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Regulating Conventional Weapons in the Future — Humanitarian Law or Arms Control?*

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Weapon regulations are difficult to achieve, but when they exist they seem to be respected in the practice of States. The prohibitions against the use of expanding bullets and biological weapons have always been effective. So has the prohibition against the use of chemical weapons, until the fourth year of the Iran–Iraq conflict. The customary rules on recording of emplaced land-mines for postwar publication functioned during the Falklands conflict. All in all, international humanitarian law in this field has demonstrated a potential that should be used in the future. The article analyzes the historical evolution of the concept of ‘superfluous injury or unnecessary suffering’ and suggests some areas where new restrictions or prohibitions should be striven for. The article throughout indicates the existence of a fruitful relationship between international humanitarian law and disarmament. The author feels that this relationship should be explored more vigorously in the future.

1. Introduction

An obvious approach in weapon negotiations is to try to remove certain weapons completely from the arsenals, or to reduce the quantity of specific weapons, or to stop or slow down new dangerous developments in the qualitative arms race. This disarmament or force reduction approach has not, however, led to any binding multilateral treaties. There is no treaty banning the *production* of a specific category of conventional weapons; nor is there today any treaty on quantitative restrictions on *deployment* of conventional weapons.¹

In the quest for a safer and more decent world, there is also another approach to weapon negotiations; to lay down rules of a humanitarian nature restricting or prohibiting the *use* of specific weapons. The efforts to outlaw the use of excessively inhumane means and methods of warfare started and were inspired in the late 19th century by the work of Henry Dunant. This humanitarian approach has been noticeably more successful, taking into account that a number of regulations are in force and that they more often than not work in practice. The present article will therefore focus on the potential of international humanitarian law applicable

in armed conflict, but in doing so it will note the connection between humanitarian law and arms control/arms limitation. The purpose is in one case humanitarian and related to individuals, in the other security oriented and related to States. But the point is, that humanitarian agreements can also generate confidence between states and thus have a bearing on international security. The concept of arms control should then not exclusively relate to disarmament efforts. Conceptually, the term ‘arms control’ includes humanitarian regulations on specific weapons, as well as regulations expressing a mix of humanitarian and security concerns. Such regulations could well be labelled ‘humanitarian arms control’ when the humanitarian element is dominant or significant. Of course, the value of these terminological remarks is only evident if the thinking behind them is transferred to, and mirrored by, practical politics.

2. Conventional Weapons and International Law in Historical Perspective

In 1868 the St. Petersburg Declaration was adopted, a text which laid down a standard valid for all subsequent negotiations on rules for armed conflicts. The St Petersburg conference was assembled by Czar Alexander II. At the conference seventeen nations adopted a Declaration which was seen as a

* The views expressed in this article are personal and do not necessarily reflect the views of the Swedish Government.

first step in a work 'to conciliate the necessities of war with the laws of humanity'. The Declaration stated:

That the only legitimate object which States should endeavour to accomplish during war is to weaken the military forces of the enemy:

That for this purpose it is sufficient to disable the greatest possible number of men;

That this object would be exceeded by the employment of arms which uselessly aggravate the sufferings of disabled men, or render their death inevitable;

That the employment of such arms would, therefore, be contrary to the laws of humanity.

These principles were given explicit form in a prohibition on the use of high explosive bullets weighing less than 400 grams. Originally constructed to detonate enemy ammunition wagons, these bullets were later modified so that they exploded on contact with a soft substance. As a consequence, they were apt to injure human beings far more than earlier generations of projectiles had done. The Russian Government, unwilling to allow another country to take advantage of the bullet, was instrumental in achieving this legally binding agreement on *use*. Later, *production* of the projectiles in question ceased. A certain disarmament or arms limitation effect had been achieved *de facto*, albeit not *de jure*.

The *de facto* relationship between humanitarian law and arms limitation was not coincidental. Any *total prohibition* on use could lead to weapons being eliminated from the arsenals. Mere *restrictions* on the use of certain weapons, however, would probably not lead to such results. St. Petersburg had indicated the link between efforts for qualitative disarmament on the one hand and negotiations in the spirit of Henry Dunant on the other, and history was to add further evidence of this relationship.

In the 1890s Czar Nicholas II of Russia initiated the convening of a peace conference to consider 'a possible reduction of the excessive armaments which weigh upon all nations'. The proposal was not the Czar's own idea. It originated in his War Ministry. Russia was lagging behind in the arms race and could not afford to catch up. Barbara Tuchman relates in her book *The Proud*

Tower (1966) that Austria, Russia's chief rival, was planning to adopt the improved rapid-fire field gun which fired six rounds a minute and was already possessed by Germany and France. The Russians, whose field guns fired one round a minute, could not afford to rearm their entire artillery. If the Austrians could be persuaded to agree to a ten-year moratorium on new guns, both countries would be spared the expense. Later, humanitarian arguments were added and the final proposal contained an international, rather than a bilateral, moratorium on new weapons.

The Peace Conference met in the Hague in the summer of 1899. It is often said that it failed to reach agreement on the primary object for which it was called, namely the limitation or reduction of armaments. It is true that the conference did not agree on any quantitative disarmament measures, but it adopted a number of humanitarian texts, one of which amounted to a qualitative armaments regulation: the Declaration outlawing the use of the so-called dum-dum bullets. These expanding bullets were used by the British against fanatical tribesmen in India, and the US Government planned to make use of them in the Philippines. As they flattened easily on impact with the human body they were generally considered to be excessively injurious and, following the spirit of St. Petersburg, the delegates voted 22 to 2 to prohibit their use. Since then, as far as we know, this type of projectile has not been deployed in international conflicts, nor has it been produced or stockpiled for possible use by regular forces.

The 1899 Peace Conference also adopted a Convention with respect to the laws and customs of war on land, in the annex of which it was stated that the right of belligerents to adopt means of injuring the enemy was not unlimited and that the employment of poison or 'arms, projectiles, or material of a nature to cause superfluous injury' was prohibited.²

At the Second Hague Peace Conference, held in 1907, these provisions were all transferred and confirmed within the framework of the new Convention respecting the laws and customs of war on land. The wording was more or less the same, although there

was an interesting change of style in the English text. While the 1899 rules had referred to weapons causing 'superfluous injury', the 1907 rules referred to weapons causing 'unnecessary suffering'.³ The idea was of course the same: to confirm the standard of St. Petersburg and to reaffirm the principle that in the employment of weapons humanitarian considerations and military necessity shall be balanced.

The next treaty to prohibit the use of specific weapons was the Geneva Protocol of 1925. Although the Protocol concerns non-conventional (BC) weapons, its regime of reservations differentiating between first and second use is relevant to all humanitarian weapon prohibitions.

Although second use is still permissible, as reprisals in kind under customary international law, a prohibition of first use is always meaningful. At the same time the weakness of these humanitarian rules is evident: the danger that weapons that exist but are prohibited for use, may, under certain circumstances, be used after all. Hence the need for 'follow-up conventions' prohibiting the development, production and stockpiling of the weapons in question.

Since 1925 there has been no comprehensive prohibition of use of any existing weapon category. In 1977 The First Additional Protocol to the Geneva Conventions of 1949 only repeated what was by now a principle of customary law, namely that

It is prohibited to employ weapons, projectiles and material and methods of warfare of a nature to cause superfluous injury or unnecessary suffering.

But this general formula is not very helpful. It is usually considered that a specific weapon is not governed by this rule unless there already exists an explicit prohibition of the weapon concerned, i.e. there has to be an agreement between states where humanitarian imperatives are given precedence over military considerations.

3. *The UN Conventional Weapons*

Convention and the Need for a Follow Up

A small step forward in international law was taken when, in 1980, the UN Conference

on Prohibitions or Restrictions of Use of 'Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects' concluded its work. The Conference adopted an 'umbrella treaty', under which three Protocols on specific weapon categories were subsumed. This treaty complex was opened for signature in New York in 1981. From the point of view of disarmament or arms limitation the texts are of limited interest, since the only *total prohibition* of use adopted concerns a weapon category which does not exist and is not militarily useful enough to develop. This is said with reference to the annexed Protocol I on weapons whose primary effect is to 'injure by fragments which in the human body escape detection by x-rays'. The remaining two Protocols only lay down *restrictions* on the use of certain weapons, Protocol II on the use of land-mines and booby-traps and Protocol III on the use of napalm and other incendiary weapons. At the UN Conference a number of non-aligned and neutral states advocated a comprehensive ban on all use of incendiary weapons, since incendiaries as such were considered to be excessively injurious.⁴ Many states will certainly revert to this question at a later juncture.

The modest result of the Conventional Weapons Conference points to the need of a review conference. A review is also envisaged in the umbrella treaty of 1981. According to article 8 of the treaty a review conference will be summoned after 20 ratifications or accessions if 18 parties so request or, if the number of ratifications or accessions is over 35, if a majority of the parties so request. The Convention and the three annexed Protocols have as of July 1986 been ratified or acceded to by 25 states.

A review conference would, in addition to incendiaries, probably also consider restrictions on small-calibre weapons systems. In the late 1960s American surgeons had noted that the M16 assault rifle, then recently introduced in Vietnam, created extremely large exit wounds. Initially the high velocity was blamed, later the energy transfer. The latter explanation is now proved to be the correct one. In 1979, at the first session of the

UN Conference, a resolution was adopted appealing to all governments to exercise the utmost care in the development of small-calibre weapons systems, so as to avoid an unnecessary escalation of the injurious effects of such systems. In this context, reference was made to the 1899 Hague Declaration on dum-dum bullets. The Resolution of 1979, although not legally binding, seems to have influenced the development of new weapons and ammunitions in a positive way.⁵ Against this background a review conference will not necessarily discuss legally binding rules on small calibre weapons systems. A new resolution repeating the earlier Appeal might prove sufficient.

Protocol II of 1981 (on land mines and booby-traps) contains rules on recording of minefields and information after hostilities which may have the status of customary law. These rules functioned during and after the Falklands war, although the Parties to the conflict had not acceded to the Protocol. Protocol II, however, is insufficient in the sense that it does not effectively deal with the question of 'material remnants of war' (MRW). Article 9 of the Protocol provides that after the cessation of active hostilities States shall endeavour to agree among themselves and with international organizations on assistance to remove or render ineffective mines and booby traps placed in position during the conflict. This provision alone will not remedy the growing problem of explosives left behind after a conflict. In many parts of the world mines and other explosive material lie around the countryside for decades after the cessation of hostilities and are a constant danger to the population and an obstacle to many economic activities. The matter should be addressed by a future review conference.

The question of sea-mines and remnants of war at sea was not regulated at all in 1981. The relevant rules in this context date from 1907 (the VIIIth Hague Convention) and could usefully be updated and modernized.

Another weapon, which certain delegations considered as excessively inhumane during the UN Conference and which might be taken up at a future review conference, is fuel-air explosives (FAE). This weapon

category, and others, will now be discussed under separate headings.

4. FAE — '*the Conventional Mini-Nuke*'

A fuel-air explosive is a bomb which relies for its effect on shock waves caused by the detonation of a fuel cloud created in the air. It is a relatively new concept in weapons technology. The weapon consists of a container with a volatile and inflammable liquid or powder, attached to which is a device constructed to disrupt the container and spray the contents into the air. After a short delay, the fuel has had the time to mix thoroughly with the air. When the right proportions of fuel-to-air are reached the aerosol cloud is detonated by means of one or several detonators present within the cloud. The result is a powerful blast.

A 35 kg FAE charge will produce overpressures of 2–3 Megapascals within a diameter of 15 m. The blast level is 2–3 times that required to kill 99% of the human beings in the area.

A fuel-air explosive differs from an ordinary high explosive charge mainly because the energy content per kg of warhead is much higher, since the oxidant is not present in the charge (the oxygen in the air is used), and because the container is lighter than is customary for high explosive bombs.

FAE munitions can be delivered by several means, e.g. attack aircraft, helicopters and ground- or sea-based rocket launchers. The present generation of FAE weapons has to be launched from rather slow aircraft. The FAE bomb must be retarded by a parachute or another device before the charge ejects its fuel content into the air. For the emerging second generation FAE munitions it is expected that they can also be launched from fast aircraft at low altitude.

A third generation of FAE weapons is already being developed. A 553 kg FAE charge of the new kind would blast an area exceeding 400 m in diameter, and a 1000 kg charge would cover an area with a diameter of 490 m at a pressure which is sufficient to destroy grounded aircraft and other materiel.

The FAE weapons seem to have been constructed mainly for one purpose: the

clearance of minefields. In the 1970s an FAE shockwave effectively detonated pressure-sensitive mines and booby-traps and cleared an area for advancing troops or for use as a helicopter landing strip. This type of anti-materiel area bombardment is not in conflict with the laws of war. However, during the 1980s many mines have been made resistant to the momentary, instantaneous shockwave of a FAE-detonation. Most modern mines need a more lasting, enduring pressure in order to explode.

As a consequence, the possibility of *anti-personnel* use of FAEs has received a certain topicality. Already in 1974 a representative of the US Navy said: 'This weapon is designed to be an effective blast weapon against protected or concealed troops, land mines, booby-traps and light materiel targets'.⁶

An anti-personnel use could be very tempting from a military point of view: (1) A blast wave with an overpressure of 1 Megapascal and 10 milliseconds duration will cause about 99% mortality of unprotected persons within the cloud. (2) The FAE aerosol cloud spreads through vegetation and follows the contours of the ground into foxholes and trenches where otherwise troops would be sheltered from fragmentation weapons. (3) Due to its well-defined area of effects the weapon is suitable for combat use close to the user's own troops (close air support).

Death from blast injuries is probably one of the most terrible ways of dying, possibly even worse than death from burns. The lungs are usually the most injured organ. Injury is mainly caused by the blast wave passing through the respiratory passages. Death from severe lung injury is an appallingly painful and agonizing process, taking any time up to half an hour. A person caught by the shock wave will probably be suffocated by his own blood coming from the ruptured lungs. In some cases, however, death will be instantaneous due to air embolism.

During the Vietnam war, FAE was used to clear presumed mine fields. But towards the end of the war, when the North Vietnamese Army was closing in on Saigon, alarming reports came through the world

press about soldiers found dead in the battlefield without any visible external injuries, lying with their mouths open and their hands to their throats. Available facts pointed to the conclusion that the soldiers had been hit by FAEs, used by the desperate South Vietnamese forces, and that they had suffocated due to lung bleeding.

Anti-personnel use of FAE weapons could be said to violate the St. Petersburg principle that states shall abstain from 'the employment of arms which uselessly aggravate the sufferings of disabled men, or render their death inevitable'. On the other hand, it has been argued that a soldier on the battlefield would not be better off being attacked with conventional high explosives, which of course are permitted under the laws of warfare. The pressure effects would, according to this view, basically be the same, although the blast area in each case of an artillery detonation probably would be smaller.

When the case of FAE was discussed in 1978 during the Preparatory UN Conference on Conventional Weapons at Geneva, it was not in connection with a comprehensive prohibition against *all* use, but in consideration of a proposal restricting the permissible use of FAE to situations where 'the aim is exclusively to destroy material objects, such as the clearance of mine fields'. Even so, these ideas were highly controversial. A US delegate pointed out that 'blast had been a primary wounding mechanism since the discovery of explosives'; and that 'blast overpressures far exceeding those produced by current FAEs result from the detonation of well known conventional high explosive weapons'. This delegate also argued that 'while it has been claimed by others that death from blast effects is particularly agonizing and painful, it is well known that in the lethal area, the mechanism of death is very rapid specifically, air bubbles entering the blood stream produce rapid effects on the brain and heart'.⁷ This quotation is sufficient to show that the humanitarian case against FAE may be problematical. And even if it was not and an anti-personnel prohibition was achieved, that would not 'do the trick', since FAE deployed for anti-materiel use

could be used in desperate situations against people. The risk of anti-personnel use can only be eliminated by a total prohibition. Such a prohibition, however, can only *partially* be motivated by reasons of humanitarian law. It has fundamentally to be based on reasons of arms control in a wider sense. Probably it should be seen as a force reduction measure with valuable humanitarian spin-off effects.

Like the neutron bomb, FAE is a battlefield weapon, which can be linked to the doctrine of flexible response. Like the neutron bomb, it may be argued that its relatively well-defined area of effect assures an ability to minimize collateral damage. Unlike the neutron bomb, it has no potential for killing people in tanks, but, on the other hand, FAE is more effective against fortified troops than chemical weapons. In the area of effect the blast pressures are directly comparable with nuclear weapons. The US Marine Corps has been reported as developing a 'Mass Air Delivery' FAE system with two dispensers, each of which contains twelve 62 kg FAE warheads. This system could cover an area of several hectares in a single attack.⁸ The next step in a 'flexible escalation' may well be the employment of 'mini-nukes'.

There are reasons to believe that an extensive use of FAE on the battlefield could complicate the task of limiting a war to the use of conventional weapons. Thus, a comprehensive FAE ban could be a useful contribution to efforts aimed at raising the nuclear threshold.

A prohibition would not only be directed towards the United States. It is true that the US has been the main developer and user of FAE (the first successful test was made by the US Navy in 1960), but there is no technical reason why the Soviet Union should be behind in development and production. The Soviet Union was testing FAE devices in 1973 and may well have a large and sophisticated arsenal today.⁹ Reports from Afghanistan indicate that Soviet forces have been using FAE-bombs in the eastern provinces.¹⁰

There have also been signs of proliferation. During the conflict in Lebanon, in the

summer of 1982, there were unsubstantiated rumours that the Israeli attack on the Palestinian fortress of Beaufort had been successful due to the anti-personnel use of FAE.

To sum up: The case against FAE is not so much based on humanitarian law (FAE seems not to produce any inhumane effects other than those which normally occur on the battlefield) as it is related to arms control objectives in a wider sense. The fuel-air charge is a unique blast weapon in the sense that it, for its effect, relies *exclusively* on the blast as such. Other blast weapons, such as artillery shells, hand grenades, certain anti-personnel mines and aircraft bombs, rely on additional fragmentation effects which sometimes constitute the main source of injuries. As an 'exclusive blast weapon' FAE stands for a new dimension of injuries as well as a new dimension of escalation risk. That is why, from a 'humanitarian arms control' and disarmament perspective, a total prohibition of FAE would be especially meaningful. Such a prohibition could, in the humanitarian tradition, be expressed as a rule against use; or, somewhat more ambitiously it could be put into a disarmament context as a ban on development, production and stockpiling.

5. *Battlefield Laser Weapons Specifically Designed for Anti-Personnel Use*

Laser weapons are not only a matter of space warfare and strategic defence protection. Lately there has been some concern that military laser technology could be used for anti-personnel purposes on the battlefield in a way contrary to the standards of humanitarian law. Today, laser beams are used widely for civil and military purposes. The health services, industry and shipping are examples of civil areas in which laser is used as a matter of routine. In the military context, laser is used *inter alia* for range finding, target designation, and in different simulators for peacetime exercises.

One of the main problems with the use of laser beams is the danger that they constitute for the human eye. Laser exposure, even for fractions of a second, may cause total

blindness. Since the beam can be continuous the probability of soldiers being blinded is very high.¹¹

Already the military equipment of today (range finders and the like) can be used in an anti-personnel manner, should the people in charge of the equipment so wish. Nor can unintentional anti-personnel effects be excluded, but this should not be a matter for regulation in any future legal instrument on lasers. International humanitarian law already contains principles according to which civilian population and individual civilians should be protected from deliberate and indiscriminate attacks, as well as from harm which could have been avoided through precautionary measures (cf. article 57 in Additional Protocol I of 1977). Similar requirements of precaution for the benefit of soldiers do not seem to be possible in time of war.

The laser equipment that will be on the production line in the immediate future will include *anti-materiel* weapons, which as such should not violate international standards, even if they may have secondary anti-personnel effects. This kind of anti-materiel lasers would be designed to destroy inter alia sighting equipment and optical sensors on tanks, and to shoot down (or rather 'beam down') helicopters and aircraft. The problem is of course that such anti-materiel laser weapons also could be used for anti-personnel purposes.

It is obvious, moreover, that it is already possible today to develop, manufacture and supply armed forces with specific *anti-personnel* laser weapons.

Lasers can be used against the human eye in close-up engagements or by letting laser beams sweep across a zone of military operations. When the eye is struck by the laser beam, the optical system of the eye concentrates the light's energy up to 100,000 times. This results in permanent damage to the retina and causes haemorrhages in the vitreous body. The consequence may be permanent blindness.

Gradually, as more powerful laser systems are developed, systems which can burn soldiers to death may emerge. No laser weapon of this anti-personnel type seems so far to

have been fully developed and incorporated in the arsenals of armed forces.

There are several factors that seem to stimulate a development of laser weapons. They do not require the ammunition logistics systems associated with ordinary weapon systems. The extremely fast laser beam (speed of light) means that the problems of trajectory and lead are eliminated and that targets may be attacked at greater ranges. Thus, for tactical engagements, laser is a zero time-of-flight weapon, with a straight beam powered by a generator or a battery.

Since the beam can be continuous or repeated with high frequency, and since several beams may sweep against the same area, the probability of the adversary's soldiers being blinded could be made sufficiently great. This probability is further enhanced by the fact that it is possible to damage a human eye from a narrow angle, i.e. it is not necessary for the victim to look straight into the laser beam that is hitting him. This is due to the fact that the total horizontal visual field of man is 190° and with sufficient energy, a vitreous bleeding can be precipitated from any part of the fundus. With less energy, retinal lesions in or outside the centre of clear vision (fovea) cause permanent visual loss if given in a sector of about 30°. The only limiting factor is the pupil diameter.

The use of anti-personnel lasers, the main effect of which would be to blind the adversary's soldiers for the rest of their lives, is, in the view of this author, a prohibited method of warfare under existing international law.

The reasons for this would be the following: Using weapons or equipment for anti-personnel purposes that cause permanent blindness is not in proportion to the legitimate object of warfare. The basic Declaration of St. Petersburg of 1868 only permits putting the adversary's soldiers 'out of action', by which basically is meant out of action *on the battlefield*. Although it is permitted to kill combatants under the laws of war, and thus to put them permanently out of action, it is not permitted to use methods or means of warfare *exclusively designed* to injure soldiers with the injurious effects lasting, not only for the duration of the conflict,

but for the rest of their lives. In the balance between military interests and humanitarian considerations, a life-long disablement such as blindness must be described as 'unnecessary suffering' according to the formulas of St. Petersburg, the Hague and (since 1977) Geneva.

Bearing in mind laser's many areas of use, both military and civil, a total ban on all use of laser weapons would be unrealistic. However, there are strong reasons for seeking to establish a ban in the area of anti-personnel use. Every intentional anti-personnel use of directed energy could be the object of a prohibition. In fact, a prohibition against use with the deliberate and serious effects described above would only reiterate what is already existing law.

A less ambitious approach would be a document that avoids explicit references to laser, but reaffirms traditional principles of international humanitarian law and relates these principles to modern technologies. It would then be stated that in the use of such technologies special care should be taken not to violate the international legal standards.

Leaving the ordinary 'use approach' of international humanitarian law and entering the domain of arms limitation, states will find the task more complicated. States would then have to consider a prohibition of the development and production of laser weapons, the primary purpose of which is to blind the adversary's soldiers or otherwise to injure the human body (a purpose criterion). A prohibition along these lines could in addition be linked to certain technical parameters indicating a design apt to cause serious eye injury and blindness (a technical criterion).

Under ideal circumstances any development/production rule should relate to special technical characteristics of anti-personnel laser, but a solution along these lines is probably impossible to negotiate, since it can be argued (1) that such a rule cannot be verified, (2) that the legitimate development of laser equipment should not be hampered by rigid technical restrictions, and (3) that it is impossible to single out technical characteristics *exclusively* indicating an anti-personnel area of use. The con-

clusion may be either that a prohibition of development and production should be avoided, or that it has to be combined with restrictions in use. Prohibitions or restrictions in use will be more or less self-verifiable.

A prohibition of *production* of certain lasers would have a humanitarian rationale although it would be expressed in the form of an arms limitation measure. Such a prohibition would be a clear example of 'humanitarian arms control'.

Supposing that production of anti-personnel laser weapons were to be prohibited, additional restrictions in *use* would address themselves exclusively to anti-materiel laser weapons or other laser equipment which could be misused in an anti-personnel way.

Here, again, there is a problem of verification, however. Within a zone of military operations it will probably not always be possible to distinguish between intentional and unintentional anti-personnel use of laser. Laser used for range finding can unintentionally hit soldiers and cause eye injury. Although there may be difficulties of a practical and legal/technical nature with many of the approaches suggested above, this should not discourage negotiators. One should keep in mind, that the normative value of an explicit rule in this field of arms control law would be immense. Any document explicitly excluding the deliberate anti-personnel use of laser would soon be recognized as a moral and humanitarian necessity in the tradition of the 1899 ban on dum-dum bullets and the 1925 Geneva Protocol on chemical and biological weapons.

6. *A New Instrument on Sea-Mines?*

In September 1985 the United Nations Study on the Naval Arms Race (UN Document A/40/535) presented some suggestions on possible measures of disarmament and confidence building at sea.¹² Among these was 'modernization of the laws of sea warfare'. It was noted that most of the treaty law which regulates naval warfare is very old, the most obvious example being the Hague Conventions of 1907 which today are partly obsolete.¹³ A complete revision and updating of the relevant conventions and other

older instruments would probably not be a realistic undertaking. However, it should be possible to single out certain issues of particular interest and consider the adoption of separate brief protocols on them. Any agreement of this kind, which is adhered to by the major military powers, would have considerable confidence-building effects.

At the 25th International Red Cross Conference in October 1986 at Geneva, a resolution with a bearing on these matters was adopted.¹⁴ The resolution noted the contribution of the United Nations in the field of sea warfare and stressed 'relevant parts of the reports of the United Nations on the subject'. The resolution also appealed to Governments to coordinate their efforts 'in appropriate fora in order to review the possibilities' of modernizing parts of the international humanitarian law relating to sea warfare, if this was considered necessary. One of the topics that was suggested for further consideration in the UN study was a new instrument on sea mines.

The 1907 Hague Convention Relative to the Laying of Automatic Submarine Contact Mines is of some, albeit limited, value today. An updating of the 1907 rules should cover more than contact mines and confirm principles which could be seen as expressing customary law today. Thereby the protection of peaceful, including neutral, shipping would be increased.

The Hague Convention makes a distinction between anchored and unanchored contact mines. The latter could only be laid when they are so constructed 'as to become harmless one hour at most after the person who laid them ceases to control them' (art. 1:1). Anchored mines should 'become harmless as soon as they have broken loose from their moorings' (art. 1:2). Moreover it is forbidden to lay anchored mines off the coast or ports of the enemy 'with the sole object of intercepting commercial shipping' (art. 2).

It can be argued that the inadequacy of the Hague Convention mainly lies in what is not included in it. It does not relate to later developments, i.e. to modern mines which rely on magnetic, acoustic or pressure effects or a combination thereof. It does not distinguish between mine laying in territorial

waters and mine laying in the High Seas. However, it is not a foregone conclusion that a new treaty in this field should specifically relate to these problems. Rather, and from the point of view of practical politics it could be argued that a more general approach is called for. The VIIIth Hague Convention is based on the requirements of neutralizing mechanisms and information. Article 1 requires that States shall *construct* their contact mines in the way described above. Article 3 states that, in case anchored mines cease to be under surveillance, the belligerents undertake to *notify* the danger zones as soon as military exigencies permit this for the security of peaceful shipping. A new treaty could usefully and in a general way build on the same concepts (neutralizing mechanisms and information) in order to protect peaceful uses of the marine environment.

Advances in electronics have made it possible to develop mobile mines laid at great depths. They will be activated by passing ships and, with the help of various types of sensors, guided towards their target. The mine will virtually transform itself into a torpedo.

The combined use in modern mines of different triggering systems — one example being the ship counter, which initiates the mine only when a given number of ships have sailed past (including, presumably, the mine-sweepers) — has made the modern mine very difficult to combat.

If these modern mines, when used in a future conflict, are not fitted with neutralizing mechanisms, or if the parties to the conflict have not recorded the location of the mines, the problems of 'material remnants of war' (MRW) will be impossible to solve for many years after the cessation of hostilities. As a consequence the lives of fishermen and seamen will be put into danger, and oil tankers will present an indirect threat to the natural environment.

Consequently, the following two suggestions, as to the content of a future instrument on Sea Mines, present themselves:

— In order to reduce the prevalence of active naval mines that are left behind after a future war, it should be compulsory for

every mine to be fitted with a device that automatically deactivates it, or with a signal that does, when the mine is no longer of military use.

— In order to increase the feasibility of clearing minefields at sea, specific international rules governing the keeping of records should be introduced. To facilitate clearance it is essential that these records should not only specify the position of the minefields but should also contain particulars of a technical nature relating, for instance, to the type of mines that have been implaced.

A new instrument should not restrict the development of mines that will be able to lay dormant on the seabed for months, perhaps even years, before being activated by an acoustic signal. According to current plans such mines would be equipped with discriminatory sensors that will lead them to specific military targets only. A library of acoustic signatures of different ships linked to a trigger mechanism represents an extremely promising approach to the problem of anti-submarine warfare (ASW). Such dormant and 'smart' anti-submarine torpedo mines will not come into conflict with the principles of the 1907 Hague Convention, which was aimed at limiting the inherent problems with the typical non-discriminatory mines threatening innocent ships. Nor should there necessarily be a duty of notification with regard to dormant mines on the seabed which are reliably harmless.

A new regulation on sea mines could, as has been suggested in the UN Study on the Naval Arms Race, be elaborated as a brief, separate, independent instrument. It could also be a Protocol within the framework of the 1981 UN Convention on Conventional weapons. It is not, however, suggested by this author that States should consider an additional protocol to the Hague Conventions, which due to their age, scope and complexity raise so many problems that they should preferably be left alone.

7. *Concluding Remarks*

In June 1986 the Warsaw Treaty Member States had a meeting in Budapest where they issued an appeal to NATO concerning inter alia 'the mutual and significant reduction of

armed forces and conventional armaments in Europe'. The proposals in question could, it was stated, be the subject of concrete discussion in the second stage of the Conference on Confidence- and Security-Building Measures and Disarmament in Europe (CDE).

On December 11, 1986, the NATO Council, meeting in Brussels, issued a Declaration on Conventional Arms Control. The NATO members declared themselves ready 'to open East/West discussions with a view to the establishment of a new mandate for negotiating on conventional arms control covering the whole of Europe from the Atlantic to the Urals'.

Due to the Budapest Appeal and the Brussels Declaration, the matter of conventional disarmament has attained a certain topicality. This may be further underlined if the Mutual (Balanced) Force Reduction Talks (MBFR) eventually will become amalgamated in the CDE II process in Vienna. Both the Warsaw Pact countries and NATO have announced proposals on conventional disarmament in Vienna. Against this background it could be argued that conventional disarmament and force reduction measures *per se* have not been given enough attention in this article.

The justification for putting an emphasis on *specific* humanitarian law/arms control measures, and leaving a broader discussion on conventional disarmament aside, could be summed up as follows:

- (1) In the present world situation specific arms control measures may be easier to achieve than more comprehensive arms or force reductions;
- (2) Also, more limited and less ambitious weapon related agreements have a clear potential for building confidence between states; and
- (3) consequently any such agreements may create a momentum for further, more far-reaching regulations.

One advantage with prohibitions of use of specific weapons is that they tend to be self-verifiable. A military significant use of chemical weapons, incendiary weapons or blinding lasers cannot be concealed. The

obvious disadvantage, however, is that the contracting parties can never know for sure that the weapon in question will not in fact *be used* in combat. Only a verifiable prohibition on production and stockpiling will give that reassurance. Thus humanitarian regulations can never replace disarmament treaties, but they can serve as a confidence building starting point — when the political climate does not allow for more. Thus, in trying to get ‘the ball rolling’ one should not exclude that the approach of international humanitarian law could be useful also in the context of international security. At the same time humanitarian gains should be striven for in all possible fora, be they review conferences on the laws of warfare or disarmament negotiations.

The question mark in the title of this article (‘humanitarian law or arms control?’) was thus more a pedagogical tool for opening a discussion than anything else. In fact, the two concepts overlap and cannot be mutually exclusive. Moreover, one legal approach should not exclude the other.

NOTES

1. It should be noted, however, that the Peace Treaties after World War II with Austria, Bulgaria, Hungary, Finland, Italy, and Rumania contain clauses prohibiting these states to possess various weapons, conventional as well as of the mass destruction type. The Austrian State Treaty of 1955 *inter alia* provides that Austria shall not possess ‘any self-propelled or guided missile or torpedoes’, nor any ‘guns with a range of more than 30 kilometers’. The history of disarmament also knows of serious efforts to curb the conventional arms race as such, but these efforts basically belong to the League of Nations period. See Rosas (1981).
2. Article 23(a) and (e) in the Annex of 1899. See Schindler & Toman (1981), pp. 76–77.
3. Article 23(e) in the Annex of 1907. *Ibid.*
4. The 1981 Protocol on Incendiary Weapons basically only protects the civilian population from the effects of incendiary weapons (including napalm), and in the main leaves the combatants to their fate. Article 2:2 of the Protocol only provides that it is prohibited to attack military objectives with air-delivered incendiary weapons if these objectives are ‘located within a concentration of civilians’.
5. de Veth (1982) from Fabrique Nationale in Belgium describes the development of the new NATO small calibre system. See also Janzon (1986).

6. Statement by Admiral Gaddis in the US Senate Committee on Appropriations in 1974, cf. Lumsden (1978), p. 173.
7. Colonel Llewellyn in a statement on September 14, 1978, at the Preparatory UN Conference on Prohibitions or Restrictions of Use of Certain Conventional Weapons, Geneva.
8. This FAE system for ‘Mass Air Delivery’ has been known as MAD FAE (MAD otherwise being the acronym for ‘Mutual Assured Destruction’ in the nuclear context), cf. Lumsden (1978), p. 173.
9. Cf. Johannsohn (1976), pp. 992 ff.
10. See *Jane's Defence Weekly*, 26 May 1984, p. 819.
11. The military and medical facts of this part of the paper are based on Anderberg, Sjölund & Tengroth, ‘Battlefield Laser Weapons and the Question of Anti-Personnel Use’, unpublished paper presented to the Swedish Humanitarian Law Delegation in 1986.
12. Study on the Naval Arms Race, Report of the Secretary General, 17 September 1985. This author presented a memo on ‘Modernization of the laws of sea warfare’ to the UN Expert Group (through the Swedish expert of the group), which explains the similarities in wording in this article and the UN Study.
13. Of the 13 Hague Conventions of 1907 six relate to naval warfare. The 6th Convention deals with the treatment of enemy merchant ships at the outbreak of hostilities, the 7th with the conversion of merchant ships into warships, the 8th with automatic contact mines, the 9th with bombardment of targets on land by naval forces, the 11th with the right of capture in naval war and the 13th with the rights and duties of neutral states.
14. Resolution adopted by consensus under the heading ‘Further Work Relating to the International Humanitarian Law of Sea Warfare and Land Warfare’.

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