



**Extremely Stealthy and Incredibly Close:
Drones, Control, and Legal Responsibility**

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ABSTRACT

Drone technology is not only a game changer, it also triggers obligations. If we recast our perception of drones as solitary planes to one of a comprehensive technology with extensive surveillance and control capabilities, we encounter new and crucial legal implications of the use of drones in armed conflict. To make its argument, this article first places the surveillance and control capabilities of drone technology within the context of the European Convention of Human Rights. The European Court of Human Rights has found that the Convention applies in a number of cases where a member state exercised control and authority over persons or territories outside Europe. The article argues that this may affect the legal basis for European states that employ drones for attacks. The second part of the article examines the implications of the surveillance capabilities of drone technology for the principle of precaution in international humanitarian law. In addition to identifying so far overlooked legal implications arising from the employment or availability of drone technology for attack in armed conflict, the article raises the more general question of how the laws concerning armed conflict should be applied in an era of total surveillance.

I. INTRODUCTION

The recent legal controversies about the use of armed unmanned aerial vehicles (UAVs), which we shall here simply call “drones,” primarily spring from the disputed lawfulness of Israel and the CIA’s “personality strikes” and the CIA’s “signature strikes”. “Personality strikes” refers to the targeted killing of persons in cases where the targeter “... has a high degree of confidence that it knows the precise identity of the targets,”¹ while “signature strikes” denotes attacks on persons based on behavior patterns assumed to indicate enemy activity.² The legal discussions this provokes revolve around questions such as the deprivation of life without due process of law,³ the violation of territorial sovereignty, the right to self-defense, the use of battlefield equipment in situations other than armed conflict and the use of non-military pilots for drone strikes (in the case of the CIA), and civilian casualties.⁴ These questions and the ways they have been addressed stem not so much from drone technology itself, but rather from the nature of the operations for which armed drones are being employed,⁵ and they primarily concern the lawfulness of individual acts carried out by the use of single drones.

However, if we consider the broader surveillance properties of both currently available and future drone technology combined with their armed capability, some so far unaddressed legal implications come into sight. First, the rapidly growing surveillance capacity of drone technology combined with ever more sophisticated armed capabilities may suggest a capability for exercising a degree of control and authority over territories and persons that may trigger the extraterritorial application of the European Convention of Human Rights (ECHR)⁶, and

thereby making an array of human rights obligations topical to drone attacks if carried out by member states. Apart from the United Kingdom, European states have not as of yet used drones for armed attacks. However, there is little doubt that in the future armed drones and remote-controlled fighter planes will become standard military equipment for most European states. This makes it relevant to consider how drone technology may trigger obligations under the ECHR, in particular the duty to investigate killings. The legal implications of using drone technology within the context of the ECHR may also be used as a point of departure for discussing other human rights obligations ensuing from the employment of drone technology.

Secondly, the surveillance capacity of drone technology in combination with the withdrawal of risk for pilots affects the application of the precautionary principle in international humanitarian law (IHL). The argument is that the drone technology, in addition to its strategic value, offers effective precautionary measures in the form of the capability of making pre-operational assessments of targets. Drone technology therefore raises the question of a humanitarian law obligation for states to employ drone technology *if available* to exhaust all feasible means of information gathering if any doubt exists as to whether an attack may lead to civilian casualties. At the same time drone technology dissolves classical dilemmas with regard to balancing military efficiency with precaution, dilemmas which spring from concerns for personnel, material and urgency. As will be argued, the obligation to employ drone technology for precaution should apply both to drone attacks as well as to other weapon systems.

While this article examines the specific question of how a wider concept of drone

technology affects the interpretation and application of the precautionary principle under IHL and the question of extraterritorial obligations under the ECHR, its aim is wider. The argument concerning the ECHR and the precautionary principle points at some broader legal and moral implications of drone technology. Drone technology will develop at great speed in the coming decades, and we will without doubt see the development of surveillance capabilities and weapon technologies that today we cannot imagine the full scope of. This future scenario should not only be addressed in terms of precision weapons. Surely we need to consider how the possibility of *seeing and knowing* in armed conflict triggers moral and legal obligations. Even in a near future, ground attacks may no longer be lawful without engaging drone technology for the purpose of precaution.⁷ It is as if drone technology lifts the “fog of war” from critical aspects of the use of armed force. In this manner, the revolution drone technology presents us with in the context of armed conflict is also about legal responsibility.

To make its argument the article first recasts the legal problematic related to targeted and signature killings from what could be called “single drone strikes” to “the use of a comprehensive combined weapon and surveillance technology.” It then places this concept in the context of the ECHR by looking at how recent court decisions from the European Court of Human Rights have applied the ECHR extraterritorially in cases where the court found that European states exercised effective control and/or authority in territories outside Europe. Next, the principle of precaution in humanitarian law will be examined in relation to drones as a comprehensive surveillance and weapon technology. Finally, the article reflects on how the examination of drone technology,

ECHR and the precautionary principle in IHL may guide our image of drones in future armed conflict.

2. RECASTING THE DRONE PROBLEMATIC

The state-of-the-art armed drones are silent, remote-controlled, slow-speed planes. A predator drone stalls at around 100 km/h. They can stay airborne for more than 24 hours and numerous drones can in principle be flown over a small area much more easily than conventional planes, thus allowing multiple surveillance platforms simultaneously. Drones may be flown at low altitude without compromising pilot security. The drones’ surveillance accessories include 1.8 gigapixels⁸ cameras, infrared cameras, electromagnetic spectrum sensors, gamma ray sensors, biological sensors, and chemical sensors. They can eavesdrop on cell phones and radio as well as intercept wireless internet communications. What is more, drone technology is currently developing at great speed. New cameras and data transfer technologies allow for increasingly advanced information collection. Soon we will see better software for analyzing the huge volumes of drone surveillance material and, sooner or later, also algorithms for biometric identification of persons. We will see in-flight laser charging of drone batteries.⁹ And we will see cheaper drones,¹⁰ smaller drones, tiny, beetle-sized drones, whirring around close to the ground. In fact, militaries already use hand-sized miniature drones for reconnaissance.¹¹ Although the range and functions of such ‘nanodrones’ remain limited they do constitute a small revolution in the field of intelligence, surveillance and reconnaissance.¹²

Finally, drones will be increasingly robotized. Autonomous weapon systems raise many questions,¹³ yet notwithstanding the weapon aspect, the mere surveillance advantage of robotized drones flows directly into this article's main argument about how "seeing triggers obligations."

Despite recent technological triumphs, it is uncertain exactly what we can expect. A 2012 report from the United States Congressional Research Service foresees that, "In the near future, law enforcement organizations might seek to outfit drones with facial recognition or soft biometric recognition, which can recognize and track individuals based on attributes such as height, age, gender, and skin color."¹⁴ This mirrors some of the general public as well as academic expectations, if not to say anxieties, towards drone technology. Yet, facial recognition technologies still suffer from difficulties in capturing useable, high quality images of moving persons (or from moving cameras) from a distance, as well as in developing algorithms for processing data.¹⁵ When such technologies have matured, we will be faced with the challenge of packing the technology into a compact drone-loadable format. On the other hand, facial recognition has become one of the most explored technologies in biometrics, and technological quantum leaps almost certainly loom around the corner. Even if we will not see drones equipped with biometrical identification technologies "in a near future," drone-based surveillance technology will certainly advance very quickly.

Armed with precision weapons, drone technology becomes a comprehensive surveillance and weapon system with extensive capabilities for patrolling and controlling territories. The moral, political and legal discussions on the use of drones as weapon systems therefore need to view

drones not as solitary remote-controlled planes. Rather, we need to consider the entire technology as it is applied or can potentially be applied in a given situation.

What we need is to change our view on drones as a simple, remote-controlled "killing-from-a-distance" tool: drones are *not* only the last step in a technological development moving from the stone sling to the longbow to present-day cruise missiles and, finally, the drone. Rather, they are a medium for proximity. By employing drones, we see things we have never seen before, and we will soon see even more. Drone technology brings us closer than ever to the enemy, and conducting killings by drone can be a very intimate form of killing. As one leading expert writes, "These controllers have an intimate view of their targets by video streaming, following them for hours and days, and they can also see the aftermath of a strike, which may include strewn body parts of nearby children."¹⁶ In the same way, a Reaper pilot expresses that "We have the capability to see (unlike fast jets) the effects of our weapon strikes in relatively close up detail."¹⁷ We shall not here consider drone technology's socio-ethical implications for the practice of killing. It suffices to note that the virtual proximity enabled by drone technology is critical to its general capability.

To be sure, the most noteworthy historical trajectory of drone technology is not the history of remotely deployed force; it is the history of seeing the enemy in war: a history moving from hilltops and watchtowers to the use of binoculars, balloons and airplanes and then on to radar, night vision, satellites...and drones. Proximity and visibility rather than remoteness should therefore be our main point of departure in analyzing the legal and moral implications of drone technology for the use of armed force.

3. DRONES AND THE EUROPEAN CONVENTION OF HUMAN RIGHTS

Because drone technology offers an effective apparatus for exercising control over territory and persons, the employment of armed drones in armed conflict may trigger certain human rights obligations. This section examines the legal implication of the control capability of drone technology in the context of European human rights law. Recent practice from the European Court of Human Rights demonstrates a progressive extraterritorial application of the ECHR, which has certain implications for the use of drone technology. To understand this, we must briefly examine a number of central cases decided by the Court.

First of all, as concluded by the International Law Commission, armed conflict will rarely if ever affect either humanitarian law treaties or non-derogable human rights treaties.¹⁸ However, it is one thing that treaties are in effect and another thing that they are applicable to a given concrete situation. Should a European state employ combat drones in conducting attacks we would need to consider in each particular case whether the ECHR binds the state operating the drones. This question first of all concerns the extraterritorial application of human rights treaties. Human rights law was originally constructed as a regime governing the relationship between the state and persons on the state's territory. The ECtHR has made it clear that the term "jurisdiction" in Article 1 in ECHR reflects this "ordinary and essentially territorial notion of jurisdiction", and that as a general principle the ECHR does not apply outside the European area.¹⁹ Yet, as we shall see, during the last decade, the Court's practice reveals a progressive

extraterritorial application of ECHR,²⁰ which appears relevant to the questions of drone technology and legal responsibility.

The case of *Bankovic v. Belgium* (2001) has been invoked in the legal literature to explain why the ECHR is not relevant to drones. In this case, the Court was faced with the question of whether the NATO member states could be held responsible under the Convention for damage to civilian buildings and several civilian deaths caused by the airstrike on the Serbian Radio Television headquarters in Belgrade. The Court stated that a non-territorial basis of jurisdiction is "[...] exceptional and requires special justification in the particular circumstances of each case."²¹ In this case, the Court found, missiles and bombs fired from aircraft were not considered a sufficient "jurisdictional link" and consequently the ECHR did not apply.²² "Under this reasoning", writes one legal scholar, "drone operations in Yemen or wherever would be just as excluded from the purview of human rights treaties as under *Bankovic*."²³ This is probably true in the case of a solitary drone. However, if the situation involves the use of the full surveillance and precision weapon capability of drone technology, it seems rather doubtful that the judgment in *Bankovic* provides the yardstick. In this case, we should look to more recent developments in European human rights law, which reveal a quite progressive, extraterritorial application of the Convention, which seems highly relevant for the employment of drone technology in armed conflict.

In the cases of *Issa v. Turkey* (2004)²⁴ and *Öcalan v. Turkey* (2005)²⁵ the Court widened its interpretation of "jurisdiction." The Court's jurisprudence now based itself on "an expansive but simple rationale for extraterritorial jurisdiction: 'control entails

responsibility.”²⁶ *Issa v. Turkey* concerned an incident in 1995 in which the Turkish military forces killed civilians during a cross-border attack in northern Iraq that “aimed at pursuing and eliminating terrorists who were seeking shelter” in this area. In other words, a typical counterinsurgency operation. The Court indicated that the ECHR was applicable since the killing of Issa happened in a space under the direct control of Turkey’s military forces. In *Öcalan v. Turkey*, the Court found the ECHR to be applicable to acts in which Turkish secret agents abducted Abdullah Öcalan in Nairobi Airport in Kenya and flew him back to Turkey for prosecution. The judgment found that the direct hands-on link between the Turkish agents and Öcalan was enough to invoke the obligations of ECHR extraterritorially, even in spaces remote from the Convention’s juridical space (Europe).

The Court seemed to follow a mixture of the “authority and control over territory” rationale of *Issa* and the “direct control over individuals” rationale of *Öcalan* when it ruled in the case of *Al-Skeini & Others v United Kingdom* (2011).²⁷ *Al-Skeini* concerned the death of six Iraqi civilians in the Iraqi town of Al-Bashra in 2003. The case involved typical “collateral damage” casualties, such as anticipatory shooting of approaching suspicious persons and stray bullet death, but also death by crude violence. Relatives of the victims brought claims before the ECtHR against the UK for failing in its procedural obligation to investigate the killings. So the case was not about the lawfulness or otherwise of the killings, but about the lack of investigation. The Court held that the UK had *effective control* over the territory in question through its military presence, thus establishing the sufficient jurisdictional link to find the Convention applicable. In the words of the Court: “... the UK (together

with the United States) assumed in Iraq *the exercise of some of the public powers normally to be exercised by a sovereign government*. In particular, the UK assumed authority and responsibility for the maintenance of security in South East Iraq. In these exceptional circumstances, *the Court considers that the United Kingdom, through its soldiers engaged in security operations in Basra during the period in question, exercised authority and control over individuals killed in the course of such security operations, so as to establish a jurisdictional link between the deceased and the UK for the purposes of Article 1 of the Convention.*”²⁸ Therefore, the court concluded, the UK had breached its procedural obligations under Article 2 of the Convention.

3.1 Drones and the question of effective control

It is clear that there is a world of a difference between the high altitude bombing of Serbia, which produced the Bankovic case and long-drawn-out surveillance-intensive drone campaigns. The question is, however, whether the employment of drone technology with armed capability may give rise to similar legal arguments about control through “military presence,” which until now has led the ECtHR to apply the ECHR extraterritorially. There can be no doubt that the surveillance of areas or individuals by drones involves a strong aspect of control.²⁹ The question centers on the nature and intensity of this control, and how the Court would view it in the light of its jurisprudence.

If we look at the environment which produced the Al-Skeini case, we see, without taking sides or any intention to criticize, a fairly disordered security operation in the difficult and dangerous environment of the town of Basra in Iraq. It was a period where

“crime and violence were endemic,” and “... the Coalition forces in South East Iraq, including British soldiers and military police, were the target of over a thousand violent attacks in ... 13 months.”³⁰ Soldiers needed, first and foremost, to protect themselves. The six killings that gave rise to the Al-Skeini case comprised one stray bullet death, the killing of a man at a funeral who held a gun at the ceremony (in Iraq it is customary to discharge guns at funerals), the shooting of a person in a house during a night raid, the killing of the driver of a “suspicious-looking” vehicle who defied the soldier’s signals to stop, as well as two cases of abusive behavior on the part of the soldiers causing the death of detainees.³¹

Apart from the abuse, the testimonies included in the Judgment bear witness to hectic situations where soldiers assumed limited room for precaution. The question of what kind of ‘effective control’ was actually being carried out in Basra must be raised. Furthermore, for our case, the question of whether drone technology may enable an exercise of control over individuals from the air that is equal to that of combat troops patrolling the streets of Basra has to be posed.

Drone technology may – so far – be of little use when conducting night raids inside houses, approaching people in the streets to seek out immediate reactions, or in operating checkpoints. However, when it comes to observing houses, roads, infrastructure, junctions, open fields, villages, and urban areas, as well as tracing persons moving by foot or vehicle, drones are effective. If long surveillance periods (that today mostly lie ahead of targeted or signature killings) combined with enforcement capability in the form of instant weapons delivery does not imply an intense form of “effective control”, then what is “effective control”? Given that

the Court found a jurisdictional link between the United Kingdom and a woman killed by a stray bullet in Basra, then why could and should not such a jurisdictional link also emerge out of several weeks of close surveillance of a person ending in a targeted killing? With regard to some situations, it is difficult to see why drone technology would not imply an even more effective control over persons or territory than troops on the ground. Here it simply needs to be considered how drone technology enables stealth and longstanding surveillance. This may be different from, and yet in some situations more comprehensive than what may be effected by indiscrete, heavily-equipped combat troops patrolling on the ground.

3.2 Drones and the question of authority

Furthermore, the criteria of “the exercise of some of the public powers normally to be exercised by a sovereign government” laid down by the Court also needs to be considered. Compared to the control criteria, which may spring from simply imposing force on individuals, as in the case of Öcalan, the “public power” criteria requires an analysis of the political context in which drone technology is employed. Let us take the drone campaign in Pakistan as our example, even though the United States is not, of course, bound by the ECHR. The campaign is legitimized exactly by the lack of any effective public powers in the tribal areas, and the United States’, at least implied, claim to be carrying out a security operation that would normally be exercised by a sovereign government to root out terrorism.

If such a claim was made by a European states, could it in combination with a strong presence through technology give rise to

jurisdiction under ECHR? Whatever the legal basis may be for the drone campaign in Pakistan,³² the political and legal basis for the drone campaign there is obviously very different from the situation in Basra, which produced Al-Skeini, and where the United Kingdom (during the Coalition Provisional Authority) formally assumed some of the responsibility for the maintenance of security in South East Iraq. Unless a similar situation develops, the question of a possible applicability of the European Convention of Human Rights to the situations employing drone technology for the kind of operations we see United States undertaking in Pakistan is unlikely to invoke the authority argument. Then we would be back at the Bankovic judgment. Not as a precedent, making drone strikes lawful, but as a matter of revisiting the control argument from the perspective of drone technology. The question is how the Court would have decided in Bankovic if the targeted building and its surroundings had been under close-up surveillance for weeks or even months combined with a continuously ready strike capability. How would the Bankovic decision have looked like if the attackers had exact knowledge of how many persons were in that building?

Although this argument is somewhat speculative, if it proceeds to have merit in the European Court of Human Rights, it adds a new legal dimension to the use of drone technology for targeted and signature strikes – as well as for more regular combat attacks. In other words, the shift in concept from “single drone” mission to “drone technology” as a comprehensive surveillance and weapon system transforms the implicit concepts of responsibility under human rights law, at least for European states. Yet the tipping point towards control-based jurisdiction is for the Court to decide. However, if the Court

should find that control-based jurisdiction over persons may spring from soldiers or security forces on the ground but not from drones in the sky, it would indeed also provide the debates about drones with an interesting jurisprudence.

3.3 Drones and investigatory duties

Provided that the ECHR may be applied to certain situations stemming from the employment of armed drones, then what kinds of obligations would apply? Human rights regimes generally contain provisions on derogation from the regimes that bring them into line with IHL norms when it comes to the right to life in armed conflict.³³ The ECHR permits derogations from the right to life “... in respect of deaths resulting from lawful military acts of war.”³⁴ Legal scholars mostly agree that, “... at the end of the day, the concrete operation of the principles of proportionality seems broadly equivalent in both branches of international law.”³⁵ In short, the room for killing and collateral damage remains under IHRL, even if a stricter precautionary norm applies. Yet on the procedural side, when it comes to the question of investigating alleged violations of the right to life under ECHR Article 2 in order to determine whether an act in contrary to IL has taken place, IHRL contains much stricter and far more detailed norms and practice than IHL as to both pre- and post-incident assessments.³⁶ If ECHR applies to a given situation, the investigatory duties also follow the human rights regime.³⁷

The ECtHR has confirmed its jurisprudence with regard to investigative duties in cases of possible breaches of ECHR Article 2 in a number of cases, most recently in the Al-Skeini case.³⁸ The material issue in the Al-Skeini case was not the lawfulness *vel non* of the killing of

Iraqi civilians by British soldiers. It was about the UK's failure to investigate the killings properly. The Court clearly established that when the ECHR applies extraterritorially, state parties have a positive obligation to conduct independent and effective investigations into possible breaches of ECHR Article 2. Consequently, the Court found that the lack of proper investigation is a breach in itself: it is simply illegal not to investigate. Case law from the ECtHR has clearly established that an effective investigation must be "capable of leading to a determination of whether the force used in such cases was or was not justified in the circumstances."³⁹ However, we should of course expect the Court to scale down investigatory duties in impenetrable environments. Provided that the ECHR applies to a killing executed by drone technology, the question of how to view the duty to investigate in such circumstances arises. As the *Al-Skeini* case established, it is for the ECtHR to decide, first, whether the Convention applies and, second, whether the investigatory duties have been fulfilled.

It is furthermore worth noticing that the *Al-Skeini* case established that relatives of civilian victims of international military operations have access to have their case heard in the national civilian courts of the state responsible for the operation; and that if the state is unwilling or unable to consider the case, the relatives of the victims may file their case with the ECtHR. This presents us with an entirely new legal situation, which alters the juridical relation between the state employing armed forces and civilians in the field.

A new authority has been installed in the relationship between states' military forces and civilians, one which applies applied to drones as a weapons system. Suddenly it is no longer the national European military justice systems that determine which international

laws apply or whether international duties have been fulfilled, but the Court in Strasbourg.

The duty under ECHR to investigate civilian casualties adds a procedural dimension to the question of drone technology and international law. One could argue that drone technology provides much better investigatory data than ground operations since every step of a drone attack is recorded and stored. On the other hand, drone technology without ground support leaves few options for post-operation investigations. Further, verifying the combatant status of casualties is mostly impossible.

In the field of international humanitarian law, the question of investigative duties is only weakly codified, and relies first of all on the assessment of the commander. To get a sense of what civilians may then require from European military forces deploying drone technology when it comes to investigating civilian casualties, we could look at the ECtHR practice with regard to Article 2 (the right to life). In case of *McKerr vs. UK*, which concerned the duty to investigate of the police, the Court found that there should be some form of effective official investigation when individuals have been killed as a result of the use of force.⁴⁰ Furthermore, the Court held that contracting states must take "... whatever reasonable steps they can to secure the evidence concerning the incident, including, inter alia, eyewitness testimony, forensic evidence and, where appropriate, an autopsy which provides a complete and accurate record of injury and an objective analysis of clinical findings, including the cause of death,"⁴¹ as well as protect the independence of the investigation. Importantly, the Court noted, "There may be cases where the facts surrounding a deprivation of life are clear and undisputed and the subsequent inquisitorial examination may legitimately be reduced

to a minimum formality. But equally, there may be other cases, where a victim dies in circumstances which are unclear, in which event the lack of any effective procedure to investigate the cause of the deprivation of life could by itself raise an issue under Article 2 of the Convention.⁴² The question, however, remains whether the ECtHR will accept the use of a weapon system which rules out the possibility of post-action investigations in low intensity conflicts. Notwithstanding, the answer to the question lies with the Court in Strasbourg, and not with the national military commander.⁴³

4. THE PRINCIPLE OF PRECAUTION

This section places our extended concept of drone technology in the context of the precautionary principle in International Humanitarian Law. The obligation to take due care in attack has been affirmed by belligerents for a long time. According to Article XXVII of the 1899 Hague Convention, “In sieges and bombardments all necessary steps should be taken to spare as far as possible edifices devoted to religion, art, science, and charity, hospitals, and places where the sick and wounded are collected, provided they are not used at the same time for military purposes.” Article 2(3) of the 1907 Hague Convention (IX) set up that the commander of a naval force, “shall take all due measures in order that the town may suffer as little harm as possible.” Furthermore, that “If for military reasons immediate action [against naval or military objects located within an undefended town or port] is necessary, and no delay can be allowed the enemy, ... [the commander of a naval force] shall take all

due measures in order that the town may suffer as little harm as possible.” However, the principle of precaution was not codified as a clear international law principle before the 1977 Additional Protocol I to the Geneva Conventions, Article 57, which reads:

1. In the conduct of military operations, constant care shall be taken to spare the civilian population, civilians and civilian objects.
2. With respect to attacks, the following precautions shall be taken:
 - (a) those who plan or decide upon an attack shall:
 - (i) do everything feasible to verify that the objectives to be attacked are neither civilians nor civilian objects and are not subject to special protection but are military objectives within the meaning of paragraph 2 of Article 52 and that it is not prohibited by the provisions of this Protocol to attack them;
 - (ii) take all feasible precautions in the choice of means and methods of attack with a view to avoiding, and in any event to minimizing, incidental loss of civilian life, injury to civilians and damage to civilian objects;
 - (iii) refrain from deciding to launch any attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated;
 - (b) an attack shall be cancelled or suspended if it becomes apparent that the objective is not a military one or is subject to

- special protection or that the attack may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated;
- (c) effective advance warning shall be given of attacks which may affect the civilian population, unless circumstances do not permit.
3. When a choice is possible between several military objectives for obtaining a similar military advantage, the objective to be selected shall be that the attack on which may be expected to cause the least danger to civilian lives and to civilian objects.
 4. In the conduct of military operations at sea or in the air, each Party to the conflict shall, in conformity with its rights and duties under the rules of international law applicable in armed conflict, take all reasonable precautions to avoid losses of civilian lives and damage to civilian objects.
 5. No provision of this Article may be construed as authorizing any attacks against the civilian population, civilians or civilian objects.

It is generally agreed that Article 57 did not constitute a new rule but rather codified customary law.⁴⁴ Today, it forms a most critical component in international humanitarian law and is reflected in the military manuals of most states.⁴⁵ The provision applies to the immediate situation of a military attack, and not so much to the possible long-term effects of attacks on health, the economy or the environment.⁴⁶ The principles enshrined in Article 57 become relevant the moment

a military objective is chosen as a proportionate target. It is linked to both the principle of proportionality – as the formulation “everything feasible” places precaution between military necessity and humanitarian obligations – as well as to the principle of distinction by obligating attackers to do everything feasible to verify the target. Due precaution may build on years of intelligence or on a sound, split-second judgment.

Scholars have argued that in an armed conflict scenario the principle of precaution is more than often unworkable. Warning civilians may be impracticable since it reveals tactics, and pre-operational data collection may be impossible due to urgency and security issues. However, even if it may be hard to satisfy completely the principle of precaution as reflected in Article 57, it still constitutes a most crucial standard governing the conduct of armed force. It is clear that the principle also applies when drones are engaged for armed attacks.

The principle of precaution has been treated in a number of scholarly contexts,⁴⁷ but here it suffices to note how the obligation to gather and assess information on potential targets stands as the main obligation of the principle as formulated in Article 57: not before all feasible information has been collated may proper precaution be said to have been taken. If commanders are uncertain about the exact status of the target, they are obliged to exhaust available means for verifying the target. This implies that “... a bombing raid that is carried out on the basis of mere suspicion as to the military nature of the target amounts *ipso facto* to a violation of the principle of distinction” – even if the attack produces no damage at all.⁴⁸ One of the enduring critiques of drone-launched signature strikes is based exactly on this norm.

4.1 Drones and the principle of precaution

How does our extended concept of drone technology affect the application of the principle of precaution? Like most IHL principles, the meaning of “all feasible precaution” in Article 57 is contextual. The primary variables of Article 57 may be identified as “... the time necessary to gather and process the additional information, the extent to which it would clarify any uncertainty, competing demands on the ISR [intelligence, surveillance, reconnaissance] system in question, and risk to it and its operators.”²⁴⁹ In this regard, drone technology removes a number of classical dilemmas related to precaution, namely 1) precautionary measures vs. strategy considerations, i.e. the time to gather and process additional information; 2) precautionary measures vs. personnel considerations, i.e. the risk to the soldiers and the operators of weapon systems; 3) the precautionary measures vs. materiel considerations, i.e. the risk to the weapon systems. Another important variable is the question of whether additional information would add anything at all to the assessment of a given situation. Here, this aspect may be resolved by simply limiting our discussion to situations where additional information potentially could make a difference.

4.2 Strategy considerations impacting on “all feasible precaution”

Regarding *urgency*, here defined as a military situation in which “all feasible precaution” demands less pre-operational information gathering, we may notice how signature strikes and targeted killings more often than not are carried out in the absence of actual fighting, and mostly rely on careful targeting

considerations. Hours, days or weeks of surveillance may lie ahead of the attack. This leaves plenty of time for considering and taking precautionary steps. It has been argued that there is “strong evidence that UAVs are better, not worse, at noncombatant discrimination.”⁵⁰ That may or may not be true; statistics indicate the latter.⁵¹ The argument here is that in a strategic landscape void of the kind of urgency we have traditionally connected with armed conflict, such as hectic combat situations or the sudden necessity of protecting strongholds, the ‘feasibility’ parameter of balancing between urgency and precaution changes. In situations of targeted killings and signature killings, urgency does not stem from battle distress. It springs solely from the risk of missing the chance of killing a suspected or confirmed target. Still, the principle of precaution applies. The question drone technology presents us with is what “all feasibility of precaution” may mean in a situation devoid of the kind of military urgency the principle originally aimed at? Furthermore, the availability of drone technology obviously attaches new precautionary obligations to many other weapon systems. The relatively swift deployment time of drones may, in many situations, require militaries to deploy drones in advance of bombing or shelling.

4.3 Personnel considerations impacting on “all feasible precaution”

The same fundamental change in the balancing of precaution versus necessity follows from the fact that the use of drone technology removes the risk for pilots and intelligence, surveillance, and reconnaissance staff. It is lawful to balance the protection of own military personnel against the risk of

harming civilians or civilian infrastructure. While “Rules of engagement designed to protect civilians tend to place soldiers at greater risk; ... and rules that stress force protection usually come at the expense of civilians” this “... duty to reduce harm to enemy civilians ... does not entail an obligation to assume personal life-threatening risks.”⁵² The risk connected with sending reconnaissance divisions into hostile environments therefore has a direct bearing on the scope of “feasible” precautions. Moral arguments have been made for and against weighting troop protection higher than civilian lives, but the arguments all build on the dilemma of weighing troop protection against the scope of feasible precaution.⁵³ Drone technology, however, removes this dilemma since no human lives are put in danger on the side of the drone flying state. Apart from the urgency of military necessity to prevent targets from escaping, the only balancing of “feasible” precautions we see in the context of drone technology is a balancing of the cost of conducting investigations and deploying sufficient technology and the risk of harming civilians. Today we can get incredibly close without risking any personnel and in an extremely stealthy manner, without even requiring the sacrifice of any strategic advantage.

4.4 Materiel considerations impacting on “all feasible precaution”

The dilemma of balancing feasible precaution against the protection of military material may typically surface in a situation where precautionary measures must be compromised in order to save military equipment from being destroyed or falling into enemy hands. In the context of airpower, the dilemma has

traditionally been closely joined to personnel considerations. Flying jets within the range of surface-to-air missiles endangers the lives of the pilots and at the same time risks the material loss of extremely expensive equipment. Drone technology unyokes the personnel and materiel dilemmas, and since the personnel dilemma has ceased, only the material dilemma remains. The risk of losing civilian lives is inherently difficult to balance against risk of losing war equipment. Nevertheless, the difference between a US\$400 million F22 Raptor fighter jet and the US\$40 million Predator drone, or the US\$100,000 ScanEagle,⁵⁴ is considerable and should make a difference to such calculations.

4.5 Drone technology and the precautionary principle

The obligation to take all “feasible precautions” depends on what “feasible” is balanced against. In this regard, drone technology recasts conventional dilemmas attached to Article 57 of Add. Protocol 1 from 1977. Out of the dilemmas of strategy, personnel and materiel, only the latter remains. This is a good example of how it is can be “... hard to talk about morality when it comes to new military technology”⁵⁵ because sometimes, as in this case, new technology, upon closer inspection, simply modifies conventional dilemmas.

Then, what could the material content of “all feasible means” be considered to signify in the context of drone technology? How much surveillance capability must be employed to satisfy the principle of precaution under international humanitarian law? Today the United States military has more than 7,500 drones of different sizes. And if we take a step into the near future this number will be much

higher and certainly amplified by all sorts of new technology including micro drones. If a state has the capability to fly small drones through windows and peek into house, could this become required as a mandatory pre-operational precautionary measure in the use of armed force?⁵⁶ If means are available, would precaution include flying a micro drone up in the face of the possible target to record biometric data? Will it even be legal at all to target with only a solitary drone, or will combat drones be required to be convoyed by a swarm of scout drones? Where should the line of precaution be drawn?

5. CONCLUSION: DRONE TECHNOLOGY'S IMPLICATIONS FOR THE FUTURE USE OF ARMED FORCE

Looking back on recent armed conflicts in Libya, Afghanistan, Iraq, Kosovo, and Kuwait, all of which were fought with cutting-edge western military technology, we see that weak intelligence has been the dominant cause of combat-related collateral damage. Furthermore, weak intelligence results more often than not from an understandable reluctance to send in reconnaissance troops to collect the necessary information to guide weapon delivery. The surveillance capability of drone technology provides an effective remedy by collecting real-time intelligence. Combined with other forms of surveillance technology, we are moving swiftly towards an era where the “fog of war” has become history. For the high tech military, armed conflicts move pixel by pixel towards ultra high definition and total transparency. This is not only a question of whether states want transparency or not. Rather, insofar as proper

technology is available, states are obliged by international law to move it in that direction. The critical question of the use of armed force in the age of drone technology is about the moral and legal obligations that total surveillance entails.

Therefore we need to look at drones not only as a game changer: they are also an “obligation trigger”. And the critical concept of drone technology is not remoteness but proximity. The legal situation we are presented with is not different from the situation of a satellite-based surveillance platform and precision weapons located at a distance: it is not at all different from the obligation to use binoculars to check out a target before firing the mortars. What matters are surveillance, seeing and knowing, and the ability to hit a target within seconds. Drone technology represents the avant-garde of intelligence collection and targeting. Rolled into one, they simply alter not only the threshold of feasible precautionary measures but also their very rationality and they also recast the principle of precaution in both ground and air force operations.

In this context we may see a peculiar interplay between IHL and human rights law. In attacks, the principle of precaution under IHL obliges states to deploy extensive surveillance measures if available. If a state fulfills these obligations by employing drones, a situation may be created that implies an exercise of control and authority that again may trigger extraterritorial human rights obligations, at least in the context of ECHR. The other way around, if a state demonstrates unwillingness to employ available drone technology so as to avoid human rights obligations, that could mean a breach of the precautionary principle under IHL. And even though the ECHR applies only to its member states, it nevertheless enshrines

moral obligations which have certain broader applicability.

Now, the last but important conclusion shall be that the argument made here for how the currently available drone technology triggers the principle of precaution applies not only to drones. Rather, it applies to all forms of use of armed force. Any argument in this article is as valid for other means of armed force as it is for drone-based weapons. If a state possesses drone technology, and if the deployment of this technology may potentially reduce unnecessary harm from armed attacks, the state is obliged to employ the technology. In this manner, drone technology triggers precautionary obligation across all weapons systems.

NOTES

¹ Heller, J. K. (2012): "One Hell of a Killing Machine: Signature Strikes and International Law", *Journal of International Criminal Justice* (forthcoming), p. 2.

² *Ibid.* p. 4.

³ In 2012, The Center for Constitutional Rights (CCR) and the American Civil Liberties Union (ACLU) filed a lawsuit alleging that senior CIA and military officials had violated the U.S. Constitution and international law by authorizing and directing drone strikes that resulted in the deaths of three U.S. citizens including a 16-year-old boy, in Yemen last year. [<http://www.aclu.org/national-security/rights-groups-file-challenge-killing-three-americans-us-drone-strikes>, last visited 20 February 2012]

⁴ For an overview of the legal debates related to the use of armed drones, see Blank, R. L. (2012): "After 'Top Gun': How Drone Strikes Impact the Law of War", *University of Pennsylvania Journal of International Law*, 33, 3, pp. 675—718; Human Rights Institute, Columbia University (2011): "Targeting Operations with Drone Technology: Humanitarian Law Implications. Background Note for the American Society of International Law Annual Meeting", Columbia Law School, Human Rights Institute, March 25, 2011; Lewis, M. W. (2012): "Drones and the Boundaries of the Battlefield", *Texas International Law Journal*, 47, 2, pp. 294—314; O'Connell, M. E. (2011): "Remarks: The Resort to Drones under International Law", *Denver Journal of International Law and Policy*, 39, 4, pp. 585—600; Orr, A. C., (2011): "Unmanned, Unprecedented, and Unresolved: The Status of American Drone Strikes in Pakistan under International Law", *Cornell International Law Journal*, 44, 3, pp. 729—752; Paust, J. J. (2010): "Self-defense Targeting of Non-State Actors and Permissibility of U.S. Use of Drones in Pakistan", *Journal of Transnational Law and Policy*, 19, 2, pp. 237-280; Schmitt, M. N. (2010): "Drone Attacks under the *Ius ad Bellum* and *Ius in Bello*: Clearing the 'Fog of Law'", *Yearbook of International Humanitarian Law*, 13, pp. 311—326; Vogel, R. J., (2010): "Drone Warfare and the Law of Armed Conflict", *Denver Journal of International Law and Policy*, 39, 1, pp. 101—138.

⁵ See "Targeting Operations with Drone Technology: Humanitarian Law Implications", Background Note for the American Society of International Law Annual Meeting Human Rights Institute, Columbia Law School, March 25, 2011, p. 2.

⁶ European Convention for the Protection of Human Rights and Fundamental Freedoms, art. 15, Sept. 3, 1953, 213 U.N.T.S. 222.

⁷ Here we may look to the growing use of drone-based surveillance by the civil police. The apprehension towards the use of drones in this context springs from the risk that drone technology likely implies an intrusion into the private affairs of the citizens. Unless we assume that completely different ethical standards apply at home and abroad, the ethical dilemmas related to privacy and surveillance should be considered also when drones are used in the non-Western world. Also here drones are an intrusive form of control. In this way the uneasiness with regard to the control capability of civilian drones flows into the argument of this article: Control is a material feature of drone technology no matter the political

or geographical context. See for example Crump, C. (2011): "Protecting Privacy from Aerial Surveillance: Recommendations for Government Use of Drone Aircraft", Report by American Civil Liberties Union. The report argues that "we need a system of rules to ensure that we can enjoy the benefits of this technology without bringing us a large step closer to a "surveillance society" in which our every move is monitored, tracked, recorded, and scrutinized by the authorities." (p. 1).

⁸ Madrigal, A. (2013): "DARPA's 1.8 Gigapixel Drone Camera Could See You Waving At It From 15,000 Feet", *The Atlantic*, February 1 2013; See also Leininger, B. et. al (2008): 'Autonomous Real-time Ground Ubiquitous Surveillance – Imaging System (ARGUS-IS)', in Suresh, R. (ed.): *Defense Transformation and Net-Centric Systems 2008* [available at <http://144.206.159.178/ft/CONF/16415556/16415570.pdf>, accessed 1. March 2013].

⁹ Brown, M. (2012): "Lockheed uses ground-based laser to recharge drone mid-flight", *Wired*, (July 12, 2012) [available at <http://www.wired.co.uk/news/archive/2012-07/12/lockheed-lasers>, accessed 20. February 2013]

¹⁰ Shanker, T. (2013): "Simple, Low-Cost Surveillance Drones Provide Advantage for U.S. Military", *New York Times*, January 24, 2013.

¹¹ United Kingdoms Ministry of Defence (2013): "Miniature surveillance helicopters help protect front line troops", News published: 4 February 2013 [available at <https://www.gov.uk/government/news/miniature-surveillance-helicopters-help-protect-front-line-troops>, accessed 24. February 2013]

¹² Singer, P.W. cited in Shanker, T. (2013): "Simple, Low-Cost Surveillance Drones Provide Advantage for U.S. Military", *New York Times*, January 24, 2013.

¹³ Herbach, J.D. (2012): "Into the Caves of Steel: Precaution, Cognition and Robotic Weapon Systems Under the International Law of Armed Conflict", *Amsterdam Law Forum*, 4, 3, pp. 3—20 ; Coeckelbergh, M. (2011): "From killer machines to doctrines and swarms, or why ethics of military robotics is not (necessarily) about robots", *Philosophy & Technology*, 24,3, pp. 269-278; Schulzke, M. (2011): "Robots as Weapons in Just Wars", *Philosophy & Technology*, 24, 3, pp 293—306.

¹⁴ Thompson, R. M. (2012): "Drones in Domestic Surveillance Operations: Fourth Amendment Implications and Legislative Responses", United States Congressional Research Service, Report# 7 5700, September 6, 2012, p. 3f.

¹⁵ Hu, S., R. Maschal & S. S. Young (2012): "Face Recognition Performance with Superresolution", *Applied Optics*, 51, 18, pp. 4250—4259; Orozco-Alzate, M. and Castellanos-Domínguez, C. G. (2009): "Trends in Nearest Feature Classification for Face Recognition—Achievements and Perspectives", in Chacon, M. I. (ed.): *State of the Art in Face Recognition*, ISBN: 978-3-902613-42-4, InTech, DOI: 10.5772/6637. [Available at http://www.intechopen.com/books/state_of_the_art_in_face_recognition/trends_in_nearest_feature_classification_for_face_recognition-achievements_and_perspectives, accessed 29 February 2013]; Lucas L. D. & Nissenbaum, H. (2012): "Facial Recognition Technology. A Survey of Policy and Implantation Issues", New York University: The Centre for Catastrophe Preparedness and Response, pp. 15ff.

¹⁶ Lin, P. (2011): "Drone-Ethics Briefing: What a Leading Robot Expert Told the CIA", *The Atlantic*, DEC 15 2011.

¹⁷ Lee, P. (2012): "Remoteness, Risk and Aircrew Ethos", *Air Power Review*, Vol. 15, 1, pp. 1—20, p. 15.

¹⁸ As concluded in the International Law Commission's 2005 study on the effect of armed conflict on treaties, "... armed conflict will rarely if ever affect humanitarian law treaties, treaties with express provisions as to their applicability during armed conflict, treaties creating a permanent status or regime, treaty provisions codifying jus cogens norms, nonderogable human rights treaties, treaties governing intergovernmental debt and diplomatic conventions." International Law Commission (2005): 'The effect of armed conflict on treaties: an examination of practice and doctrine. Memorandum by the Secretariat', fifty-seventh session, Geneva, 2 May-3 June 2005 and 4 July-5 August 2005. United Nations General Assembly, A /CN.4/550

¹⁹ In a broad sense, the term "jurisdiction" may be said to describe any authority over a certain area or certain persons. According to Article 1 of the ECHR, the member states "(...) shall secure to everyone within their jurisdiction the rights and freedoms defined in Section I of this Convention". Accordingly, member states are only responsible for acts and omissions falling within its "jurisdiction".

²⁰ European Court of Human Rights Press Unit (2012): 'Extra-territorial jurisdiction of ECHR Member States. Factsheet – Extra-territorial jurisdiction', [available at http://www.echr.coe.int/NR/rdonlyres/DD99396C-3853-448C-AFB4-67240B1B48AE/0/FICHES_Jurisdiction_extraterritoriale_EN.pdf]

²¹ ECtHR, *Bankovic and Others v. Belgium and Others* (Grand Chamber) [2005] ECtHR 52207/99 (12 Dec 2001), paras. 59 & 61.

²² *Ibid.*, para. 82.

²³ Milanovic, M. (2012): "Al-Skeini and Al-Jedda in Strasbourg", *European Journal of International Law*, 23, 1, pp. 121-139, p. 130.

²⁴ ECtHR, *Issa v. Turkey* [2004] ECtHR 31821/96 (16 Nov. 2004).

²⁵ ECtHR, *Öcalan v. Turkey* (Grand Chamber) [2005] ECtHR 46221/99 (12 May 2005).

²⁶ S. Miller (2009): "Revisiting Extraterritorial Jurisdiction: A Territorial Justification for Extraterritorial Jurisdiction", *European Journal of Human Rights*, 20, pp. 1223—1246, p. 1233.

²⁷ ECtHR, *Al-Skeini & Others v. United Kingdom* [2011] ECtHR 1093 (7 July 2011).

²⁸ *Al-Jedda v United Kingdom*, paras. 149—150.

²⁹ A recent survey has documented how United States' drone strikes in Pakistan impact on the daily lives of ordinary civilians in the areas where the strikes are carried out. The survey reports considerable psychological effects and behavioral changes, including how "(...) (s)ome community members shy away from gathering in groups, including important tribal dispute-resolution bodies, out of fear that they may attract the attention of drone operators. Some parents choose to keep their children home, and children injured or traumatized by strikes have dropped out of school. Waziris told our research-

ers that the strikes have undermined cultural and religious practices related to burial, and made family members afraid to attend funerals." While such reporting cannot substantiate what constitutes "effective control" in the legal sciences, it does indicate how drone campaigns produce at least a sense of being controlled effectively among the people living in the affected areas and consequently change their behavior. New York University Center for Human Rights and Global Justice & Stanford International Human Rights & Conflict Resolution Clinic (2012): "Living Under Drones: Death, Injury and Trauma to Civilians from U.S. Drone Practices in Pakistan."

³⁰ ECtHR, *Al-Skeini & Others v. United Kingdom* [2011] ECtHR 1093 (7 July 2011), para 161.

³¹ ECtHR, *Al-Skeini & Others v. United Kingdom* [2011] ECtHR 1093 (7 July 2011), pp. 18—26.

³² We shall not go into this discussion here, but suffice noting how the United States has not formally identified the rules of international law they consider to provide the basis for their drone campaigns. Yet commentators mostly agree that "states may invoke the right to self-defense as justification for the extraterritorial use of force involving targeted killings", even if it "... has been a matter of debate" whether such a right also permits the use of force against non-state actors. For a good overview over the positions in the debate about the legality of the drone campaign under international law, see Orr, A.C. (2011): "Unmanned, Unprecedented, and Unresolved: The Status of American Drone Strikes in Pakistan under International Law", *Cornell International Law Journal*, 44, 3, pp. 729—752.

³³ For instance, in the case of *McCann v. UK*, the ECtHR found that death caused by a blunder in the application of lethal force does not necessarily constitute a breach of Article 2. *McCann v. United Kingdom* (1995) 21 ECHR, para 97. See also Doswald-Beck, L. (2006): "The right to life in armed conflict: does international humanitarian law provide all the answers?", *International Review of the Red Cross*, 88, 864, pp. 881—904.

³⁴ Article 15 (1) of the ECHR reads: "In time of war or other public emergency threatening the life of the nation any High Contracting Party may take measures derogating from its obligations under this Convention to the extent strictly required by the exigencies of the situation, provided that such measures are not inconsistent with other obligations under international law."

³⁵ Gaggioli, G. & Kolb, R. (2007): "A Right to Life in Armed Conflicts? The Contribution of the European Court of Human Rights", *Israeli Yearbook of Human Rights*, 37, pp. 115—163, p. 138; Gioia, A. (2011): "The Role of the European Court of Human Rights", in O. Ben-Naftali (ed.): *International Humanitarian Law and International Human Rights Law*. Oxford: Oxford University Press, pp. 201—245.

³⁶ See Chevalier-Watts, J. (2010): "Effective Investigations under Article 2 of the European Convention on Human Rights: Securing the Right to Life or an Onerous Burden on a State?", *The European Journal of International Law*, 21, 3, pp. 701—721; Mowbray, A. (2002): "Duties of Investigation under the European Convention on Human Rights", *The International and Comparative Law Quarterly*, 51, 2, pp. 437—448; See also United Nations (1989): 'Principles on the Effective Prevention and Investigation of Extra-legal, Arbitrary and Summary Executions, recommended by Economic and Social Council Resolution

1989/65 of 24 May 1989; Principles on the Effective Investigation and Documentation of Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment. See also Schmitt, M (2011): "Investigating Violations of International Law in Armed Conflict", *Harvard National Security Journal*, 2, pp. 31—84, pp. 49ff.

³⁷ The apparent norm conflict between IHRL and IHL has often been dealt with by applying the international law principle of *lex specialis*. According to this principle, the provision that offers the most detailed regulation with regard to the specific situation is granted precedence. See Milanovic, M. (2010): "A Norm Conflict Perspective on the Relationship Between International Humanitarian Law and Human Rights Law", *Journal of Conflict and Security Law*, 14, 3, pp. 459—483, pp. 462f.

³⁸ *Ergi v. Turkey* (23818/94) [1998] ECHR 59 (28 July 1998); *Rod v. Croatia* App. No. 47024/06 (18 Sept. 2008); *Ulku Ekinci v. Turkey*, App. No. 27602/95 (16 July 2002).

³⁹ *McKerr v. United Kingdom*, 2001-111 Eur. Ct. H.R. 475, para. 111.

⁴⁰ *McKerr case*, para 111.

⁴¹ *McKerr case*, para 113.

⁴² *McKerr case*, para 193.

⁴³ It would of course be naturally to continue the discussion of extraterritorial human rights obligations in the context of the International Convention of Civil and Political Rights (ICCPR). This will be done in subsequent versions of this article. As for now, it shall only be mentioned that the control capabilities of drone technology gives rise to similar arguments about extraterritorial obligations under the ICCPR as those that we have examined in the context of the ECHR.

⁴⁴ Henckaerts, J. & Doswald-Beck, L. (2009): *Customary International Humanitarian Law*. ICRC and Cambridge University Press, vol 1., pp. 51—65.

⁴⁵ *Ibid.*

⁴⁶ For instance, the principle of precaution in environmental law applies to situations of armed conflict (depleted uranium, destruction of oil wells, use of poison) and is to be considered a strategy to guide policy in the face of scientific uncertainty about the environmental and health consequences of human action. Wexler, L. (2006): "Limiting the Precautionary Principle: Weapons Regulation in the Face of Scientific Uncertainty", *University of California Davis Law Review*, 39, pp. 459—629.

⁴⁷ See Quéguiner, J. (2006): "Precaution under the law governing the conduct of hostilities", *International Review of Red Cross*, 88, 793, pp. 794—821.

⁴⁸ *Ibid.*, p. 798.

⁴⁹ Schmitt, M. (2005): "Precision Attack and International Law", *International Review of the Red Cross*, 87, 859, pp. 445—466, p. 461.

⁵⁰ Strawser, B.J. (2010): "Moral Predators: The Duty to Employ Uninhabited Aerial Vehicles", *Journal of Military Ethics*, 9, 4, pp. 342—368, p. 352.

⁵¹ See New York University Center for Human Rights and Global Justice & Stanford International Human Rights & Conflict Resolution Clinic (2012): "Living Under Drones: Death,

Injury and Trauma to Civilians from U.S. Drone Practices in Pakistan", pp. 29—53.

⁵² W. Smith, T.W. (2008): "Protecting Civilians...or Soldiers? Humanitarian Law and the Economy of Risk in Iraq", *International Studies Perspectives*, 9, pp. 144—164, p. 146; last paragraph quoted from Benvenisti, E. (2006): "Human Dignity in Combat: The Duty to Spare Enemy Civilians", *Israel Law Review*, 39, pp. 81—109, p. 93.

⁵³ For a discussion of the dilemma, see Blum, G. (2011): "The Laws of War and the 'Lesser Evil'", *The Yale Journal of International Law*, 35, 1, pp. 2—67, pp. 59f; Luban, D. (2011): "Risk Taking and Force Protection", Georgetown Public Law and Legal Theory Research Paper No. 11—72; Smith, T.W. (2011): "Protecting civilians...or soldiers? Humanitarian law and the economy of risk in Iraq", *International Studies Perspectives*, 9, pp. 144—164.

⁵⁴ Shanker, T. (2013): "Simple, Low-Cost Surveillance Drones Provide Advantage for US Military", *New York Times*, January 24, 2013.

⁵⁵ Singer, P.W. (2010): "The Ethics of Killer Applications: Why Is It So Hard To Talk About Morality When It Comes to New Military Technology?", *Journal of Military Ethics*, 9, 4, pp. 299—312.

⁵⁶ This question is somewhat analogous to the question addressed by Gabriella Blum in her article 'On a Differential Law of War.' The question she poses is whether the United States, as the strongest military power in the world, should be bound by stricter humanitarian constraints than its weaker adversaries? In other words, do different capabilities cause differentiated responsibilities? See Blum, G (2011): "On a Differential Law of War", *Harvard International Law Journal*, 52, pp. 163—208.

