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[2.3] 1970-2000: CW IN THE BALANCE

* While Soviet secrecy kept the details hidden, the USSR engaged in a chemical arms buildup that almost certainly matched that of the Americans. The Soviets seemed to have a particular liking for GD / soman, and were believed to have stolen the formula for VX and developed a variant that remained effective in extreme cold. It was clear the Red Army possessed a strong CW capability.

Egyptian forces were strongly suspected to have used CW, possibly supplied by the Soviets, during their intervention in Yemen in the 1960s. In the mid-1970s reports began to trickle out of Southeast Asia that the Vietnamese, another Soviet ally, were using a new and savagely effective gas in attacks on Hmong tribesmen in Laos, who had been allies of the Americans and stubborn foes of the Communists. Refugees spoke of aircraft pouring out a "yellow rain" that caused choking, chemical burns, massive bleeding, and rapid death. There were many reports, but the puzzling thing about the combination of symptoms reported was that it matched the action of no known chemical agent. US Army scientists suspected that the "yellow rain" was some mix of chemical agents, or a new chemical or biological toxin.

The idea that "yellow rain" was some biological toxin was given a little weight in 1981, when a leaf and a few other plant fragments that were covered with a white mold were examined. The mold had a very high concentration of fungal poisons known as "mycotoxins". However, the Soviets and Vietnamese denied they were using chemical or biological warfare in Laos. The evidence was thin at best, and the mycotoxins discovered, while deadly, were nowhere near as toxic as any nerve gas and much more expensive to produce. In the absence of any definitive information, "yellow rain" was nothing more than an unsettling rumor.

* In the meantime, talks with the Soviets on chemical weapons limitation had bogged down over issues of verification and enforcement. CW hawks in the US, suspicious that the USSR was using the talks as a mask for improving their CW capability, challenged Nixon's moratorium on the development and production of new chemical weapons.

The environmental and safety concerns that had in good part led to the moratorium were an obstacle to the production of new chemical weapons, but the hawks had a solution: "binary nerve gas". Back in the 1950s, the US Navy had been concerned about the problem of storing nerve gases on board ships, and had investigated a concept where the safety of a nerve gas munition could be improved by splitting it into two separate chemical "charges".

The US did build a 155 millimeter artillery shell to deliver binary nerve gas, in the form of GB / sarin. The shell contained two chambers, one with contained methylphosphonic difluoride, better known as "difluor (DF)", and another containing simple isopropyl alcohol. When the shell was fired, the barrier between the two chambers broke, and the rapid spin of the shell mixed the two precursors to form the gas, which was dispersed when the munition burst.

VX could also be produced from binary precursors consisting of a substance known as "VC" and sulfur. VC was actually almost the complete VX molecule, and was apparently fairly toxic and nasty in itself. The US Defense Department developed a plan for fielding binary nerve gas weapons, but even with suspicion of Soviet intentions and actions the US Congress showed no inclination to fund the program.

* The suspicions continued to grow. The USSR intervened in the civil war in Afghanistan late in 1979, and reports from Afghan mujahedin indicated that the USSR was using CW. However, although the mujahedin spoke of "nerve gas", they described clouds of colored smoke and choking symptoms that sounded more like those caused by asphyxiants. As mentioned in the previous chapter, nerve gases are generally odorless, colorless, and cause convulsions and suffocation. The reports were never confirmed. It seems plausible that the Soviets did use riot agents in Afghanistan, and riot agents can be lethal in high concentrations. The reports from Afghanistan, as well as the "yellow rain" stories from Laos provided little real evidence of any serious Soviet use of lethal CW.

By that time, however, the Soviets were not the only issue. There was widespread suspicion that lesser states with militant and authoritarian regimes were developing chemical and biological weapons as a military equalizer. That became absolutely clear after the beginning of the Iran-Iraq war in 1980. The Iraqis, badly outnumbered by the Iranians during the Iran-Iraq war in the 1980s, resorted to CW. They manufactured mustard gas; lewisite; and nerve agents, including GA / tabun, GB / sarin, and VX. They developed a "dusty mustard" that consisted of the liquid agent absorbed by a talcum-like powder, which made it easier to disperse as an aerosol and more concentrated in its effects.

The Iraqis used mustard gas and GA / tabun to spearhead attacks on Iranian forces. Poison gas appears to have been a contributing factor to the eventual defeat of Iran in 1988. It is believed the Iranians took the lesson to heart and built up their own arsenal of chemical weapons after the war. After the conflict with Iran was over, Iraq's Saddam Hussein used his chemical weapons to deal with rebellious Iraqi Kurds who had been assisted by the Iranians. The Iraqis used mustard gases, possibly combined with nerve gases, against the Kurdish town of Halabjah in March 1988, killing thousands of people.

* Incidentally, this attack became a subject of controversy in 2003, when the US government was planning to invade Iraq and held up the attack on Halabjah as evidence of the criminal nature of the Iraqi regime. Critics responded that a US government intelligence report released a few years after the attack had actually identified the Iranians as the culprits, that they had dosed the town heavily with hydrogen cyanide in a ghastly "friendly fire" accident.

However, the report was produced a group of analysts who had been promoting a containment policy against Iran and who provided little convincing proof for their assertion that the Iranians were behind the attack. Circumstantial evidence argued against this interpretation of events, since the Iranians had little or no offensive chemical warfare capability during the Iran-Iraq War; the town was clearly under the control of an Iranian-backed Kurdish force; and hydrogen cyanide is not very effective when used on open-air targets. Witnesses also clearly identified Iraqi aircraft as the delivery platform, and analyses of the town after the fact showed traces of mustard and nerve gases.

Finally, the timing of this "revelation" was suspicious, since it came forward only during a highly emotional and partisan political debate where both sides were throwing everything they could get their hands on at each other, regardless of its credibility. Accusations were similarly spread around at the time that the US had helped create the Iraqi CW program, with this claim largely based on the fact that in 1988 Dow Chemical had sold a large batch of insecticides to Iraq that might be used as precursors for chemical agents. The US government did have concerns

about the sale at the time but did not feel there were real grounds for halting it. In much the same way, US firms sold a number of other items that were not weapons as such but had potential military uses.

In reality, Iraq was buying real military hardware in massive quantities from the USSR and France, and any indirect contributions the US might have made to the Iraqi war effort were insignificant. There was in fact something of a tilt towards Iraq, with the US admittedly providing the Iraqis with selective satellite intelligence. However, although the US might have been negligent in selling dual-use materials, no evidence has come to light of any US government policy to provide the Iraqis with war materials. In contrast, it is provably known that the US provided armaments to Iran in the infamous "arms for hostages" deal.

Evidence was uncovered much later that the Iraqi poison gas program was created with help from the Egyptians, a finding that also helped confirm that Egypt had or has a highly active chemical weapons program. Of course, since Egypt is an American ally, the US has not been inclined to probe too deeply into that matter.

* In any case, during the Gulf War in 1991, there were widespread fears that Saddam Hussein would use his chemical and biological weapons on Coalition forces. The US military was not well-prepared to deal with CB warfare, and it was a wake-up call. The military used the TV news media to show to the public, and of course to Saddam Hussein, that US troops were well-prepared and well-equipped for such attacks, but it was somewhat an exercise in deception. The military was behind the learning curve and scrambling to catch up.

There were particular fears that the Iraqis would attack Israeli cities with "Scud" intermediate-range missiles, armed with GB / sarin warheads. The Israeli government issued their citizens protective gear, including gas masks for adults, a hood that covered the head and chest of small children, and plastic boxes for infants. US President George HW Bush made loud public threats that any Iraqi use of chemical and biological weapons would be met with massive retaliation. The nuclear option was not stated as a possible response, but it wasn't ruled out either.

For whatever reasons, Saddam Hussein did not use any of his weapons of mass destruction. After the defeat of Iraqi forces, UN inspection teams destroyed many of Iraq's chemical and biological weapons stockpiles, but doubts remained that all those stockpiles had been found. Those doubts would have major consequences.

The US Army now takes CW very seriously. US military forces are equipped to deal with such attacks, and incorporate CW attacks into their training. Hand-held and vehicle-mounted chemical agent detection instruments are available, and used in field operations. Advanced defensive technologies under development include vaccines to protect soldiers against nerve gases, and "hyperspectral imaging (HSI)" sensors to allow the remote detection of chemical agents from small robot aircraft. HSI sensors have demonstrated some ability to give advance warning of chemical weapon attacks, though such sensors have so far not been able to distinguish dangerous biological agents from, say, airborne pollen.

* While Saddam Hussein put poison gas back on the list of operational military weapons, the collapse of the Soviet Union in the late 1980s and early 1990s did lead to a major step forward in controlling chemical weapons. The Russian Federation that emerged from the collapse of the

USSR had no money to pursue chemical weapons development, and the chemical weapons stockpiles on its territory were a dangerous environmental liability. Under such conditions, the Russians and Americans came to an agreement in 1992 to destroy their chemical weapons stockpiles.

Putting this commitment into action proved difficult for the Americans. The traditional means of disposing of chemical weapons was to put them on old cargo ships, take the ships out to the deep sea, and sink them. This practice was continued into the 1950s, with ships sunk everywhere from the Baltic to the Pacific, but with the rise of environmental consciousness scuttling had become completely unacceptable by the 1960s. In fact, a number of fishermen were injured every year while trawling in waters where chemical weapons had been discarded, when they came into contact with crusted clots of mustard agent that were stuck in their nets. With the end of ocean dumping, the number of such incidents declined in the 1970s and faded out.

The US built a specialized incinerator on Johnston Atoll in the middle of the Pacific as a pilot plant to demonstrate the safe destruction of chemical munitions. More incinerators were to be built at all of the chemical weapons storage sites in the continental US for local incineration of the 33,000 tonnes (36,300 tons) of agents stockpiled, since transportation of the agents for destruction elsewhere was ruled out.

The plan, however necessary, proved troublesome. Many of the chemical weapons were becoming leaky and dangerous to store or transport. Opposition from local groups and environmental organizations such as Greenpeace complicated government disposal plans. Initial cost estimates for the disposal of American chemical weapons were in the billions of dollars, and proceeded to double while schedules slipped well past the end of the century.

The Russians, who did not have anywhere near the resources of the Americans, were confronted with an even nastier problem. The Americans have provided funds to help build a chemical weapons incinerator in Russia. It can destroy 500 tonnes (550 tons) of chemical agents a year. Since Russian stockpiles are estimated at 40,000 tonnes (44,000 tons), obviously other installations will be required.

The hidden costs of chemical weapons continue to mount. When the Japanese pulled out of Manchuria at the end of World War II, they left behind chemical weapons stockpiles that remained intact, if increasingly rusty and leaky, 50 years later. The Japanese government made commitments to China to spend huge sums to build an incineration facility and dispose of the ancient munitions.