Biological Warfare: the incubation period

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(1,378 words)

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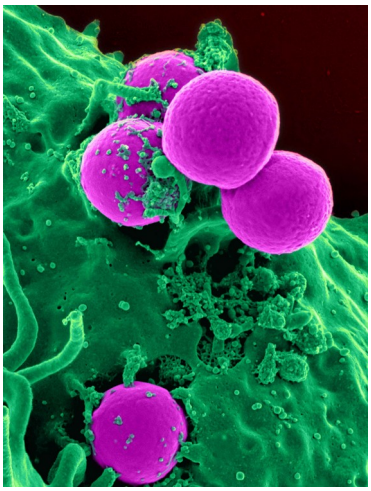
Openness as an attack vector -

An early, well known and highly-effective use of biological agents as weapons of war was by the Mongols at the city of Caffa[1]. Gabriele de' Mussi left an account of the event: Caffa was a port city being besieged by the Mongols in 1346, when an outbreak of plague broke out among the Mongols who were laying siege to the city, whereupon the Mongols began "falling on all sides as if thunderstruck"[2]. The Mongol corpses where then "placed upon [the Mongols] engines and thrown into the city of Caffa"[2].

It is possible that the European Black Death technically began with this event, and it's arrival was punctuated when a horde of infected sailors, along with their accompanying rats and fleas, arrived in the port town of Messina, Italy[3]. From there, the gram-negative bacterium *Yersinia pestis*, was spread by ships to infect the entire Mediterranean Basin[1]. The spread by ships occurred due to contact with infected sailors or rat and fleas either on-board the ships, or after some would disembark at port, spreading plague as they went port to port[3].

Exposure -



The Native American population of the United States experienced dreadful outbreaks of disease when exposed to European diseases by European traders and explorers, to which the Native American population had no immunity due to a lack of previous eposure[4]. However, as noted above about Caffa, not all outbreaks of disease are by accident; Lord Jeffrey Amherst, a General in the British Army during the French-Indian War, distributed blankets that

worked as fomites for smallpox, as the blankets had previously been used by smallpox patients at a British hospital[5]. From letters written by Lord Amherst, and letters written to him, it is clear that he was aware that the disease may spread this way, and he was more than willing to give it a try[5].

While reports of using biological agents to intentionally cause disease are relatively sporadic in the historical record, it seems likely that for every reported attack there are more attacks not accounted for for any number of reasons, e.g.: 1) symptoms caused by biological weapons could be believed to be a natural outbreak 2) the victims all died and the attackers weren't talking, 3) some victims survived but were scarred and maimed to such an extent from the disease that almost no one would talk to or believe them, or 4) maybe the attackers all died right along with their victims and there was no one left to tell the tale (a great case of dying by the sword you wield).

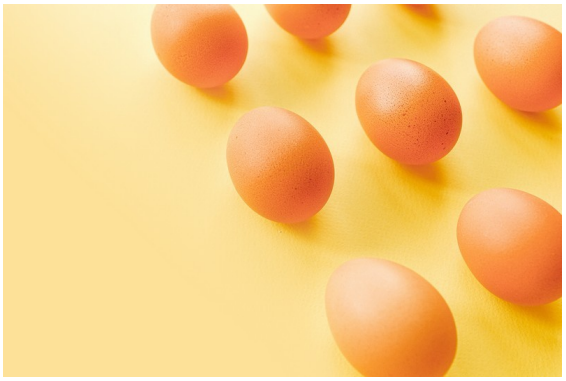
Angles -

The scientific pursuit of biological and chemical agents as weapons of war began in earnest early in the twentieth century, and World War I saw the first large scale use of chemical weapons[6]. By 1925 the powers of the world had seen enough and signed the Geneva Protocol, banning the use of chemical and biological weapons[7].

Of course the signing of the protocol did nothing whatsoever to actually stop the continuing research into bio-weapons, e.g. in 1928 the Russian "governing Revolutionary Military Council signed a secret decree ordering the transformation of typhus into a battlefield weapon"[8]. By 1938, Joseph Stalin's Commissar of Defense, Marshal Kliment Voroshilov, made the seemingly contradictory statement that while the Soviet Union intended to honor the Geneva Protocol, the Soviet Union also stood ready to respond with bio-weapons against any enemy that used those weapons against the Soviet Union[8].

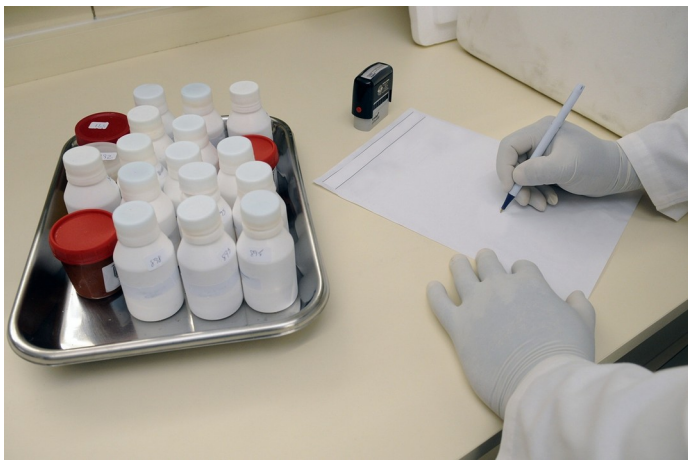
Japan, during the years 1932-1945, conducted full-blown human experimentation with biological agents on American POW's and Chinese nationals[9]. At the end of the second world war, Japanese scientists, in particular the head of the dreaded Unit 731 Shiro Ishii, were granted immunity from

war crimes prosecution in exchange for the information they had pertaining to bio-weapons and human experimentation[10].



By 1972 the world thought it might collectively try again to ban offensive biological weapons, as it had in 1925, but this ruled out only offensive deployment weapons or the research for such offensive deployment weapons, but does nothing to stop the general research of biological agents for defensive weapons[8]. For example, Vladimir Pasechnik and Ken Alibeck worked in the Soviet bio-weapons program, which was a highly extensive research group working with such things as: Tularemia, Anthrax, Ebola, and the Marburg virus, sometimes using nothing more sophisticated than eggs, wax, and an incubator[8].

While the U.S. was also doing its' own biological research at Plum Island Animal Research Center – PIADC[11], they too were working only on defensive biological weapons research, but, as "Jay Jacobson, an infectious-disease specialist and epidemiologist at the University of Utah School of Medicine in Salt Lake City [said]: 'It's like testing a vest against bullets. You first need to have the bullets.'"[11]. In other words, in order to conduct defensive scientific biological weapons research, one must first create offensive biological agents against which a defense must be mounted. Furthermore, Keith Yamamoto at UC San Francisco stated that "using gene cloning destroys the distinction between offense and defense, and gives a loophole in the 1972 treaty,"[12].



Nations which can afford active biological weapons research, and who also have any notion of being a global power player, do in fact have biological weapons at their disposal[8], and a cornered

nation will panic like a cornered animal, and then proceed to use any weapons at their disposal against an aggressor posing an acute existential threat.

Necessity -

The need to conduct bio-weapons research rests partly with the fact that France included a formal exception in its signing of the Geneva Protocol in 1925, the substance of which stated that France could and would maintain a defensive bio-weapons research program so that if it were attacked with bio-weapons it could respond in kind[7]. France's exception created an international bio-weapons environment of no-first-use, not even a pretense of an outright ban[7].

Therefore, it is imperative that intelligence be gathered about adversaries bio-weapons research, and that internal research be done to match an adversary so that one can not only defend against bio-attacks (vests and bullets), but also stay far enough ahead of adversaries to be a viable existential threat to them, otherwise treaties can break down and international political negotiations can become rather one sided.

Gene manipulation -

Human beings have been altering the genes of plants and animals through "artificial selection" for thousands of years[13]. In the 1970's, genetic engineering in the modern sense began to take shape; it is, in its simplest sense, the splicing of segments of DNA from one organism and putting that

segment or segments into the DNA of another organism, thus creating an organism that did not occur through natural selection processes[14].

Science has " transformed the four letters of DNA—A (adenine), C (cytosine), G (guanine), and T (thymine)—into the ones and zeros of binary code", and DNA segments can be synthesized without having an original[18]. The information needed to create anything from polio to the 1918 Influenza virus can be obtained through a number of means, including the Dark Web[15].

Sooner rather than later, the lab work needed for the final step in actually making a complete DNA strand from digital instructions, often written in computer languages created for the purpose, e.g. BioPerl and Biopython, as these languages include code that is designed for this exact type of DNA manipulation[16], will be totally automated[17]. Thus, ***just like a modern clothing designer never needs to visit a factory, neither will a bio-weapons designer ever need to visit a lab, or be a human being, as novel pathogens will be generated in the tangible space by the instructions sent by artificially intelligent systems***.

We better hurry up -

It has been said that “the emerging gene synthesis industry”is creating an environment in which the use of relatively “inexpensive equipment, and college-level chemistry and biology”can generate weapons invisible to the naked eye, but whose effects will be truly terrifying[18].

If Covid-19 taught us anything, it is that whatever strategies and methods we decide to use to combat the coming wave of weaponized gene manipulation, we need to start using them now instead of reacting later. Considering the resistance to mRNA vaccines, and the emergency use of new vaccines generally, it’s going to be an uphill battle.

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