

NON-LETHAL DISABLING WEAPONS

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New Military Technologies

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The new war is fought on two fronts. Even though there is only a thin inlet that divides them, there is an insurmountable distance between them that separates two universes. On the one side, death follows in everyone's footsteps; on the other side, hailstorms of news reports explode over virtual communities locked into huge numbers of sitting-room bunkers. Elsewhere, regrets, tears and drops of sweat are quick to flow far away, into the background, in pursuit of new emotions, new products, new alienation.

There are sea coasts where on one side the Ustasi cutthroat will always end up getting soiled by all his offenses, this unmentionable murderer whose banal logic of terror cuts a poor figure in comparison with the great murderers capable of sophisticated, elegantly high-tech slaughter. With one eye attentive to marketing and the opening of the Stock Exchange, on the other side of the same sea, a very neat pilot will emerge from the cockpit of his jet and will not even need to shower or change clothes in order to attend the daily press conference: the inevitable and appealing "point of the situation" complete with technical details and illustrious commentators, and the protagonists – much more sportingly than in the Sunday Sports page where throats are cut over the interpretation of every little move – will admit the inevitable, video-registered errors, with regret, and with official excuses for every unintentional carbonization.

The new war is the war of sophisticated techniques, just and strong in its reason. The new war is the war of images that supplants all reality; it is the war of civilization that drives out, controls or sanctions the barbarism that surrounds the West. Or perhaps it is the disguise for the customary old war: of strongholds that govern their interests with weapons when they don't have other tools available; and vast numbers of human beings press on the walls of the citadel, daily causing the masters who dwell there to dread them and curse.

A revolution in the way war is waged occurs when a society is transformed, forcing its military structures to change at every level, shattering the balance of war-making power in the world. The concept of a Revolution in Military Affairs (RMA) is based on the assumption that the process of technological innovation has the capacity to shape "military revolutions", singling out technology as the principle protagonist in the transformation of the basic rules of the art of war.

The current transformation of military technology is in course and is led by the United States. Starting from the Gulf War, the factors that drive it are: the process of technological innovation, the reduction of defense budgets, "demographic factors" and the "CNN effect".

The cuts in military expenses due to economic contingencies leads to reduced professional armies, to small units that are more flexible and have greater firepower. This is supported by enormous increases in the effectiveness of the new generation of war tools.

Technical progress in the armed forces is being developed mainly in these areas: the development of sensor technologies, increasing capacity to carry out precision attacks deep within enemy territory, the war of information and strengthening of the capacity for dealing with great masses of information, and disabling technologies.

The element that introduces a factor of discontinuity, causing talk of a revolution is the fusion of these aspects into a system that is able to coordinate and synthesize the ensemble of techniques for the management of military operations. In other words, it is not so much the increasing precision in the capacity to strike enemy forces that is generating a change of scale as the fusion of this capacity with the ability to gather, select, elaborate and distribute great masses of data, and with the ability to immobilize enemy forces through the use of non-lethal weapons.

Thus, the four elements of the RMA are united in such a way as to generate a change that is not merely quantitative, but rather, and more significantly, qualitative. It allows a precise global vision of the battlefield, creating the capability for striking the neurological points of the enemy in real time.

What are non-lethal weapons?

Non-lethal weapons are instruments that can be used to subdue the will of the enemy without necessarily destroying his living force. They are therefore “disabling weapons” devised for disabling people or material instruments rendering the possibility of causing permanent damage minimal, but without guaranteeing that these weapons are always harmless.

So the effectiveness of a non-lethal weapon is inversely proportional to the probability of causing permanent damage and directly proportional to the probability of disabling the objective.

Their disabling power should have a variable level of “incapacitation” in order to be adaptable to the different tactical situations in which it might be employed.

On the military plane, these weapons inaugurate a new way of using violence that permits the defeat of the adversary without the physical destruction of its forces. They are characterized by an elevated technological level – using a wide spectrum of technologies: optic-electronic, acoustic, chemical and biological, cybernetic, kinetic – and are coming out from the conceptions of science fiction in order to enter our daily lives. They will take on the following functions: control and prohibition of specific areas, riot control, large-scale military operations, enforcing sanctions, anti-terrorist actions, preventative actions against weapons of mass destruction, prison riots, crowd control at stadiums and sports arenas, evacuation of buildings.

“Operations other than war” and the development of non-lethal weapons

The epoch of the nuclear dead-lock is over; a period that is militarily more dynamic, characterized by the so-called “logic of disorder”, has begun. It consists of

the proliferation of non-state actors, like the drug cartels, the globalization of the arms market, the tendency to intervene increasingly in the internal conflicts and the humanitarian and ecological catastrophes of the lesser states. In order to intervene in these contexts, the concept of operations other than war where the political objectives of military action are dominant, where unity of action is created by coordinating states and armies with non-governmental organizations and international organizations. Non-lethal weapons become useful in this context where the role of the army and that of the police blend into each other, where the restrictions of the rules of engagement and the “CNN effect” limit the use of conventional weapons.

The young and promising career of non-lethal weapons

The important moment of acceleration in the process of the development of non-lethal weapons in the United States was during the Gulf War, for example with the vast employment of Tomahawk missiles outfitted with graphite heads used against Iraqi power stations during the first night of bombing. However operation United Shield (for the withdrawal of UN troops who had been stationed in Somalia for operation Restore Hope) was the first “operation other than war” in which the United States made use of a strong non-lethal component for riot control. The trainings held by Marines prior to the United Shield mission aimed to analyze the principles of riots in order to reverse their escalation.

The well-known events surrounding the [Branch Davidian] sect in Waco, Texas, and its tragic conclusion, on the other hand, are one of the first significant episodes in which the police made use of unspecified non-lethal weapons besides tear gas, which ultimately did not prevent them from slaughtering the besieged group.

Following this episode, the director of the US Department of Justice (DOJ), Janet Reno made a demand to the CIA and the Pentagon to get involved in common research for new and more effective non-lethal weapons to be employed in both military and police operations. This led to a memorandum of agreement between the DOJ and the Department of Defense (DOD) in favor of the development of disabling technologies of a dual sort.

The realization of this program of collaboration was entrusted to the Defense Advance Research Project Agency (DARPA) under the supervision of a Joint Program Steering Group.

The National Institute of Justice (NIJ) is developing a study of the physiological responses to some non-lethal weapons. The objective of the research is the development of disabling technologies with completely inter-changeable effects capable of temporarily incapacitating a single individual as well as a group of people.

Another project currently being developed by the NIJ at Sandia National Laboratory relates to the effects of sticky substances on human skin. The aim is to develop a projectile containing foam form calming prison riots.

In March 1994, the new Secretary of Defense, William Perry, instituted the “Senior Advisory Group for Low Collateral Less-than-Lethal Weapons” with the task of developing a plan for the elaboration of a doctrine for the employment of non-lethal

weapons. A few months later, on June 23, 1994, an even more authoritative confirmation of the American will to develop these new weapons came directly from president Clinton who declared in a letter to the Senate for the ratification of the Convention on chemical weapons that he would address the Secretary of Defense so that the efforts in the development of non-chemical and non-lethal alternatives to chemical agents for the control of riots would be incremented.

The program of the American DOD for the development of disabling technologies can count on an annual budget of 25 million dollars for research and development alone. This figure doesn't include the portion of the costs in the counts for specific weapons relating to the acquisition of completed systems.

War in the city

Disabling, non-lethal weapons could reveal themselves to be effective tools for those armies that will increasingly be compelled to fight in complex contexts like urban areas in the near future. Now, cities are one of the main scenarios within which the armed forces will have to operate. (According to United Nations estimates, by 2025, three fifths of the world population will live in urban areas).

"[...] The urban context is characterized by the presence of an intricate network of structures of various kinds interconnected by communication systems that are developed on at least three levels: a subterranean level, ground level and a higher level. All this notably curbs the capacity for the movement of troops and vehicles, hinders communications and limits visibility. Population density makes it difficult to operate at its interior, minimizing the probability of creating victims. The presence of debris, structures and other simple shelters for hostile elements often make the deployment of increased fire power in these zones necessary. On the other hand, the presence of non-combatants makes the deployment of weapons with a reduced lethal capacity necessary [...]"

In these situations of urban war that are foreseen in the near future, the military or the police might find themselves in difficulty, trying to deal with war-trained insurgents who exploit the urban structure to their advantage; besides, public opinion and the rules of engagement limit the use of means available to them.

The use of disabling, non-lethal weapons is indispensable for effective management of military operations in this context. In fact, non-lethal weapons have a high capacity for penetration. They could easily overcome the obstacles of the urban context (walls, underground passages) and their reduced lethal capacity permits their more indiscriminate deployment over a wide radius.

Duality

The appearance and increase of missions "below" the level of classical war lessen the traditional distinction between the army and the police. There is a close collaboration between the Department of Defense and the Department of Justice in the US for the development of non-lethal weapons (in the United Shield mission, non-lethal weapons from the police arsenal were employed).

With this in mind, non-lethal weapons and systems for their use are being developed that can be employed by both the armed forces and the police.

Duality is the main characteristic of these weapons. It consists of the ability to modify potency in accordance with the situations in which they are employed.

Thus, these technologies are developed to be reversible: usable by the police and the army, capable of being transformed from non-lethal to lethal weapons, or to weapons of torture.

The CNN effect

In “operations other than war”, the killing of civilians could call the continuation of the mission into question. For this reason, disabling weapons are important due to the fact that they are specifically “media-friendly” weapons. Their employment must be introduced within a “communicative strategy that is effective because it can be conclusive from the operative point of view”.

They are capable of disabling the objectives without causing any visible damage. Thus, since there is no destruction, there is also no visible evidence of the disabling that occurred.

In Turkey and Indonesia, military vehicles have been disguised as ambulances for riot control in order to hide the crafts of the armed security forces. In Indonesia, varnish is regularly sprayed on demonstrators. This method marks the demonstrators for a week, allowing security forces to arrest them later, far from media eyes; this further permits them to make use of the more traditional techniques of repression: interrogations, torture, execution.

Effects of non-lethal weapons

Non-lethal weapons are being developed for precise tactical purposes.

According to the best theories regarding these weapons, they are not required to avoid causing victims, but to limit collateral effects, i.e., permanent damages and “accidental” deaths.

Non-lethal weapons are developed to be as rheostatic as possible. In other words, they are made in such a way that the instrument or ensemble of instruments that form a system could guarantee the quick passage to different levels of use by the armed forces, i.e., so that these instruments could be modified in order to become fearful lethal weapons. The theories of utilization always foresee them being used in combination with traditional lethal weapons, insofar as disabling weapons cover certain functions, such as the safe evacuation of people from a building, in which traditional weapons are less efficient.

Besides, the most likely military uses of these weapons would be “pre-lethal”. They would serve to disable the enemy who would then be more easily destroyed.

One of the inconveniences being encountered in the introduction of these weapons is the fact that some of the disabling technologies are in danger of being forbidden by international accords. The development of non-lethal toxins is forbidden by the Convention on biological weapons. Thus, bacteria and toxins, like salmonella, cannot be used for disabling adversaries.

The convention on chemical weapons, which has been in force since 1997, forbids the military employment of any weapon that might cause death, temporary incapacitation or permanent damage to human beings or animals through a chemical action. Despite the use of chemical weapons for riot control, it is prohibited as a means of war – but the police can use them without concern.

The employment of super-glues, which were still allotted for use by American soldiers in Somalia, may be restricted because one of the chemical components could be forbidden by certain international agreements for the protection of the environment.

Many non-lethal weapons produce a great degree of environmental damage as a collateral effect. Among these the following stand out: anti-adherents, super glues, Liquid Metal Embrittlement (LME) agents, super-caustics.

In addition, some non-lethal weapons can cause serious permanent damage or effects that are worse than lethal weapons, in other words, damage that leads to death after atrocious suffering. Super-glues and other adherents can suffocate people; EMP shock-waves can make helicopters crash; infra-sound can cause epileptic seizures in people; lasers can cause blindness; the new generation of acoustic weapons may merely be annoying, but they can also be intensified to cause shock-waves that could produce potentially lethal traumas. Plastic bullets are more readily lethal than rubber bullets – England had to recall 100,000 plastic bullets in 1999. Pepper spray has been a routine tool of the American police since 1987. As of 1998 it had caused at least 114 deaths, mainly due to conditional asphyxiation. Furthermore, non-lethal weapons can be used as instruments of torture. In California, police officers held the heads of ecological demonstrators motionless, opened their eyelids and put irritating liquid directly on their eyeballs.

Ethnic conflicts have become a constant of these times. It is therefore logical that there is a project in progress that aims to develop an ethnic disabling weapon. This involves a database relating to specific odors and their meanings for particular cultures, populations, religions and geographical areas. A certain odor, for example, might be repulsive to a particular population and send a message of danger.

Technical Descriptions

Biological agents – This term refers to products of a biological nature capable of attacking materials – such as electrical cables or explosives – and rendering them ineffective.

Calmative agents – These are sedatives or narcotics that are often mixed with other chemicals in a way that guarantees absorption through the skin. They can be used for anti-riot purposes, to prevent access to specific areas or buildings and in military operations in combination with conventional weapons.

Polymeric agents (super-glues) – These are super-adhesives used to impede the capacity for movement in human beings and things. They can be used against weapons, vehicles and installations. They can be used against people to prevent movement. Thus, they have the possibility for very broad deployment.

Combustion alterations – These consist of chemical additives that contaminate or modify the characteristics of viscosity of fuels in order to degrade performance from motors to air intakes.

Anti-adherents – These are super-lubricants. They serve to notably reduce the friction of any surface making passage impossible. They can be sprinkled or sprayed on railroad tracks, ramps, streets, corridors or runways in a way that makes the passage of people or vehicles very difficult.

Canister launched area denial systems – These are grenades capable of quickly creating a non-lethal barrier in order to prohibit access to protected areas.

Electrified water cannons – These are classic water cannons with the addition of an electrical shock. They can be used for dispersing crowds.

Electrical power distribution munition (EPDM) – They are formed from spools of long filaments of carbon that are released over electrical lines and cause them to short circuit.

Multi-spectral smoke-producers – These smoke-bombs allow for control of visibility using suitable spectral window through which it is possible to see only thanks to specific optical systems.

Ground electric vehicle stopper – This is a weapon system that exploits high power electro-magnetic radiation from a source placed on a land or air platform. The main objective is to disable vehicles through the combustion of electrical circuits.

Non-nuclear electro-magnetic pulses (EMP) – These generate effects similar to those of EMP caused by a nuclear explosion without producing any thermal, mechanical or radioactive effects. The electro-magnetic energy produced by the EMP causes both physical damage (the fusion of hardware elements) and the alteration of logical circuits and the contents of the memory [of computers].

Liquid metal embrittlement (LME) – LME agents change the molecular structure of metals and alloys, seriously weakening them. They serve to make enemy materials untrustworthy.

Infrasound – These are powerful sounds at very low frequencies that can cause disorientation, nausea, vomiting and intestinal spasms when directed toward a person. They can be used against crowds or single individuals protected inside of a building. They can deny access to protected areas or protect ships from frogmen.

Isotropic radiators – These are special illuminating munitions. Their intense light causes the same sort of damage as low energy lasers. The effect they cause is comparable to what happens upon coming out of a dark room and staring into the sun.

Low energy lasers (LEL) – They use a multi-color laser. Their purpose is to blind both people and sensor systems.

Maritime vessel stopper – This is a weapon system capable of stopping ships without causing permanent damage to the occupants. It serves to control the maritime borders of a state or for reinforcing embargo measures.

High powered microwaves (HPM) – These are energy systems oriented to melt unshielded electronic systems. Within a narrow range, they can also cause temporary vertigo. This new kind of weapon can be used against command, control and communication centers, defense area sites and weapon systems.

Modular crowd control munitions – These are munitions containing plastic spheres that explode on impact, striking people in the vicinity of the point of impact in a non-lethal way. Their principle applications are in riot control and the control and prohibition of specific areas.

Non-lethal bounding munitions – These are non-lethal mines that can employ plastic spheres, irritating substances or even nets. They serve to prevent access to protected areas.

Non-lethal crowd dispersal munitions – These are non-lethal 40-millimeter cartridges for the M203 grenade launch. Applications range from riot control to vehicle protection.

Portable vehicle immobilization system – It is a fixed system used to stop vehicles of a weight not greater than 5100 pounds, that travel at velocities of 40-60 mph within 200 feet of the source of irradiation, without causing permanent damage to the vehicle's occupants.

Nets – They can be stinging, sticky or electrified. They are launched with portable systems or mounted on vehicles. They serve to block individuals, groups of individuals or vehicles.

Foams – These are liquids that expand rapidly upon contact with the air filling up the surrounding space. There are three types of foams: stiff, sticky and aqueous. Stiff foams harden very rapidly preventing movement. Sticky foams are very dense and render movement and the use of limbs difficult. Aqueous foams can be used to rapidly fill up a place.

Acoustic systems – These are systems that exploit various acoustic frequencies with the aim of provoking various non-lethal biological effects. The applications range from riot control to freeing hostages located in a building.

Visual stimulations and illusions – Visual stimulations and illusions include a vast range of technologies among which are those that use the Bucha effect and the chameleon effect. The Bucha effect involves vertigo, disorientation and nausea. It is effective in dispersing crowds of rebels and in protecting installations and specific places. The chameleon effect is useful for rendering people and crafts invisible to the adversary.

Super-caustics (+C) – These are composed of sulfuric acid at different levels of very high corrosiveness. They can be applied in such a way as to cause tires, the soles of boots, road surfaces, roof coverings or optic systems to deteriorate.

Tasers – These are electric hand weapons have a stupefying effect. They can serve both the armed forces and the police for crowd control in the case of demonstrations or the distribution of provisions.

UAV payload delivery systems – It's a matter of modifying existing UAV (radio-controlled "unmanned" aerial vehicles) crafts in order to adapt them to dispersal systems or non-lethal munitions.

Under barrel tactical delivery system – This is a system that allows a capacity for direct, non-lethal fire-power, with a range from 20 to 100 meters and can be placed under the barrel of the M16A2.

Vehicle launched munitions – These are munitions of 60mm that can be deployed at a safe distance from inside a vehicle. The primary applications relate to riot control.

Vortex ring gun – It exploits an ensemble of effects (shocks, chemical effects, luminous flashes) generated from vortices produced by combustion. The main applications are in riot control.

ADDITIONAL NOTE

(edited by *guerrasociale* – October 2002)

There is a 49-page report from the Pentagon's Joint Non-Lethal Weapons Directorate (JNLWD) entitled *The Advantages and Limitations of Calmatives for use as Non-lethal Techniques*. It is about a Pentagon research program on psychopharmacological weapons. Based on an in-depth inquiry of medical literature and of new developments in the pharmaceutical industry, the report concludes that "the development and use of calmatives [psycho-pharmacological weapons] is achievable and desirable."

The project, that is taking place at the Pennsylvania State University College of Medicine Applied Research Laboratory [also known as the Marine Corps Research University – translator], studies how to transform a series of psychopharmaceuticals and anesthetics as well as "recreational drugs" into weapons. According to the report, "the choice of administration route, whether application to drinking water, topical administration to the skin, an aerosol spray inhalation..., or a drug-filled rubber bullet, among others, will depend on the environment". The specific environments are precise military and civil situations including those involving "hungry refugees that are excited over the distribution of food", a prison, an upset population and hostages. The report on the project often goes so far as to describe dissent as a psychological disturbance.

Almost all the drugs in the tests are central nervous system depressants. Among these there are the opiates (like morphine) and the benzodiazepines (like Valium). The project is also searching for drugs that take quick action and so is quite interested in anti-depressants such as Prozac (fluoxetine) and Zoloft (sertraline). The report notes how pharmaceutical substances that failed tests for medicinal use could be employed as weapons. [...]

Among the techniques for diffusion that are discussed in the report, the following stand out: administration through the skin and mucous membrane, administration by means of aerosol sprays, micro-encapsulation and insidious systems such as introduction into drinking water supplies. The JNLWD is investing in the develop-

ment of micro-encapsulation technology that implies the creation of granules with a small quantity of the agent covered by a hard shell. Once scattered on the terrain, the shells explode under the feet and release the agent. With the help of a new mortar, every projectile can shoot out thousands of tiny granules. The researchers have expressed a particular interest in carfentanil darts to shoot against human beings. Carfentanil is a veterinary narcotic used to sedate dangerous large animals such as bears and tigers.

The Pentagon project also calls for more research on the potential of “recreational drugs”, illegal substances sometimes used at raves and in dance clubs. Among them, Ketamine, GHB (liquid ecstasy) and rohypnol interest the military. According to the Drug Enforcement Agency, in small doses Ketamine causes dizziness, ataxia, disconnected speech, slow reaction time and euphoria. In medium doses, it induces problems in organizing one’s thinking, corporeal alterations and a sensation of unreality with visual hallucinations. In large doses it causes analgesia, amnesia and coma.

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