missiles would send their warheads into the nearest ocean."** This is not

completely true. Each Minuteman III missile has multiple preprogrammed targets in memory onboard, in addition to the one ocean target to which its gyros are oriented in peacetime. At launch, the crew gets a war plan number from the launch order and keys that number into a command that is transmitted to all the missiles, instructing them to select the appropriate preprogrammed target in their memory that corresponds to that war plan. As for default settings, the ocean target of each missile lies on a straight line between the Minuteman missile and its main wartime target, so that at launch time, the missiles just alter their elevation angle slightly (like a water hose aimed vertically is lowered for more range) to hit their wartime targets. As for submarine-launched missiles, they are not aimed in peacetime because they are dormant without gyros running (which take twelve minutes to spin up), so the idea of ocean targeting for submarine missiles is a bit weird to suggest.[10] All this de-targeting agreement minutiae is little more than public relations. Switching from ocean targeting to wartime targeting is like changing television channels.

22. p. 478. **"On January 25, 1995, the launch of a small research rocket by Norway prompted a warning at the Kremlin that Russia was under attack by the United States. Russian nuclear forces went on full alert. President Boris Yeltsin turned on his 'football,' retrieved his launch codes, and prepared to retaliate."** This account is conventional wisdom widely shared within the expert nuclear community, and for good reason: Yeltsin himself was the main source of the story. However, an alternative account given to me by a top general on duty in the Strategic Rocket Forces at the time of the false alarm is that the alarm was called off before Yeltsin was contacted, and that Yeltsin soon thereafter decided to "re-enact" the event with him in charge of the "football" in order to bolster his tough-leader image at a difficult time of Russian weakness during the war in Chechnya. If this version is true, Yeltsin pulled the wool over the worldwide public's eyes and left an apocryphal nuclear scare story as his legacy.

23. p. 479. **"Since the early 1990s the two countries [India and Pakistan] have come close to nuclear war about half a dozen times ... ."** "Close" is a somewhat vague word and perhaps it could be defended, but if a reasonable operational definition of "close" would be that nuclear forces are assembled and deployed onto a wartime footing—a kind of DEFCON 2 level alert and launch readiness—then "close" does not describe these crisis confrontations unless credible source material establishes that such warhead mating to delivery vehicles occurred.

24. p. 483. **"The administration of President George W. Bush ... broadened the scope of the OPLAN [operations plan]. Bush's counterforce strategy, adopted after 9/11, threatened the preemptive use of nuclear weapons to thwart conventional, biological, and chemical attacks on the United States."** In fairness to Bush, it was President Clinton and Defense Secretary

Bill Perry whose nuclear posture review in 1993 broadened the scope of the SIOP to address non-nuclear threats such as biological weapons. (It was also their Presidential Decision Directive 60 in November 1997 that put China back into the SIOP after a hiatus of nearly twenty years, opening the floodgates for the targeteers to ramp up counterforce plans for nuclear war with China (a cottage industry that is offsetting much of the decreasing targeting of Russia).

25.   p. 483. Schlosser's characterization of former Defense Secretary Harold Brown and Central Intelligence Agency Director John Deutch as liberal Democrats stretches the vernacular too far. They were (and are) conservatives in matters of nuclear policy. For example, Brown presided over the big effort to refine Soviet leadership targeting and he cooked up new options for launch-on-warning.