**NOANYIE GRACE**

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**WEAPONS OF MASS DESTRUCTION**

**Nuclear weapons** stand apart in the public imagination because of their horrific and unmatched destructive power: an all-out nuclear attack could annihilate billions of people within hours. For this reason, some argue that nuclear weapons should be distinguished from all other types of weapons of mass destruction

**Chemical weapons** are notable because of the widespread and longstanding commercial and military experience in manufacturing their constituents. Especially compared with nuclear weapons, chemical weapons are considerably easier and cheaper to manufacture. Many dangerous chemical constituents and so-called precursors of chemical weapons are currently commercially available. An international agreement banning chemical weapons, the Chemical Weapons Convention (CWC), entered into force in 1997. The treaty requires signatories to destroy existing stockpiles of chemical weapons and, as of the end of 2005, at least 2 million chemical weapons and 12 million metric tons of chemical agents have been destroyed and 175 countries have signed on to the agreement.

**Biological weapons**, which make use of lethal bacteria, viruses, or toxins, are distinguished by their profoundly uncontrollable nature: once unleashed, a biological agent such as smallpox can spread quickly to cause an epidemic in human populations. Although biological weapons are highly dangerous, they have only rarely been used in war or in terrorist attacks. There are growing concerns, though, about the likelihood of future use of biological weapons in light of the dynamism of biomedical technology and advances in the field of biotechnology. The technologies available to create and disperse biological agents are becoming more sophisticated and widely available.

**How Nuclear Weapons Work**

Nuclear weapons, like conventional bombs, are designed to cause damage through an explosion that releases a large amount of energy in a short period of time. In conventional bombs, the explosion is created by a chemical reaction, which involves the rearrangement of atoms to form new molecules. In nuclear weapons, however, the explosion is created by changing the atoms themselves, either by splitting them or fusing them together to create new atoms.

there are two main types of nuclear weapons: fission weapons and fusion weapons.

**Fission weapons**: In fission weapons, atoms are split. The core of a fission bomb is made of either plutonium or highly enriched uranium. Plutonium and uranium atoms are both heavy, meaning they have a large number of protons and neutrons in the nucleus. During fission, when the heavy nucleus splits into two smaller nuclei, extra neutrons are released. If these neutrons are absorbed by other nuclei, they can, in turn, split, also releasing neutrons and setting off what is known as a chain reaction.

**Fusion weapons**: In fusion weapons—often known colloquially as hydrogen bombs—deuterium and tritium, two isotopes of hydrogen, are fused together to create heavier atoms. This is the same reaction that occurs in the center of the sun. Fusion can only happen at extremely high temperatures and pressure. In a fusion weapon, such a state is created by using a fission explosion (i.e. an atom bomb) to trigger the fusion reaction.

**Effects of Nuclear Weapons**

To understand the effects of a nuclear weapon, it is important to realize that a nuclear explosion produces several distinct forms of energy that each has its own devastating set of consequences: blast, thermal radiation, electromagnetic pulse, direct nuclear radiation, and fallout but all cant be explained.

**Blast**: The rapid release of energy in an explosion creates a shock wave equivalent to several thousand pounds of pressure per square inch (psi), enough many times over to crush most objects on earth.

**BIOLOGICAL WEAPONS**

Biological weapons include a daunting array of potentially deadly pathogens and toxins that can be delivered in a ariety of ways. The threat ranges from the intentional poisoning of food in the form of salmonella, to the aerosol dispersal of a genetically-engineered strain of a highly infectious disease such as smallpox. we face a truly transnational threat of unknown dimensions that we are currently ill-suited to address. The deadly anthrax attacks in the U.S. mail in the fall of 2001, as well as documents seized by U.S. military forces in 2002 from Afghanistan showing Al Qaeda's interest in BW, have served to heighten concern about bioterrorism. Biological weapons are relatively inexpensive and easy to produce. A primitive version of a BW can be developed in a small laboratory with readily available equipment with only limited training and expertise. Yet there remain significant technical barriers to developing and maintaining a sophisticated BW program. With this in mind, it is important to increase awareness and understanding of the dangers without unduly heightening public anxiety and fear. Biological weapons can be deployed in three ways: by contaminating food or water supplies, which are then ingested by the victims; by releasing infected vectors, such as mosquitoes or fleas, which then bite the victims; or by creating an aerosol cloud, which is then inhaled by the victims. With expertise and experience in developing BW agents, it is possible to produce and deploy a BW arsenal within a few months, making long-term stockpiling of large quantities of BW agents unnecessary.

**The Chemical Weapons Convention**

The Chemical Weapons Convention, or CWC, prohibits the development, production, stockpiling, acquisition, or transfer of chemical weapons. A remarkable accomplishment, the CWC is the first disarmament agreement negotiated within a multilateral framework that provides for the elimination of an entire category of weapons of mass destruction under universally applied international control.

**CHEMICAL WEAPONS**

Chemical weapons use toxic chemicals to kill, injure or incapacitate an enemy. Chemical weapons can be produced relatively easily and the equipment required is widely available.

Today, 175 nations have signed an international treaty prohibiting the development, stockpiling or use of chemical weapons. This agreement reflects a consensus view opposing the use of chemical weapons and commits states to destroying all existing arsenals. Although behind schedule, states are slowly undertaking to neutralize and dismantle their declared CW. Nonetheless, large stockpiles remain, containing over 71,000 metric tons of extremely toxic chemical agents. In addition, a handful of states are suspected of maintaining secret CW stockpiles and are believed to be pursuing ongoing research programs, including: North Korea, Israel, Iran, China, Syria, and Egypt.