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Ambiguous concepts and porous borders

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Efforts employed to eradicate non-conventional weapons of the enemy – nuclear, chemical, biological, radiological, and nuclear (CBRN) weapons, or special weapons – opportunely grouped together as ‘weapons of mass destruction’, have some suspicious things about them. The ambiguity of the concepts, the permeability of the classifications, and the plasticity of the doctrines seem to have no other goal than to frustrate international conventions and manipulate public opinion. The prohibition publicized for certain weapons allows the development, with little noise, of still more terrible weapons that no one wants to name, and the risk of their legalization and the justification of worse extortions is high [1–3]. All physicians are susceptible to being engaged at the initial level in case of conflict. It is therefore necessary to question the conception and utilization of high-technology weapons that do not make a great effect on civilian populations.

Conventional Weapons and CBRN Weapons

The first question one must ask is: ‘What is the distinction between conventional weapons and special weapons?’ Is the criterion a power to kill extensively or a barbaric lethal mechanism of action? In other terms, is it qualitative or quantitative? In theory, 1 kg of a neurotoxicant could kill a million persons, and 30 kg of botulinum toxin could kill 60 million persons. An epidemic of variola (smallpox) could kill millions of humans. In practice, chemical or biological weapons have not to this day responded to the expectations of their promoters and have not caused mass destruction, unlike classic bombs. The only weapon of mass destruction is unquestionably the megaton thermonuclear bomb, which is not, at this time, in the hands of countries qualified as ‘rogue’. For the physician, all mechanistic classification that relies on describing the effects or mechanisms of action of weapon systems is not only odious with regard

to human suffering, but also unfounded. The power of conventional firearms is also totally more deadly than the effects of weapons called 'special'. The carpet bombs released more than 50 years ago by vast campaigns of high-altitude aerial bombardment, that made up a part of the official doctrines of civilized countries, rival the destructive power of the CBRN weapons utilized at present, yet carrying the most atrocious conventional weapons rouses only little official reprobation.

The 'thermobaric' bombs, such as fuel air explosive (FAE), BLU or massive ordnance air blast (MOAB) bombs, had a powerful blast effect and caused the rapid disappearance of oxygen by burning a flammable aerosol product. The FAE was utilized in Vietnam and the BLU-82 bomb was utilized in Afghanistan and Iraq. The bomb BLU-82, also named the 'Daisy Cutter', weighed nearly 7 tons. It was the most powerful classic bomb in the American arsenal. In March 2003, the Pentagon tested in Florida the MOAB (also called the 'Mother Of All Bombs'), which is now the largest non-nuclear bomb in existence. This munition has a massive blast effect and weighs nearly 10 tons, and is launched from a Hercules C-130 aircraft and then guided on its course by means of a global positioning system (GPS) satellite system. It spreads a cloud of flammable product over the objective, of which the fire uses the oxygen in the air as a fuel and results in an extraordinarily powerful explosion. This bomb, which possesses a destructive power equivalent to a small nuclear device, is even qualified as 'subatomic'. Furthermore, today, the treaties and declarations of intent remain impotent to eradicate, among others, antipersonnel mines or fragmentation munitions. The cluster bomb is a fragmentation bomb that disperses, on impact or above the ground, submunitions that explode and project hundreds of fragments. This bomb has been released on civilian populations in Iraq, Kosovo, and Afghanistan. Approximately 10% of these bombs do not explode on impact and become veritable antipersonnel mines that injure farmers and children who venture into the fields. Some thousands of civilians have been killed in this way in Iraq, Kuwait, Afghanistan, and Kosovo.

On their part, terrorists, as pragmatic as inhumane, have willingly had recourse to conventional means whose efficacy no longer needs to be demonstrated – home-made bombs, vehicles packed with explosives, rocket launchers. A kamikazi who explodes himself in a public place kills more human beings than the 39 Scuds fired by Iraq into Israel during the first Gulf War. A SAM-7 missile fired by a single man can knock down an airplane on take-off and cause hundreds of deaths, while an aircraft hijacked by a small group of kamikazis can knock down a high-rise building and cause thousands of deaths. By way of comparison, the sarin gas attack in the Tokyo subway by the Aum sect caused the deaths of 12 persons on March 20, 2005, and anthrax-containing letters caused the deaths of five persons in the USA in the autumn of 2001, while attacks with explosives in Bali and Grozny caused 192 and more than 80 deaths, respectively. Timothy McVeigh did not require a 'dirty bomb' to launch the terror attack in Oklahoma City, causing 186 deaths in April 1995; a single rudimentary charge was sufficient to kill French citizens at the Port-Royal metro station; and some knives permitted the commando suicide of September 11, 2001, to accomplish a true carnage in New York City with more than 3000 victims. When there exists a very large technological disparity between existing forces, the battlefield can be displaced to the

cities and the strategies of the weak against the strong are based on terrorism. The imbalance of forces gives rise to the equilibrium of terror.

In fact, the only valid classification would be one that takes into account the suffering inflicted on human beings. But how about a thermal burn from a conventional weapon or a burn by microwave weapons? Could it be less disturbing than a chemical burn from a chemical vesicant agent? How about a bomb that depletes oxygen, such as the FAE, the BLU-82, or the MOAB, creating a veritable gas chamber in the open field? Is it more tolerable than a cyanide bomb that blocks the utilization of oxygen? How about a retinal burn from a combat laser? Is it more 'conventional' than a corneal burn from sulfur mustard? If a burn or toxicology specialist can establish pathophysiological distinctions, it is less probable that the victim can make the same distinction, and for the physician it is not a conventional matter to destroy a human being. Furthermore, the mechanisms of action of the last-generation weapons, coming from the laboratories of countries, are classed as 'secret-defense' (in reality 'secret-aggression') weapons. These non-classified weapons need only time to benefit from passing for conventional weapons, preserving the secrets of their fabrication and increasing their power of terror and deterrence. The strong have bet on the fact that unconventional weapons of tomorrow will not be weapons banned by the conventions, but weapons compatible with being 'outside of convention' by virtue of their secret and indescribable technology.

The radioactive and nuclear (RN) weapons of the last generation are not even mentioned in treaties, which is also the situation for miniaturized nuclear weapons with selective effects, high-power microwave weapons, or particle beam weapons [4–6]. In playing on the miniaturization of nuclear weapons and modulating their effects, it is possible to maintain them in a twilight classification favorable to the violation of all the conventions. The new generation of miniaturized nuclear weapons, such as the Robust Nuclear Earth Penetrator, or 'mini-nuke', can deliver an energy of less than 1 kiloton (in the range of hundreds of tons). Let us recall that the power of the bomb at Hiroshima was 15 kilotons. The designers of the B 61-11 nuclear bomb put forward a light version (0.3 kiloton TNT equivalent), but remain discreet about the higher-yield version, equivalent to several times the power of the bomb at Hiroshima. This plutonium-based device, supposed to explode 30 meters underground, was developed in total infringement of the Nuclear Non-proliferation Treaty. What can be said about the situation where the threshold for legal proscription is situated beyond that at which an anti-forces weapon becomes an anti-cities weapon, or where a tactical weapon becomes a pre-strategic and then a strategic weapon? It is thus possible to pass imperceptibly from a 'subatomic' weapon to a subkiloton atomic weapon (or hundred kiloton weapon), and then to a megaton weapon.

Concerning biological weapons, the progress of genetic engineering permits from now on the sequencing and manipulation of the genomes of biological agents pathogenic for humans [7,8]. Faced with an emerging virus, such as influenza or an atypical pneumonia, it would be difficult to distinguish between a natural epidemic and the spreading of a militarized pathogenic agent. An infectious agent can be transported in several hours from all over the planet by a traveler: West Nile fever was installed

in the USA and new strains of Dengue fever imported from Asia colonized South America. Crimea-Congo hemorrhagic fever and Ebola fever represent a permanent danger in Africa. So-called 'fourth-generation weapons' could be developed in countries' laboratories, possessing some effects which initially would be difficult to detect, indescribable or unclassifiable. Biological weapons would probably not disseminate plague or smallpox. They could have effects more and more selective on certain functions, particularly cerebral, some effects more and more subtle and, we are tempted to say, more and more 'natural'. They could strike targeted ethnic groups, inactivate very precise genes, and set in motion physiological cell death (apoptosis). Which treaty decries these effects? What convention prohibits them?

Chemical weapons benefit equally from the porosity of the classifications and technological progress. The militarization of medications which followed the militarization of biological agents constitutes a new awkwardness forced on the physician. An emerging concept is that of 'assault medications' placed in service for counter-terrorism to be a halfway-house between an anesthetic gas and a combat gas. Chemical weapons of the future may perhaps already be hidden in the Vidal® Dictionary of Medications. These weapons, presented as non-lethal, in reality possess a lethal power in two ways: it is a matter of paralyzing the enemy before executing him. During the taking of hostages in Moscow, which caused at least 117 deaths (hostages not included), the essential problem was to understand whether the product utilized was, yes or no, proscribed by the International Convention on Chemical Weapons. If it involved a halogen or opioid product, its use would be legal and the drama of the theater on Doubrovka street could be classified as a therapeutic hazard, the prescribers having made an error in dosing. These series of 'pass-pass' technologies and semantics allow the threshold critique of proscription to be erased, passing on to a binary system of armament systems (authorized weapons/proscribed weapons). We emphasize here the hypocrisy of 'non-lethal' weapons. The use of irritant or incapacitating agents, qualified as 'non-lethal' weapons, is proscribed by the International Convention on Chemical Weapons. Riot control agents cannot, therefore, be employed as weapons of war. We come to see that the 'non-lethal' character of these weapons is subject to caution. During the Vietnam war, irritant agents were dispersed before aerial bombardments in order to dislodge the Vietnamese infantrymen from their shelters. It was therefore not a matter of limiting human losses but, on the contrary, of increasing the fatal efficacy of the air raids by depriving the enemy of his protection. The American Secretary of Defense, Donald Rumsfeld, justified recourse to such weapons in his speech on February 5, 2003, to the House of Representatives Armed Forces Committee. Rumsfeld declared:

'We are in a very difficult situation. Our forces are authorized to shoot at people and to kill them, but not authorized to utilize a non-lethal agent for combat control. It is an embarrassing situation. There are some moments where the usage of non-lethal agents is perfectly appropriate, when it is necessary to transport prisoners in a confined space, in an aircraft for example, or for example when enemy troops are in a cave in Afghanistan and you know they have their women and children with them.'

It was at one time more a matter of paralyzing the enemy, of blinding or disorienting them before striking them. In the same fashion, combat lasers which blind the enemy by causing retinal burns are declared 'non-lethal' by the Pentagon. They only prevent the adversary from utilizing his weapon. A person can only ignore what happens to a combatant blinded when facing his enemy. A thousand leagues from all forms of compassion or humanity, it is a matter of substituting some technological processes for the human suffering and some words for facts. Must it be necessary to hunt for the category of conventional weapons, the homemade bomb packed with nails or small shot and accept in the same category 'non-lethal combat control agents', combat lasers, microwave weapons, and particle beams?

To add to the confusion, recall that conventional weapons are likely to be used to release non-conventional agents. Bombardment of an industrial site by means of conventional bombs can set in motion a contamination (chemical, radiological, or biological) of the environment, with catastrophic public health consequences. The administration of Bill Clinton envisioned, in the 1990s, bombarding the North Korean nuclear reactor at Yongbyon. During the first Gulf war, allied aviation bombarded many Iraqi NBC armament sites: the nuclear armament site in Tuwaitha, the biological armament site in Taji, and the chemical armament site in Falluja. In the course of the war against Serbia, NATO did not hesitate to bomb the petrochemical complex of Pancevo, liberating products as toxic as certain combat gases. This confusion of effects can be put to profitable use for concealing the use of non-conventional weapons in the cadre of 'preventive strikes'. In effect, who can say whether the contamination observed following a bombardment is due to the bomb dropped or to the bombarded site? Above all, if one takes precautions, before the strike, to convince international opinion that the target country has available in its territory numerous sites with non-conventional weapons! Not to be outdone, terrorist groups have available at low cost a sort of binary weapon, because a classical explosive charge can liberate CBRN agents from a nuclear center, from a protected biotechnology laboratory (a P4 laboratory), or an industrial chemical site.

In the end, one can ask how setting a classification of weapons serves to elaborate conventions that are systematically distorted or violated. In making a range of miniaturized nuclear and launching devices the focus of a recent program of anti-ballistic missile defense, the USA also distorted the Nuclear Non-proliferation Treaty as well as the 1972 Anti-Ballistic Missile (ABM) Treaty. In opposing all procedures for verification in its territory in the context of the 1972 Convention for the prohibition of biological weapons, it rendered this convention inapplicable. Some other countries who were signatories to this Convention pursue programs of offensive research on materials of biological weapons under cover of 'defensive research'.

'Surgical strikes' and weapons of mass destruction

A second question should not be eluded. Modern high-technology weapons – are they instruments of precision, contrary to weapons of mass destruction, which seem to be

held exclusively by the enemy? The war rhetoric, which repeatedly has recourse to the medical vocabulary, does not clarify the debate. According to this rhetoric, intelligent weapons allow the operation of 'surgical strikes', of striking the objectives while limiting the adverse effects. This can be compared to an electric scalpel, whose intensity is regulated in such a way as to excise pathological tissues without damaging the adjacent healthy tissue. If 'pathological tissues' represent a blow to the enemy forces, the 'healthy tissues' in general represent the hand that holds the scalpel; NATO says otherwise, as does the civilian population of the bombarded country. In recent wars, we have learned that the border between anti-forces strikes and anti-cities strikes is poorly drawn and tortuous. Not only are civilian populations not spared, but they can be the admitted targets. In the course of wars in the second part of the twentieth century, the percentage of civilian victims rose from 10% to 90%. The 'conventional' bombardment of Dresden and the 'non-conventional' bombardment of Hiroshima were comparable in horror. The Mitchell doctrine, in force since the 1930s, makes massive aerial strikes preliminary to all American military attacks. The strategic aerial bombardments above all destroy civilian and industrial installations, leaving intact a great part of the military potential. NATO rules of engagement impose the practice of high-altitude bombardments (higher than 5000 meters) to protect the pilots against aerial defenses. At this altitude, it is illusory to visually make a distinction between civilians and military personnel. It is therefore at the price of 'collateral damage' that NATO forces have not sustained any losses during the latest aerial campaigns. The concept of 'zero military personnel mortality' is associated with the 'effect' of 90% civilian victims. During the war against Serbia, the Alliance openly demanded research of the 'Dresden effect', that is to say the exhaustion of the morale of a people which goes with the bombing of their apartment buildings, their bridges, their hospitals, their electricity centers, their factories, their petroleum refineries, their telephone centers, and their television relays. The distinction between anti-forces strikes and anti-cities strikes is eclipsed to the benefit of 'legitimate military objectives'. On the night of April 22–23, 1990, NATO aviation took for its target the studios of the Serbian National Television (RTS), located in the heart of Belgrade, killing 16 journalists at their workstations; for NATO, the media entered into the definition of a legitimate military objective. During the 1991 Gulf war, the supplies of potable water for Iraq were deliberately targeted. Destruction, by means of 'conventional' bombs, of a network for potable drinking water of a country is probably the most effective method for propagating natural infectious agents by the basic route of dirty water. This form of biological warfare does not strike soldiers, but rather children who die in epidemics of infectious gastroenteritis.

Economic embargos, such as those for water, take an entire people hostage and organize their deficiencies by depriving them most often of products of primary necessity, such as foodstuffs and medications. The embargo against Iraq caused more human beings to perish than the bomb of Hiroshima, taking into account the respective medical sequelae. For all these reasons, physicians consider with much skepticism the notions of surgical strikes and reduced collateral effects. From all the evidence, the ambiguous concept of 'reduction of collateral damage' is attached more to the preservation of the economic potential of a country than to the losses amongst its civilian population.

Again, it is more a matter of semantic distortion and Orwellian manipulation of the language than the cruel reality of the facts. Of course, terrorists do the same and do not hesitate to blindly strike innocent victims.

The only means of justly evaluating the human damage is to look at the victims and not to read the technical instructions for the weapons employed. High-technology weapons are presented as inoffensive for civilian populations on the grounds that they are equipped with selective anti-forces effects – inhibition of the enemy's communication systems with graphite bombs or electromagnetic bombs, better penetration of bunkers with miniaturized nuclear weapons, better penetration of steel armor plate with depleted uranium munitions. However, the high-technology weapons are a long way from proving their innocuousness. The graphite bomb, a veritable 'finger on the switch' of a country, could cut the electricity to hospitals and maternity wards, indirectly threatening the lives of hospitalized patients, as was observed in 1999. An article in a major French daily paper described the graphite bomb in this manner:

'The American weapon available is the future of weapons, temporarily switching off the electrical systems of a country. It is a matter of graphite bombs (BLU 114), utilized for the first time in 1999 in Serbia. These weapons spread carbon filaments on transformers, causing a short circuit. On several occasions, the current was switched off in Belgrade. The damages are minor, and it suffices to clean up the electrical facilities for them to resume operation.'

This journalist has probably never found himself in a hospital suddenly deprived of electricity, in particular in an operating room, an intensive care service, or a neonatal intensive care service. It appears that the damages are not 'minor' and that it does not suffice to clean up so that all operations can be resumed. And what can be said about the health consequences of inhaling graphite particles or exposure to radioactivity released from mini-bombs or depleted uranium munitions? Will there be few people who care about the health consequences, in particular the risk of oncogenic effects, for the civilian populations of sprayed regions? Must it be recalled that, during the Vietnam war, the American authorities affirmed the innocuousness of the aerial spraying of defoliants vis-à-vis the civilian populations? Furthermore, the distinction between the anti-matériel effect and the anti-personnel effect is sufficiently fuzzy for this type of weapon. By way of example, a microwave weapon can be utilized to neutralize electronic systems but it can also serve to cook human beings by adjusting the intensity.

From non-proliferation to counter-proliferation

The third question concerns the future of the Western techno-industrial society that combines aggressive strategies and technological supremacy [9,10]. We assist the passage from a defensive doctrine founded on deterrence to an offensive doctrine by multiplying innovative concepts: revisions of treaties and conventions, preventive war, counter-proliferation interference. This process was begun well before the attacks of

September 11, 2001. It is too often justified in the name of moral or humanitarian concepts. Once again, physicians have participated, voluntarily or involuntarily, in the war effort. The notion of a right of humanitarian interference together with the simultaneous dropping of bombs and a lively maintenance of confusion serves some tactical interests. In the same fashion, the USA has attacked, attacked, still attacks, and will still attack Iraq without caring about the advice of the Security Council and of the Iraqi people. It is a matter of maintaining confusion and dramatizing the threat to justify fatal preventive strikes.

Scientific progress has permitted the development of high-technology weapons. Shortly after the discovery of nuclear fission, Frederic Joliot, Lew Kowarski, and Hans Heinrich von Halban filed a patent with the title, 'Improvement of explosive charges'. In fact, firearms have been modernized with striking regularity since the Battle of Crécy, and the canons of the Black Prince were the precursors of the artillery of the Napoleonic campaigns, the Civil War and modern slaughter. In his Directive of August 30, 1941, to the Committee of the Heads of Major Countries, Churchill took a position in favor of developing a uranium bomb in the name of progress:

'Although I am for my part satisfied with existing explosives, I think that we must not make obstacles to progress.'

The physicist, Edward Teller, architect of the A bomb and designer of the H bomb, affirmed that, for him, the technology was a measure to save the free world. Today, specialists in genetic engineering rival physicists for improving CBRN weapon systems and inventing new forms of apocalypse. One could think, like Edward Teller, that the free world would be saved by technology, but one could also think, like Theodore Kaczinsky, that the techno-industrial society has involuntarily created the instruments of its own destruction [11]. A technology developed is a technology for immanent application. By its technological supremacy, the Western techno-industrial society has set in motion an imbalance of world forces that would inevitably give birth to the terrorist threat. In effect, no force, working or open, can oppose it on the classical front with comparable systems of armaments, and accordingly the concept of counter-proliferation has a view to destroy, in the enemies' countries, all potential for the production of sophisticated weapons. The imbalanced conflicts therefore go on to proliferate and no national sanctuary will be safe. Neither a vaccine against smallpox nor the ballistic anti-missile shield will prevent armed kamikazis from using means, more or less conventional, to sow terror in our society.

Faced with such threats and with such stakes, physicians must resist all manipulation. Their vocation is to denounce confusion of types and refuse to place at the disposition of the war makers their vocabulary, their medications, their designs, or their staffs. They must refuse to participate in offensive research under cover of defensive programs, and oppose themselves to the instrumentalism of humanitarian interference with the aim of transforming this latter into an agent for military interference. Nevertheless, on the occasion of recent conflicts, few physicians expressed themselves on the ethical and moral problems posed by the warmakers' strategies and the weapons

systems [12]. They too often remain confined in the role of technical advisers to which they are assigned by the authorities, even if this role is essential. Treatment of war victims or attackers, whether they are civilians or military personnel, makes in effect an appeal to medical competencies in very diverse fields and specialties. These competencies will be crucial in cases of technological or industrial accidents, accidents that constitute a permanent threat for the future of our societies. We must not forget the disastrous cost of the catastrophe in Chernobyl, and also not forget that the gas leak in Bhopal caused more deaths than the September 11, 2001, attacks in the USA.

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