

## TRENDS IN FRAGMENTATION WEAPONS

by Eric Prokosch

*In its issue of July 1975, the International Review reprinted the substance of a circular letter sent to all governments inviting them to participate in the second session of the Conference of Government Experts on the Use of Certain Conventional Weapons at Lugano, 28 January to 26 February 1976.*

*The letter gave the programme of the Conference, which will deal with incendiary weapons, small-calibre projectiles, delayed-action and treacherous weapons, blast and fragmentation weapons and other new weapons, continuing the work on conventional weapons which might cause unnecessary suffering or have indiscriminate effects.*

*This Conference, together with the Diplomatic Conference on International Humanitarian Law, should give concrete form to various general principles contained in the draft Protocols under examination by the Diplomatic Conference concerning methods and means of combat. It should in particular give better definition to the general principle that the parties to an armed conflict do not have an unlimited right in the choice of the methods and means of warfare and specify the weapons whose use must be renounced by the parties because of the unnecessary suffering they cause and because of their indiscriminate effects.*

*As we approach the second session of the Conference of Government Experts, it is a pleasure to publish an article by a scientist who took part in the first session in 1974 as an observer for a non-governmental organization, The Friends' World Committee. The author, Mr. Eric Prokosch, has a doctorate in anthropology from the University of Stanford and has taught this subject at the University of Wisconsin. He is currently writing a book on the development of various "antipersonnel" weapons. In the*

*following article, Mr. Prokosch discusses one of the categories to be considered by the experts at Lugano, fragmentation weapons. He takes up the present trends in the development of such weapons and the reasons for hope that agreement will be reached on the banning or limitation of the use of the most inhumane weapons in this category. (Ed).*

The appearance of certain "inhumane" weapons in recent warfare has prompted an examination of their use, in connection with the discussions of the extension of humanitarian law into armed conflicts. There are proposals to ban the use of incendiaries and certain small-caliber projectiles, fragmentation weapons, and aerially emplaced anti-personnel land mines. The government experts' conference, held in Lucerne under ICRC auspices September 24-October 18, 1974, discussed these and certain blast weapons, delayed-action and "treacherous" weapons, and possible future weapons without, however, reaching a consensus on any bans. A second government experts' conference will be held under ICRC auspices January 28-February 26, 1976 in Lugano.

My own research on fragmentation weapons, which is based on official documents and conversations with ordnance specialists in a number of countries, has shown several alarming trends. Fragmentation weapons eject numbers of small fragments (usually of metal) which are meant to inflict damage on military "targets" (military personnel and vehicles, etc.) by penetration into them. One trend since World War II has been in the direction of more numerous and smaller fragments ejected from a given munition. The common World War II hand grenade, for example, had a cast iron case which broke upon explosion into a few large fragments and much harmless "dust." In its place today, there are various modern grenades that break into hundreds of small fragments giving a high probability of injuring anyone nearby.

Several techniques are used to obtain many small fragments. A munition casing, if internally grooved in the proper pattern or consisting of a coil of properly notched wire, will break along the grooves or notches. These techniques are used in hand grenades, in "bomblets" (small bombs), and in a mortar shell currently under development. Little metal balls or cubes, if packed around an explosive, will be ejected on explosion; a technique used in hand grenades and bomblets. Ductile iron

and pearlitic malleable iron have been used for optimum fragmentation in mortar shells developed in several countries in the 1950's and 1960's. High fragmentation alloy steels are used in mortar and artillery shells and in bomblets; munitions currently in production or development in several countries.

A small fragment will, in general, cause less damage to the body than a large fragment moving at the same velocity; thus, it can be argued that modern munitions ejecting small fragments are more humane than old-fashioned ones. On the other hand, if there are more fragments, there is a greater risk of multiple wounding (a person being hit by several fragments), and more people are likely to be hit. Thus, the total suffering inflicted by a modern high-fragmentation munition, in so far as such things can be quantified, is arguably greater than that inflicted by an old-fashioned munition of comparable dimensions.

A second trend in fragmentation weapons is the appearance of novel forms of fragments, notably the flechette, a nail-like object with fins at the blunt end. Thousands of flechettes are contained in canister or shrapnel-type artillery and rocket munitions, a number of which have been used in recent conflicts. Much developmental work was done on a flechette rifle, and developmental work has been done on a number of other flechette munitions.

It is argued that flechettes go straight through the body without causing much harm and are, therefore, not "inhumane." But if large numbers of flechettes are ejected from a munition, there will be a danger of multiple wounding. If flechettes strike the body with sufficient velocity, they will tumble, causing severe wounds; such high velocities would have been obtained with the flechette rifle, and work was done to accelerate numbers of flechettes with a propellant charge so as to increase their wounding effect.

A third trend in fragmentation weapons is an increase in the area covered by a munition. Aircraft-launched "cluster bombs" spread hundreds of little "bomblets" over areas that may be several hundred meters on each side. Tiny anti-personnel mines can be laid from the air in thousands; there are also bomblet-filled artillery shells up to the 16-inch (406 mm.) caliber, and mine-filled shells are in development.

It has been said that without a cluster bomb, a military commander would have to use many high explosive bombs, destroying buildings and

killing many people, and that the cluster bomb merely serves to “keep heads down” while other airplanes are flying over; a cluster bomb, in this view, is the more humane weapon. But a cluster bomb with a large area coverage is arguably indiscriminate by nature if used (as has occurred in recent conflicts) over an area within which there are civilians; and if some of the bomblets are duds, or if they have delay fuzes, the area will be unsafe for some time after the attack.

It is to be hoped that the discussions in Lugano will clear the way for a series of bans on “inhumane” weapons. Public opinion would seem to favor such bans: the use of napalm and cluster bombs engendered public protest in several countries in recent years. The prospects for bans are perhaps especially good where the military usefulness of a weapon is in doubt (as with napalm) or where a weapon has not yet found much international acceptance in military services (as with flechette weapons, anti-personnel cluster bombs, and aerially delivered anti-personnel mines). The discussions of “inhumane” weapons may also serve to encourage ordnance engineers and procurement authorities to eschew weapon designs that tend especially to cause bad wounds or have indiscriminate effects.

**Eric PROKOSCH**