



The Field of Life and Death: Writing about Nukes

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Conflict is timeless...

兵者
國之大事
死生之地
存亡之道
不可不察也

Warfare

is a great affair of the state.

The field of life and death,

The way [Tao] of preservation and extinction.

It cannot be left unexamined.

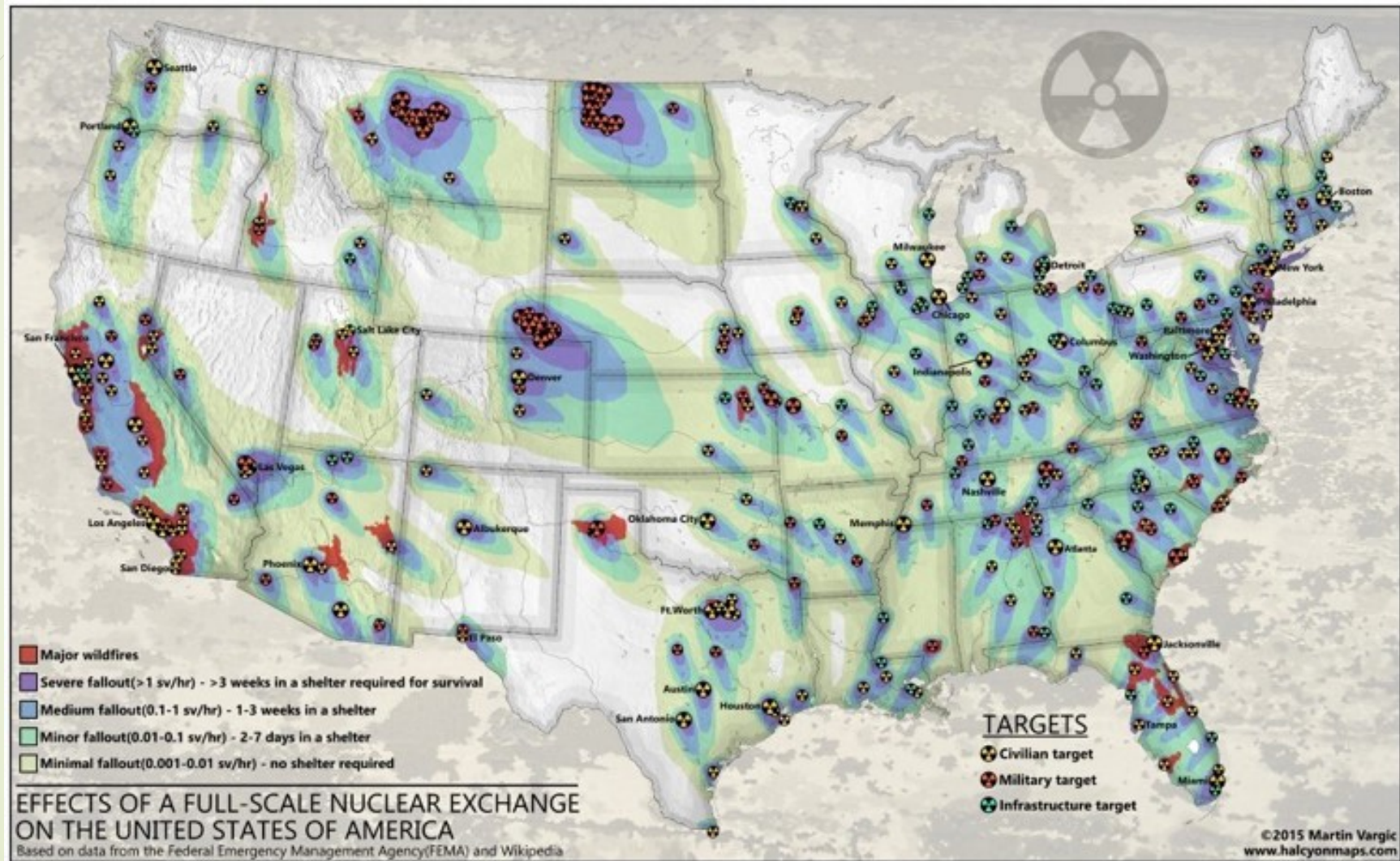
-- Opening lines of "The Art of War" by Sun Tzu, ~4th Century BC
(translation by Victor Mair)

...but technology changes...

- ▶ Operation Crossroads, July 1946 (Baker device, 23 kt)

Video at: <http://bfwa.com/carthago/Baker-all.mp4>

...and so do the stakes.



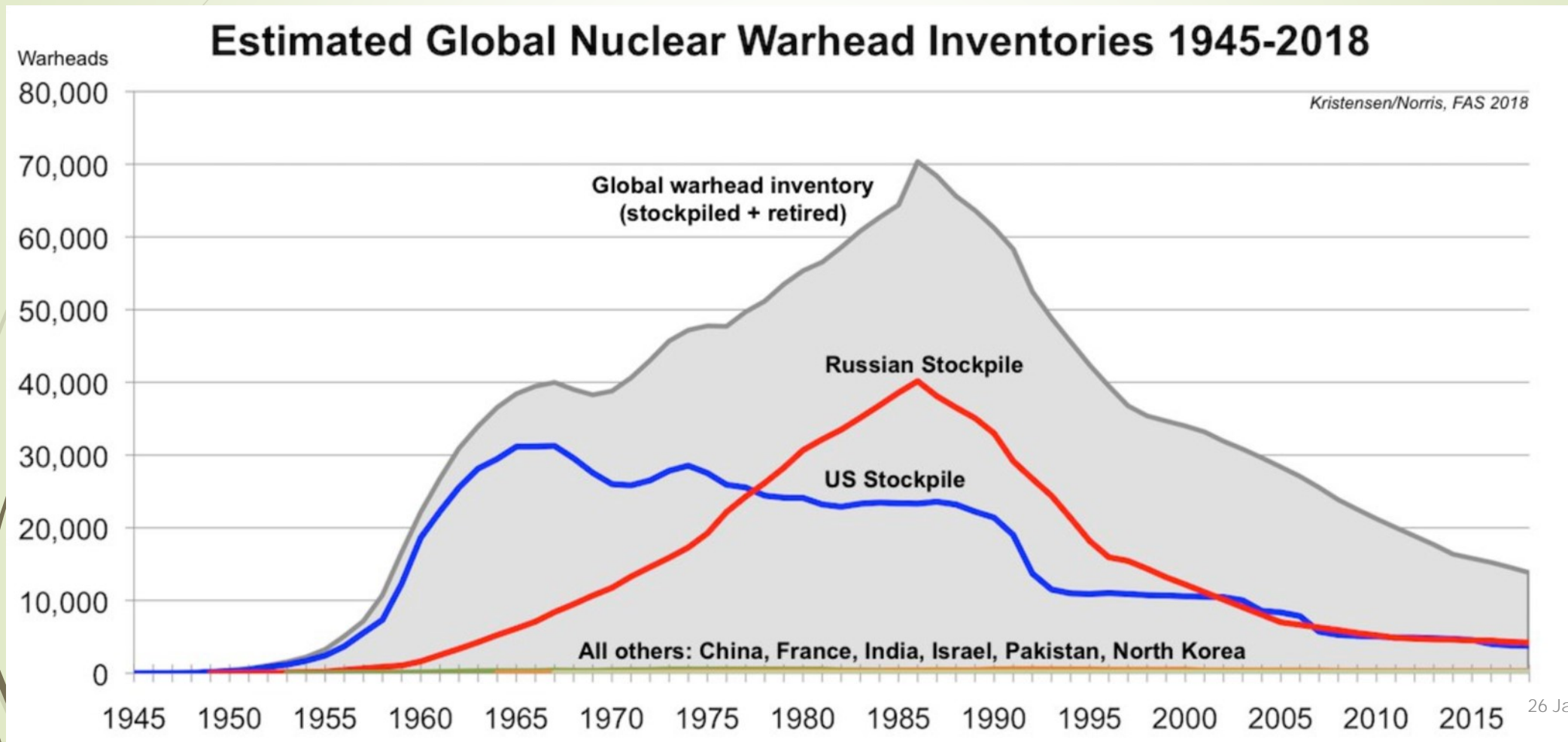
The Big Debate since 1946: AD vs. DL

- ▶ Assured Destruction (AD): “two scorpions locked in a bottle”
 - ▶ Bernard Brodie, *The Absolute Weapon* (1946)
 - ▶ “Countervalue” strategy: destroy cities, civilians, industry, agriculture
 - ▶ Focus on large numbers of long-range weapons with high yields
 - ▶ If anyone goes nuclear, we all lose
 - ▶ Destabilized by missile defense (ABM) systems
- ▶ Damage Limitation (DL): “escalate to de-escalate”
 - ▶ William Liscum Borden, *There Will Be No Time* (1946)
 - ▶ “Counterforce” strategy: destroy enemy’s (remaining) nuclear weapons
 - ▶ Focus on small number of mid-range/tactical weapons with low yields
 - ▶ Limited nuclear intervention, followed by de-escalation, seen as feasible
 - ▶ Destabilized by threat of preemptive first strike, MIRV devices

AD v DL (continued)

- ▶ Assured destruction (Brodie)
 - ▶ Countervalue level: ability to wipe out 50% of the population and 33% of industry
 - ▶ Force required: 400 equivalent megatons (EMTs) [McNamara, 1964]
 - ▶ BUT: USN and USAF *each* wanted 400 *survivable* EMTs => 1600 EMTs (30K warheads)
 - ▶ If deterrence fails: game over, man
- ▶ Damage Limitation (Bordon)
 - ▶ Counterforce level: able to destroy weapons, hardened targets, ABM systems
 - ▶ Force required: depends upon opponent
 - ▶ If it fails: counterforce strike to limit/defeat further enemy attack

What we survived through (so far)



US Nuclear Strategy (after Kartchner)

- ▶ 1945-1960 (Truman, Eisenhower): Massive Retaliation
 - ▶ Tremendous US superiority in # of warheads
 - ▶ BUT: Sputnik threatens 30-minute unstoppable strikes anywhere in the US (vs. hours by slow and vulnerable bombers)
- ▶ 1960-1968 (Kennedy, Johnson): Assured Destruction
 - ▶ Attempt at 'Flexible Response' (DL), but abandoned for AD
- ▶ 1968-1989 (Kennedy, Nixon, Ford, Carter, Reagan): AD/DL
 - ▶ Official policy is AD, but move in 1974 to a 'countervailing strategy' (DL)
 - ▶ Push to get Soviets to start matching reductions in US stockpiles
 - ▶ Meanwhile: rise of China as a nuclear power, as well as proliferation elsewhere (India, Pakistan, Israel)
- ▶ 1990-2016 (Bush 41, Clinton, Bush 43, Obama): AD/DL + reductions
 - ▶ Mutual massive reductions in warhead stockpiles (especially under Bush 41)
 - ▶ More proliferation (Iran, North Korea, others)
 - ▶ Obama (Prague, 2009) talks about global disarmament, but has backtracked by 2012 due to Russian intransigence
- ▶ 2016-present (Trump): still AD/DL, but with new developments
 - ▶ Refocus on modernizing US nuclear arsenal
 - ▶ Responding to various Russian nuclear weapons initiatives
 - ▶ Including withdrawing from INF Treaty that Russia has violated for years
 - ▶ But: call (by Trump in 12/2018) for Russia, China, US to sit down for arms limitation

The 'Nuclear Taboo': 73 years old

- ▶ No military use of nuclear weapons by any party since Hiroshima and Nagasaki (August 1945)
- ▶ Limited use of nuclear weapons has, in fact, been considered many times over that period
 - ▶ US debated use of nukes in Korean War (1950)
 - ▶ French asked US to use nukes in French-Indochina War (1954)
 - ▶ US military leaders debated use of nukes in Vietnam War (1965 onward)
 - ▶ Nuclear weapons were considered and ruled out in First Iraq War (1990)
- ▶ Nuclear taboo based on AD: inevitable catastrophic escalation
- ▶ BUT: if nuclear weapons are ever used, with little or no escalation, the nuclear taboo will likely be broken forever

Nuclear war scenarios

- ▶ Pre-emptive nuclear first strike (counterforce and/or countervalue)
- ▶ Limited nuclear use in aggressive, deliberate attack
- ▶ First nuclear use against escalating biological, chemical, or conventional attack
- ▶ Massive cyber attack provoking a nuclear response
- ▶ Catalytic use: forcing a third party to go nuclear to intervene in a non-nuclear conflict
- ▶ Accidental launch or detonation, or false warning of launch/attack
- ▶ Terrorist attack (state-sponsored or non-state actor)

Major Regions of Nuclear Tension

- ▶ India v Pakistan
 - ▶ Nuclear states with disputed territory, extensive shared borders, deep political and religious (Hindu v. Muslim) differences – see following slides
- ▶ The Middle East
 - ▶ Israel has nukes and is prepared to deny nukes to hostile countries
 - ▶ Reminder: Israel is 1/10th the size of Utah
 - ▶ Iran (Shi'a) wants nukes; Saudi Arabia (Sunni) likely financed Pakistan (Sunni) nuclear program and may have access to their nukes
- ▶ Russia and the Near Abroad (Eastern Europe – former Soviet states)
 - ▶ Russia has strong ABM around Moscow and has invested heavily in tactical nuclear weapons (in violation of Intermediate Range Nuclear Forces Treaty [INF, 1987])
 - ▶ US had eliminated most tactical nuclear weapons, but has now withdrawn from INF and is developing sub-based tactical nuke to be able to respond to Russian attacks in Europe
- ▶ East Asia (China, North Korea, Japan)
 - ▶ China is asserting territorial dominance in the region, challenging the US
 - ▶ North Korea appears to be de-escalating, but is still a wild card
 - ▶ Japan sees both China and North Korea as threats and could likely build working nuclear weapons in months, if not weeks (owns 40 tons of weapons-grade plutonium)

Top 12 Reasons Why India-Pakistan Will Be Next Use of Nuclear Weapons

- **As stated by Dr. Kerry Kartchner, former US arms negotiation official**
- #1: Profound border disputes from day one (1947)
- #2: Both have nuclear weapons
- #3: Both have fought several wars vs each other
- #4: India has civilian control of government while Pakistan has military control
- #5: Pakistan is a 'failing state' in terms of government stability
- #6: India has suffered multiple serious terrorist attacks out of Pakistan

Top 12 Reasons (cont.)

- ▶ #7: Both have mutually destabilizing military postures
 - ▶ India: 'Cold Start' strategy pre-positions military forces on Pakistani border
 - ▶ Pakistan response: deployment of short-range nuclear weapons
 - ▶ India counter-response: development of long-range nuclear weapons
- ▶ #8: Both are in defiance of Non-Proliferation Treaty and int'l pressure
- ▶ #9: The Nuclear Non-Proliferation Act limits the advice and aid that the US can give to either party in proper and safe handling of nuclear weapons
- ▶ #10: Both India and Pakistan have complicated relationships with the US, which limits our influence with each
- ▶ #11: Political, economic, and military asymmetries between the two further destabilize their relationship
- ▶ #12: Both have enormous national prestige tied up in their nuclear forces

Things We Tend to Get Wrong

- ▶ Nuclear Winter is unlikely
 - ▶ Kuwait oil fires, Mt. Pinatubo eruption undermine models
- ▶ Duck and Cover is actually good advice
 - ▶ Protects from light flash, heat, projectile debris
- ▶ Most fallout has a short half-life (measured in hours, days, a few weeks)
 - ▶ BUT: ground-based detonations create more lasting fallout than airbursts
 - ▶ Unconsumed fission material (uranium, plutonium) will tend to settle closer to the blast zone due to atomic weight
 - ▶ Greatest danger is ingestion of radioactive materials (eat, drink, breathe)
- ▶ Most nuclear blast effects (heat, radiation, shockwave) fall off at an inverse-square rate (remember nuclear test observers)
- ▶ Electromagnetic pulse (EMP) effects are limited for ground-based detonations (very high altitude appears to be most effective)

Some Useful References

- ▶ *The Effects of Nuclear Weapons*, 3rd ed., Samuel Glasstone and Philip J. Dolan, eds. (US Government Printing Office, 1977)
- ▶ *Responding to Catastrophic Effects: Consequence Management and Politics*, Jeffrey A. Larson, ed. (Palgrave Macmillan, 2013)
- ▶ *The Case for U.S. Nuclear Weapons in the 21st Century*, Brad Roberts. (Stanford University Press, 2016)
- ▶ *On Limited Nuclear War in the 21st Century*, Jeffrey A. Larsen and Kerry M. Kartchner, eds. (Stanford University Press, 2014)
- ▶ *The Logic of American Nuclear Strategy: Why Strategic Superiority Matters*, Matthew Kroenig. (Oxford University Press, 2018)
- ▶ *The Making of the Atomic Bomb*, Richard Rhodes. (Simon & Shuster, 1986)

Questions?

