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The panels of this conference have touched upon a myriad of new technologies, ranging from energy weapons, to drones, robots, satellite technology and space weapons and cyber technology. Some of these technologies are already deployed on today's battlefields, others are still in the realm of science fiction.

The discussions revealed a number of overarching themes, providing food for thought and for further research and thinking. I cannot attempt to summarize all of them, but I would like to highlight five aspects that appeared to be recurring.

Firstly, our discussions revealed a measure of **uncertainty about the facts**. It is not always clear what is technically feasible in today's theatres of war, and less clear what will be feasible in the future and when. It is also not always clear what the humanitarian impact is – of weapons that are already deployed, like drones; that are ready to be deployed, like cyber attacks; or that might be deployed in the future, like autonomous robots. To what extent does this uncertainty hamper our ability to ensure that all new technologies in warfare comply with international humanitarian law? My impression is that while the uncertainty about the specificities and impact of some of these technologies does pose a challenge to applying the law to them, this challenge should not be overstated.

In cyber warfare, for instance, anonymity and interconnectedness of computer networks around the world do indeed seem to pose very serious questions about the way international humanitarian law will play out in the cyber realm. More exchange will need to take place between scientists and lawyers to get clarity on these issues. On the other hand, there seems to be little doubt that cyber attacks are feasible now and can potentially have devastating effects on civilians and civilian infrastructure, for instance by causing the disruption of air control systems, or electricity or water supply systems. Most of us have little or no understanding of how information technology works, and yet there are a number of things we already know and can already say about which effects would be lawful or not should they occur. Most of us do not know how to fly airplanes, but we know about the effects of aerial bombing. In this sense, we should concentrate on the effects of technology we see today in warfare ('in the real world'), and we will probably be able to go a long way in being able to make reasoned statements about the applicability of international humanitarian law and the lawfulness of specific means and methods of warfare in cyber space.

Secondly, the fact that **new technologies remove soldiers further and further away from the battlefield** was a matter of recurring discussion. Many discussants pointed out that remoteness of the soldier to the enemy is nothing fundamentally new. Yet, it is also apparent that a common feature of the new technologies under discussion is that they appear to carry distance one step further – be it by remote-controlled weapons, cyber weapons or robots.

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* Also available at: http://www.icrc.org/eng/resources/documents/statement/new-weapon-technologies-statement-2011-09-13.htm

More thinking is required about the consequences of these remote means and methods of warfare. Firstly, what is the consequence of their use for the definition, the extent of the battlefield? Some have argued that if drones can be flown or cyber attacks launched from anywhere in the world, then anywhere in the world becomes a battlefield. This would in effect be an endorsement of the concept of a 'global battlefield', with the consequence that the use of force rules allowing for incidental civilian loss and damage under the IHL principle of proportionality extend far beyond the scope of what has until now been accepted. This is a notion that the ICRC does not follow.

Long distance means and methods of warfare also pose some questions as to the relationship between, *on the one hand, the use of new technologies to keep soldiers out of harm's way by limiting their exposure to direct combat, and on the other hand their humanitarian impact for the civilian population*. It is probably impossible to say that the remoteness of soldiers from the battlefield will by itself create greater risks for civilians. But given the aversion of many societies and governments to risk the lives of their soldiers, there is a danger that the tendency towards so-called zero casualty wars could lead to choices of weapons that would be dictated by this concern, even if it went to the detriment of the rules of international humanitarian law that protect civilians against the effects of hostilities. Just like high altitude bombing might be safer for soldiers but also in certain circumstances indiscriminate and unlawful, so new technologies, however protective for the troops, will always have to be tested for their compatibility with humanitarian law and in particular their possible indiscriminate or disproportionate effects. This, however, requires that we get a better understanding about the effects of such technologies, in particular their precision and their incidental effects – not only in abstract technological terms but in the way they are concretely being used.

This leads me to a third point, which is a certain **lack of transparency about the effects of certain weapons for the civilian population** – not their potential effect in the future, but the effect of those technologies that are already being used. For instance, there is controversy about the effects of drones: no one appears to know with any measure of certainty the loss of civilian lives, injury to civilians and damage to civilian infrastructure that has been caused by drone attacks. The lack of objective knowledge constitutes a great impediment for the assessment of the lawfulness of weapons or their use in particular circumstances. Transparency in recording the humanitarian consequences of new technologies would certainly be of benefit in this respect – because it would already take into account not only the abstract technical specificities but integrate the actual way in which they are used.

As we heard, however, **new technologies can actually also be tools for more transparency, namely to support the witnessing, recording and investigation of violations**. We heard a very interesting presentation about this in relation to satellite images used by UNITAR to investigate violations during armed conflict. Other technologies come to mind: for instance DNA technology which can sometimes complement traditional forensic science methods, or simple devices such as mobile phone cameras that have been used to record violations. The limits of

using images to illustrate or prove violations in armed conflict, in particular war crimes, is not something new and it is well known that images rarely speak for themselves. But new technologies – together with traditional means, in particular witness accounts – can contribute to uncovering certain violations and this must surely be welcomed.

A fourth recurring theme was that of **responsibility and accountability for the deployment of new technologies**. Whether new technologies will reduce our capacity to allocate responsibility and accountability for violations remains to be seen. As a starting point, it is worth recalling that international humanitarian law parties to conflicts (states and organised armed groups) and international criminal law binds individuals. Just as a number of speakers pointed out, I am not convinced that we have reached the end of accountability with autonomous weapons. Even if artificial intelligence were to be achieved and autonomous systems deployed in armed conflicts, would it not always be the case that any robot is at some point switched on by a human being? If that is the case, then that individual – and the party to the conflict – is responsible for the decision, however remote in time or space the weapon might have been deployed from the moment of the attack. It is a topic that reminds me of Goethe's poem *Der Zauberlehrling* ('the sorcerer apprentice'), who unleashed a broom with destructive artificial intelligence and UAV capacity. Both the apprentice and the magician himself certainly bore their share of responsibility and the magician ultimately had to put his house in order. In cyber space on the other hand, allocation of responsibility does appear to present a legal challenge if anonymity is the rule rather than the exception.

Lastly, the most recurrent overarching theme was maybe that **technology, in itself, is neither good nor bad. It can be a source of good and progress or result in terrible consequences at worst**. This is true most of the time. Transposed to technologies that are weaponised, this means that most weapons are not unlawful as such; whether their use in conflict is lawful or not depends on the circumstances and the way in which they are used.

This being said, some weapons are never lawful and have been banned – blinding laser weapons or landmines, for instance. The same will be true for new technologies: the lawfulness of new means and methods of warfare will usually depend on their use, but it is not excluded that some weapons will be found to be inherently indiscriminate or to cause superfluous injury or suffering, in which case they will have to be banned. This is why the principle reflected in Article 36 of Additional Protocol I that States should verify, when developing new means and methods of warfare, whether their use will be compatible with international humanitarian law is so critical.

If we can draw a lesson from past experience – for instance the deployment of the nuclear bomb – it is that we have trouble anticipating the problems and disasters that we might face in the future. Some say that robots or other new technologies might mean the end of warfare. If robots fight robots in outer space without any impact on human beings other than possible economic loss this would look like the world of knights fighting duels on a meadow outside the city gates, a fairy outcome short of war. But since this is a very unlikely scenario, we have to

focus on the more likely scenario that technologies in armed conflicts will be used to cause harm to the enemy, and that this harm will not be limited to purely military targets but will affect civilians and civilian infrastructure.

So, indeed, let us not be overly afraid about things that might not come – this was the credo of many speakers here in San Remo. But let us nonetheless be vigilant and not miss the opportunity to recall, every time it is needed, that the fundamental rules of international humanitarian law are not simply a flexible moral code. They are binding rules, and so far they are the only legal tool we have to reduce or limit, at least to a small extent, the human cost of war. A multi-disciplinary meeting such as this roundtable is an excellent means to advance towards this goal.