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LETHAL AUTONOMOUS WEAPONS SYSTEMS IN INTERNATIONAL HUMANITARIAN LAW AND HUMAN RIGHTS LAW

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Introduction

Carl Schmitt concluded his masterpiece *Der Nomos der Erde* recalling a famous Hegel's claim, according to which 'during the transition from feudalism to absolutism humanity needed gunpowder, *and immediately it was there*'.[1] New forms of power require appropriate forms of projecting force against the 'other': every human age has thus the weapon it needs. Schmitt wrote this at the very end of the 1940's, a decade in which humanity bore witness to the destructive power of an unprecedented weapon, the nuclear bomb. It had been the exhibition of that uncontrollable force to play such an important in terminating World War II. At that moment the entire world was awaiting no less than forty years of uninterrupted tension between two poles (the United States and the USSR), under the constant threat of a nuclear war capable of ending human presence on earth.

Which weapon does our epoch need? Nuclear weapons are still here: one could say that the nuclear threat has never been so material as it is today. Nuclear weapons are, however, patently unsuitable for today's conflicts: the 'Global War On Terror' cannot be reasonably win by wiping out entire regions of the world. When the 'terrorist threat' flourished – one may say in the aftermath of 9/11 –, States sought for something less resounding than nuclear bombs, but equally efficient to challenge the new enemies. They also felt that in order to maintain public support to their actions they needed to win 'the hearts and minds' not just of the opposing side, but first and foremost of *their* citizens. They had to show that their new 'war' was bloodless on their side and rigorously compliant with applicable rules: in short, that they were *just*. States need technological efficiency and standoff from harm, and immediately *armed drones* were there.

[1] Schmitt, *The* Nomos *of the Earth in the International Law of the* Jus Publicum Europaeum (translated and annotated by Ulmen), New York, 2006, at 321.

Initially used for intelligence, surveillance and reconnaissance (ISR), drones were eventually armed with a view to optimizing the use of lethal force: to dispose of operational intelligence but to have to wait for 'boots-on-the-ground' to reach the operational site was perceived inefficient, not to say worrisome in terms of legal compliance (the scenario potentially changing while ground troops being on the move, thus nullifying the advantage gained through drones). Besides, after two World Wars and other military campaigns in which victory seemed impossible to reach even sacrificing the best soldiers (e.g. the U.S. campaign in Vietnam), public opinion vigorously reclaimed 'no boots-on-the-ground'. This was the price to pay in order to wage a 'war' at the end of last century; Kosovo and the concept of tactical aerial bombing that characterized that military operation are quite telling in this sense. One could not think of a better timing for armed drones to appear: a perfect instrument to project lethal force at minimum exposure to risk. Armed drones *immediately were there* to allow their users to operate in a highly hostile, changing environment, only few seconds separating the decision to engage the target, fire and hit; additionally, their operator was safely located miles away, taking few to no risks for his/her physical integrity (except for some forms of post-traumatic stress disease that drone pilots appear to suffer from).

The introduction of this new platform to deliver lethal force has not been neutral on the general understanding of what warfare – and generally any similar scenarios where lethal force is used by public authorities against individuals – is. The operational scenario – often 'outside the area of active hostilities' – began to be perceived as a *sanctuary*: no 'just' blood to be spilled in it, only that of the 'enemy'. French philosopher Chamayou brilliantly captured this feature of remotely-piloted technology in the expression '*métodologie de l'environnement hostile*':[2] in order to operate in an hostile environment (such as deep oceans or new planets) without physically leaving a safe environment (a laboratory, NASA headquarters), all you need

[2] Chamayou, *Théorie du drone*, Paris, 2013, at 35.

is an instrument (a bathyscaphe, a probe) allowing you to project your power without exposing your person.

The employment of drone technology in warfare works alike. Conceptually, the space is divided in two parts: an hostile zone and a safe zone. They are *asymmetrical* in the sense that are characterized by opposed features: danger/safety; foe/friend (a fairly Schmittian concept!); object/subject; terrorism/civilization, and so on. Interestingly enough, Chamayou sheds light on what is probably the most neglected aspect of remote warfare: being it placed in the hostile zone, the enemy is treated no differently from 'dangerous material';[3] it is the 'disease' that must be eradicated. The use of terminology derived from surgery (and medicine in general) is not random, quite the contrary; inadvertently it reveals how the enemy is understood by the attacker: as a *pathology*. The idea of a 'targeted killing' carried out through a 'surgical' drone strike cannot be closer to the idea of a surgical intervention, where the surgeon's watchful eye guides the hand in the patient's body without harming vital functions.

But human can (and actually do) mistakes: in surgery as well as in warfare. Being able to operate closer to the hostile environment, possibly counting on forces on the ground and not only on aerial superiority, is surely an asset; reducing risk of misjudgments without losing in efficiency would be a valuable asset too. Drones are still loaded with human presence, which exposes to poor and not-so-rapid decisions. A tool is needed that allow for operating with the same risk exposure granted by drones, but more quickly, more efficiently. *More humanely*.[4]

Our epoch needs robots, *and immediately they are there*. The term 'robot' is derived from the Czech word 'robota', which means 'servitude' or 'labor': thanks mainly to novels and Hollywood movies, everyone is familiar with the features that characterize robots. They are suitable for 'dirty, dull and dangerous' work, such as going to war and killing enemies.

[3] *Ibidem*, at 39-40.

[4] For the *écart sémantique* contained in this expression, see Conclusion.

They do not risk their life: no blood is therefore spilled on the 'just' part of the conflict – and public opinion would not raise any objection. They do not suffer from clouded judgments or emotional overreactions – all too human drawbacks responsible for the commission of the most atrocious crimes in history. They are even expected to comply with norms regulating the use of force better than humans would do; they are so good at this that their employment even in law-enforcement scenarios in homeland is even a welcomed step, as will be shown.

Our epoch is in desperate need of the perfect, humanitarian weapon. Humans have so repeatedly failed in making war more humane that our last hope left in this Pandora's box is machines. Surely there will be humans tasked with writing their algorithms (which, however, learning machines will be able to improve and adapt on their own); but at the end of the day the particular decision to use lethal force against a human target (the enemy combatant, the terrorist, the criminal, etc.) had better be entrusted to a robot. This is the challenge posed by Lethal Autonomous Weapons Systems (LAWS), robotic platforms that can perform critical functions – typically selection and engagement of human targets – without further human intervention. So far, States, military experts, policymakers, ethicists, scientists and lawyers have engaged in heated debates, both nationally and internationally, to discuss the feasibility and the opportunity of fielding these weapons.

The point of departure of this work is purely *legal*. As one of the most famous Latin maxim goes, *omne jus constitutum est hominum causa*.[5] Law is a product of humanity and is made for mankind. It is thus through the lens of humanity that the issues raised by LAWS will be tackled: humanity permeates the law regulating armed conflict (International Humanitarian Law – IHL) and the law regulating law-enforcement scenarios, i.e. outside armed conflict (International Human Rights Law – IHRL). LAWS,

[5] The famous Roman maxim is to be attributed to Hermogenianus, a jurist who was active at the end of the 3rd and the beginning of the 4th century A.D..

inasmuch as instruments projecting lethality absent particular human decision, may be deemed to subvert the very idea of *humanity* that has always (but seldom openly) inspired the two branches of international law recalled above. This notwithstanding, it is possible that 'humanity' acts as a blocking force, or, to put it *eschatologically*, as a 'power-that-holds-back'; the problem is that the notion of 'humanity', as well as that of 'human dignity', are probably the most undefined in the entire body of international law. To unleash LAWS against a human target has an impact on how we consider that target – and on the extent to which we acknowledge his/her *dignity*.

The way we define our enemies reflects on the weapon we choose to use against them. Again, Schmitt masterfully realized this some one hundred years ago, when discussing the impact of aerial warfare on the traditional relationship between enemies in modern wars. He claimed that the discovery of the new world and the birth of modern States brought about an important limitation in the conduct of warfare, which could be regulated – limited, and thus made more *humane* – by law (a *Nomos*). The new inter-State wars were conducted against an enemy that was considered as equal adversary. On the contrary, religious and internal wars were *total* wars, since they were conducted against an enemy that was viewed as a criminal; analogous features had maritime wars, to a certain extent, and submarine wars. Aerial warfare was entirely different: its dimension was horizontal (i.e. based on the equality of belligerents) no more but *vertical*, which implied a radical separation – *asymmetry* – between parties. Aerial warfare is essentially devoted to the *annihilation* of the other. It is not difficult to spot this very feature in contemporary drone campaigns: for instance, the U.S. operates its armed drones in Pakistan and Yemen ceaselessly in order to *destroy* terrorism (and terrorists inevitably). Annihilation is part and parcel of the very idea of targeted killing: eliminating rather than apprehending. LAWS push the bar even further: it is not a human that decides upon the death of another specific human, but a machine. The separation is total, asymmetry reaches an unprecedented stage: *asymmetry in humanity*, machines against humans. To be deemed

worthy of such treatment, the 'enemy' needs to be deprived of their dignity probably more than has ever been done: this stems from, but at the same time seemingly goes even further than, the traditional idea of 'criminalizing' some forms of enemy, for instance insurgents in civil strife.

Maybe a bit naively, Schmitt compares the man on the ground facing airplanes flying above him to a mollusk facing boats crossing on the sea surface. The man and the mollusk are both subject to a (also physically) *higher* power they are not in control of, but subject to. This is exactly the situation in which humans are placed when confronting LAWS. Sparrow employed a powerful expression to describe this new kind of hostility: LAWS's targets are like 'vermin' waiting for being 'exterminated'.[6] Analogously, Heyns labels LAWS as 'some kind of mechanized pesticide', to be employed against enemies that are reduced to 'zero-and-ones' algorithm can decipher.[7]

Such vocabulary should not surprise. It is the consequence of choosing such disruptive weaponry: 'if the weapons are conspicuously unequal' – added Schmitt – 'then the mutual concept of war conceived in terms of an equal plane is lacking. To war on both sides belongs a certain chance, a minimum of possibility for victory. Once that ceases to be the case, the opponent becomes nothing more than *an object of violent measures*'.[8] If the 'humanity', the 'dignity' of the targeted side is reduced to being an object of violence, it is debatable whether there still is humanity on the side of the applier.

This leads to the very beginning of the present work. My Supervisor once asked to us Ph.D. Candidates: 'Does not it seem strange that today everyone uses the term "dignity" so frequently? *Why* does it happen?'. He himself knows this very well, as he lectured on the subject of human dignity and international law at The Hague Academy of International Law in 2016.

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[6] Sparrow, *Robotic Weapons and the Future of War*, in Wolfendale-Tripodi (eds.), *New Wars and New Soldiers: Military Ethics in the Contemporary World*, 2001, at 11.

[7] See *Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns*, UN General Assembly, A/HRC/23/47 (9 April 2013), § 95.

[8] See Schmitt, *The* Nomos *of the Earth*, cit., at 320, italics mine.

It is quite hard to come up with an answer; but a plausible one might be: *because it is a kind of classic conditioning in those whose dignity is dramatically at stake*. Because autonomous weaponry is likely to rewrite the content of the notion of humanity; because the pessimistic take we have towards humanity is coupled with technological advancements whose gamble is to remove humanity and its drawbacks from lethal decisions. Every epoch has the weapons it needs. This assertion should be amended as follows: every epoch has the weapons it *deserves*.

The timing of both such huge technological change and the pessimism on humanity is too precise to be a curious coincidence. As for the first, it is the industrial-technical development of modern means of destruction that has made autonomous weaponry so attractive. As for the second, 'pessimism' is nothing more than the belief that since humans can be so 'inhumane', then it is better to trust machines to be genuinely humane *in lieu of humans*. There is a hiatus between humanity as 'mankind' (i.e. belonging to human race) and humanity as 'sentiment' (i.e. attitude of behaving humanely).[9] This requires great effort to reconstruct a notion of 'humanity' that can be applied to machines, i.e. non-humans. All this having been said, it becomes now easier to see why *today is the day* when discussing what humanity is and what it entails is really imperative. It cannot be further procrastinated.

The rise of machines taking lethal decisions on humans coincides with the descent of human presence at the single act of using force against individuals. In **Chapter I** focus is on the historical path that preceded the advent of LAWS and the technological features that make their employment a Copernican revolution in the history of the use of force between humans. Albeit standoff from harm ('remoteness') has always marked the history of warfare, LAWS take this idea to its extreme consequences: a human is geographically and temporarily segregated from the *specific* decision, which is left to the machine. On such premise,

[9] See *amplius* Conclusion.

'autonomy' is investigated with a view to clarifying its scope and its utility in contemporary applications of force.

Chapter II turns then to the issue of whether such degree of remoteness is consistent with the branches of international law regulating the use of force in armed conflict (IHL). I purposefully leave aside the issue of the use of force relevant in international relations – the so-called *jus ad bellum*, as codified by the Charter of the United Nations and regulated by customary law – as this would divert attention from the human being concretely subject to lethal force exerted by a machine. IHL applies to situations that amount to armed conflict, either of an international character or of a non-international character. The second is far more common today than in the past, when armed conflicts between States were the regular instrument to settle a dispute: it is not difficult to imagine that LAWS will be employed in counter-insurgency operations, urban warfare, and *guerrilla* scenarios. All this notwithstanding, a major question remains: *even if* all requirements for the use of force *in bello* are met, is the fact that it is up to a machine – and not a human – to decide when, how, and against whom to use force consistent with the fundamental principle of *humanity*? The content and the functions of this principle are thus explored, with due consideration to the role historically played by the so-called 'Martens Clause'.

Chapter III deals with the employment of LAWS outside armed conflict – typically in law-enforcement, counter-terrorism operations. Basic human rights that can be affected by LAWS are thus analyzed in turn, with a particular emphasis on the right to life. Again, assuming that LAWS are fielded that comply with all these requirements *even better than humans would do*, it remains to assess whether the absence of a concrete human decision is consistent with human dignity. As the principle of humanity in IHL, human dignity has made the object of considerable reflections, both by international judicial and quasi-judicial case-law as well as among scholars: can such notion be interpreted so as to require human presence at the very act of taking another human's life?

The path to the answer to both questions – which is basically the same *in bello* and *extra bellum*, as one is the human dignity they posit – is offered by an emerging notion of international law, that of 'Meaningful Human Control' (MHC). As shown in **Chapter IV**, many actors (States, NGOs, individual experts, and so on) resort to MHC to defend (or assess) the legality of LAWS: they claim that *some form* of human presence will (or must) be ensured when operating LAWS. It is not hard to see that the core of the question lies in how we interpret 'some form': is it sufficient to have a human operator at the monitoring stage? Considering that the operational tempo is believed to increase at speeds that human cannot keep up with, is it realistic to think of humans intervene *meaningfully* on the loop? What does 'meaningful' mean or, given its nascent status of general principle, what should it mean? Meaningfulness can be assessed in terms of 'responsibility' (i.e. the need to have someone for a wrongful action to be attributed to) and 'understanding' (i.e. the need to have someone for whatever action to be attributed to): our hypothesis is that even 'in the best of our possible worlds', where no wrongdoings are committed, the fact that LAWS lack moral agency (i.e. the capability of understanding the gravity of their actions) may breach international law *in that such lethal decisions contrast with the principle of humanity and of human dignity*. To put it differently: *if* the principle of humanity and of human dignity are sources of, respectively, IHL and IHRL, and *if* they can be interpreted so as to dictate some concrete standards in the use of force against humans (namely, that there must be MHC over each single decision to employ that force), *then* LAWS may turn out to be incompatible with IHL and IHRL *on this sole basis*. This would be enough to render their use unlawful – even absent a specific regulation, for instance by treaty law. A ban on LAWS – which many consider as unfeasible, inappropriate, if not counterproductive – would then be nothing more than declarative, and not constitutive, of an existing prohibition.

One may object that such a reasoning is too grounded in morality to be translated in legal terms. It is a fact that principles such as those of humanity and human dignity, as the category of 'general principles of

international law' they can be ascribed to, have always been employed to open the legal field to moral considerations: they stand like balconies that look out over the top floors of a building. Balconies are physically attached to the building, but by standing on them one can enjoy a view on the panorama surrounding him; by the same token, the principles of humanity and human dignity surely remain legal sources, but have always been conceived to make those who resort to them have a view of morality. They are structurally open to moral considerations.

Results are therefore discussed in the **Conclusion**. Even though the issue has tide connections with morality, (international) lawyers must not remain silent. Alberico Gentili provocatively claimed: '*Silete teologi in munere alieno*'. The maxim is not appropriate here: what is at stake is not a *munus alienum* for lawyers. Turning again to the balcony metaphor, it is for lawyers too to say a word on the view humanity should have. Mollusks against boats, vermin against pesticide, zero-and-ones against machines: is this that view?

Chapter I

LETHAL AUTONOMOUS WEAPONS SYSTEMS (LAWS): HISTORY, DEFINITION(S) AND KEY FEATURES

SUMMARY: 1.1 Introduction: A History of Remoteness in the Use of Force. – 1.2 Notion(s). – *1.2.1 Preliminary Remarks: What Autonomy is Not.* – *1.2.2 Autonomy as a 'Static' Concept.* – *1.2.3 Autonomy as a 'Dynamic' Concept.* – *1.2.4 An* Interim *Conclusion: a Working Definition of Autonomy.* – 1.3 Today's Autonomy. – *1.3.1 The Vital Importance of Autonomy for the Military.* – *1.3.2 Autonomy in Existing Weapons.* – 1.4 Tomorrow's Autonomy. – *1.4.1 Increased A.I. Capabilities.* – *1.4.2 Swarming Techniques.* – 1.5 Algorithmic Target Construction (ATC). – *1.5.1 Data Collection.* – *1.5.2 Data Re-elaboration: Algorithms in Action.* – *1.5.3 Outcome: 'Autonomous' Decision as 'Categorical' Decision.* – 1.6 Concluding Remarks.

The state which contemporary arms have reached
is as irrevocable as original sin.
(O'Connell, *Of Arms and Men*, 1989)

1.1 Introduction: A History of Remoteness in the Use of Force

If one wanted to sketch the history of the use of force across human ages, an appropriate angle to tackle the issue would be that of remoteness: much intuitively, the goal of a strategic use of force against individuals is maximizing the receiver's losses while minimizing their own. Projecting *lethality* without projecting *vulnerability* is a desirable outcome in war, as is in other context where force is used. However, from a diachronic perspective the need for combatants to be *integrally* removed from life-threatening risks seems to have flourished quite recently.

An example from Greek literature may help. In Book 13 of Homer's Iliad, Idomeneus, responding to his comrade Meriones (according to the tradition, his nephew) who had asked him for some spears to use in battle, vigorously defended the moral superiority of hand-to-hand combat: 'my

way is not to fight my battles standing far away from my enemies'.[10] Remoteness was perceived as an intolerable affront to true heroism, which required personal confrontation and thus exposure of one's own life to lethal risk. Acting otherwise – escaping from the enemy's range of shot – was a manifestation of cowardice deserving public shame.

'Chivalry' has been working as a *centripetal* force in warfare; however it has always been associated to different, more *centrifugal* forces projecting combatants far outside the space of battlefield. In other words, no chivalric code has ever really prevented the development and deployment of weapons that allowed their users to subjugate the enemy at distance, without exposing themselves to the risks associated with hand-to-hand confrontation. Heroism, while rhetorically bewitching, could not keep the pace with efficiency and risk reduction: and here is where our short history of the use of force begins.[11] It is a history where at least some evolutionary patterns emerge clearly: reliability of weapons, limited exposure to risks, efficiency.[12]

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[10] Homer, *Iliad*, translated by Lattimore, 2011, Chicago, Chapter XIII, 262-263.

[11] Which is essentially a history of weapons. For the purposes of this Paragraph, the notion of weapon that will be adopted is deliberately broad, so as to encompass both 'a thing designed or used for inflicting bodily harm or physical damage' (Concise Oxford Dictionary), 'a device that is constructed, adapted, or used to kill, injure, disorient, or threaten a person or to inflict damage on a physical object … [that] may act through kinetic energy or by other means, such as transmission of electricity, diffusion of chemical substances or biological agents or sound, or direction of electromagnetic energy' (see *Weapons Law Encyclopedia*, at http://www.weaponslaw.org/glossary/weapon).

[12] In other words, to say that the attempt to distance fighters from the battlefield has been a constant in the history of the use of force does not imply that there has been a monolithic 'evolutionary process' in the development of weapons, in which new weapons, more suitable for long-distance use, have in turn replaced old, less 'remoteness-friendly' weapons. Rather, it is more correct to state, if the notion of 'evolutionary process' is to be maintained, that different 'species' of weapons – both at long range and at short range – have evolved in parallel. As an example of this, the Ontario MK 3 Navy Knife – 6-inch stainless steel blade, compact, currently standard issue for the US Navy SEALs – or the Extrema Ratio Glauca B1 – a folding knife realized in cooperation with the French G.I.G.N., employed in counter-terrorism operations – are but among the latest development of the daggers that our ancestors realized by sharpening the horns of their prey. If it is true that the features and the materials of daggers have massively changed over the millennia, the concept of that weapon (i.e. penetrating the enemy's body in a hand-to-hand combat) has

First came *muscle-powered* force.[13] Given the scarce offensive capabilities of human body's structure (that lacks, for instance, tusks and claws), our predecessors found themselves compelled to resort to noncontiguous tools to confront their adversaries. Presumably, rocks and sticks, conveniently shaped and sharpened for hunting purposes, served as very primitive weapons, followed by more sophisticated clubs and daggers (obtained from limb bones and horns of antelopes) and eventually, some 1.5 million years ago, the *bola*.[14] The earliest depiction of men fighting against other men is the Mesolithic cave painting at Morela la Vella (Spain), and goes back to about 20,000 B.C.: fighters are depicted while employing what can be identified as rudimentary *bows*.[15] Their evolution were *crossbows*,[16] which inspired one of the earliest examples of mechanic artillery, namely the *catapult*.[17] Importantly, the kind of remoteness ensured by crossbows

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remained untouched. New daggers are sophisticated, deadly and efficient as never before; yet still, they remain daggers.

[13] See Cleveland (ed.), *Concise Encyclopedia Of The History Of Energy*, San Diego, 2009, at 301 ('[a]ll prehistoric, classical, and early medieval warfare was powered only by human and animal muscles').

[14] See O'Connell (R.L.), *Of Arms And Men*, Oxford, 1989, at 22, note 36.

[15] As a device taking advantage of mechanic energy, a bow provides its users with significant range, high speed and penetrating power, which made it ideal to maximize lethality and minimize exposure to risk. According to historians – and coherently with what has been said above – it cannot be excluded that the rise of this weapon was largely due to hunting purposes: in other words, the need to assure a satisfying amount of food for the band simply preceded the instinct to engage a fight with other humans; see *ibidem*, 22-25.

[16] Featuring a horizontal bow-like assembly mounted on a stock, the crossbow is capable of shooting projectiles (bolts, quarrels) at quite long distance and with high lethal potential. Presumably it was invented in Ancient China at least during the 6th Century B.C. (reference is made to in the famous Sun Tzu, The Art of War, Chapter V, No. 15: '[e]nergy may be likened to the bending of a crossbow; decision, to the releasing of the trigger'). Its use is recorded also in Europe around 400 B.C., when the Greeks used to employ crossbows named *gastrophetes* (literally 'belly shooters', as the device was cocked by resting the stomach in a concavity at the rear of the stock and pressing down with all of the user's physical strength).

[17] See *amplius* O'Connell, *Of Arms*, cit., at 65 (providing for a comprehensive explanation of historical development of catapults during the Hellenistic period). Invented under the reign of Dionysius I, tyrant of Syracuse: the then-primitive catapult –as etymology properly explains once again, constructed to 'piercing shields' – combined the conception of inflicting damage at distance with the potential of torsion (in lieu of tension). Such upgrade allowed catapults to throw a javelin as far as 700 meters; in addition, catapults could be

raised much concern during the XII century, which led to their (yet temporary) ban under Canon No. 29 of the second Ecumenical Lateran Council (1139).[18] The reasons for such a prohibition were two. *First*, the use of crossbows normally requires little training: unlike the archer, the crossbowman does not need to be physically vigorous, and his volume of fire is not limited by fatigue. *Second*, their use made it possible for simple peasants to shoot down knights, which looked intolerable to 'a political and social structure welded together with chivalric fighting skills acquired at a great cost'.[19]

The second phase is that of *chemical-powered* use of force.[20] China was at the forefront in discovering the recipe for a mixture of saltpeter, charcoal and sulfur, which was initially named as 'black powder'. Behind an innocuous, purely descriptive label, this powder concealed a disruptive force that had no precedents.[21] *Gunpowder*, and then *bullets*, gave birth to an entirely new species of weapons,[22] such as the harquebus, the flintlock musket and eventually the pistol.[23] Heavy artillery developed at the same

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loaded also with heavier projectiles (one-talent stones, for instance), rendering it a perfect weapon to resort to especially during prolonged sieges.

[18] Summoned by Innocent II and aimed at regulating various aspects of the life of Churchmen (e.g. celibacy) as well as other social issues (e.g. usury, truces in war), the Council also prohibited crossbows: '[w]e (the Supreme Pontiff) prohibit under anathema that murderous art of crossbowmen and archers, which is hateful to God, to be employed against Christians and Catholics from now on' (see Tanner (ed.), *Decrees of Ecumenical Councils*, Vol. 1, Georgetown, 1990, at 203). Incidentally, the circumstance that the prohibition of crossbows was unilateral – only against Christians – should not surprise the contemporary reader, since it was perfectly in line with the pre-Westphalian perception of war, grounded in the inherent inequality of belligerents.

[19] In the words of O'Connell, *Of Arms*, cit., at 95.

[20] Rightfully the transition from muscle- to chemical-powered use of force can be considered as the first 'revolution in military affairs': see Parker, *The Military Revolution. Military Innovation and The Rise of the West, 1500-1800*, Cambridge, 1996.

[21] See Andrade, *The Gunpowder Age: China, Military Innovation, and the Rise of the West in World History*, Princeton, 2016, at 13.

[22] Such bullets could be imparted kinetic energy 'an order of magnitude higher than that of a heavy arrow shot from a crossbow gun': see Cleveland (ed.), *Concise Encyclopedia*, cit., at 302.

[23] See O'Connell, *Of Arms*, cit., at 117-118.

pace.[24] Coupled with the capitalistic mentality that spread across Europe by the XV century,[25] more lethal weapons became available to more combatants, in a truly exponential trend. However, a veritable turning point of chemical-powered force occurred during the second half of the XIX century,[26] thanks to the discovery of *dynamite*: it was employed to produce practical high explosives to be transformed into munitions and to be delivered in shells, bombs,[27] and eventually missiles.[28] *Machine guns* too

[24] Cannons soon became the most efficient and destructive long-range weapon: Europeans got to experience the their destructiveness in the siege of Constantinople in 1453: see De Vries, *Gunpowder Weapons At The Siege Of Constantinople, 1453*, in Lev et al. (eds.), *War and Society in the Eastern Mediterranean: 7th – 15th Centuries*, Leiden-New York, 1997, at 343 ff.. In land warfare, new weapons, different in size and range, spread all over the West: from the rudimentary mortar and pestle to cast bronze muzzle-loaders and cast-iron cannons (which had most of their fortune at sea though). In naval warfare, it was thanks to the Arsenal at Venice that the power of guns was first incorporated in warring ships, combining a reinforced internal construction and a peculiar configuration for the placement of guns: the galleon, which made its appearance around the early years of the 17th century, was 'the archetype of all that would follow over the next three hundred years' (see O'Connell, *Of Arms*, cit., at 106).

[25] See *amplius* O'Connell, *Of Arms*, cit., at 111. The Author suggests that the very notion of hand-to-hand combat lost almost all its concreteness, thus becoming merely an abstraction of what confrontation used to be in the past. The rise of gunpowder led to a transformation of infantry, which reemerged on the battlefield after centuries of cavalry predominance: even more radically than crossbows, it was the handgun that bestowed lethal force upon low-trained neophytes.

[26] As a matter of fact the period that lasted until mid-1800s was as a matter of fact characterized by a technical improvement of short-, medium- and long-range weapons, with a view to advancing the mechanisms and correcting flaws, while their basic concept remained unaltered: it has been said that the first half of the 19th century represented a period of armament's stagnation, in which 'the sanguinary promise of chemical energy had been arrested … firearms were in their own way as dangerous to that world as nuclear weapons are to our own. Yet men learned to live with them': see O'Connell, *Of Arms*, cit., at 166.

[27] See *amplius* Cleveland, *Concise Encyclopedia*, cit., at 301. As for artillery, four were the major improvements in this period: the adoption of rifling (as long-range small weapons replacing old bayonets), the change to breechloading, better interior ballistics and better recoil mechanism; see Brodie and Brodie, *From Crossbow to H-Bomb. The evolution of the weapons and tactics of warfare*, Bloomington, 1973, at 139.

[28] The concept of missile evolved substantially since XIX century. They played a key role during World War II, which has been subsequently described as 'the missile age' (see Olsen (ed.), *A History of Air Warfare*, Washington, 2010, at 359). ballistic missiles were gradually incorporated into most States' arsenals by the 1950s. Suitable for almost every possible combination of land, sea and air strike, missiles were developed with intercontinental range (and named Intercontinental Ballistic Missiles, or ICBMs), that is capable of reaching

were invented in this period. Like crossbows during the XII century, machine guns were accused of being immoral weapons as they bestowed too unbalanced power on their users;[29] again, this argument did not lead to their prohibition. Instead, machine guns have been regularly employed in *aerial* warfare: more than high sea, the sky was the birthplace of entirely new horizons of remoteness in applying lethal force.[30] Also aerial bombings have been labeled as uncivilized means of warfare because of their indiscriminate use against civilian population centers; however, they proved efficient against purely military targets (particularly troop concentrations) and extremely valuable from the tactical point of view, and their use was eventually accepted.[31] In sum, if chemical power allowed for increased distance between the combatant and the target, technology advancements have been pushing remoteness even further, supplying delivery platforms that assure both accuracy and reduced exposure to risks.

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almost any point on Earth (and some in outer space) without being stopped on their way to the target (save for through highly sophisticated interception devices). The modern concept of ICBMs is but an evolution of rockets, first employed – venture a guess – by the Chinese in 1232 at the military siege of Kaifeng and then imported in Europe, where they were transformed into larger and longer-range weapons particularly apt to naval warfare.

[29] See O'Connell, *Of Arms*, cit., at 233: '[a] weapon which sprayed bullets like a garden hose sprayed water not only contradicted [the] values [of individual heroism], it promised to make a mockery of them'. Some episodes taken place in remote colonial territories – far from the disgust that European expressed while envisaging the use of machine guns at home – such as in Sudan and Tanzania by the end of the XIX century showed how simple it was to reach an unprecedented amount of destruction when the enemy did not dispose of the same armament. A battle fought with machine guns on one side was not a battle anymore, rather an 'execution'.

[30] Airships and airplanes emerged as instruments of waging war few years before World War I, being particularly suitable for reconnaissance and artillery spotting as well as tactical bombing: smaller in size than zeppelins and balloons, initially they were employed more in plane-versus-plane combat, and only later belligerents acknowledged the potential of inflicting damage on land from air: see *amplius* Olsen (ed.), *A History of Air Warfare*, cit., 2010, at 1-2.

[31] See O'Connell, *Of Arms*, cit., at 265. Among the advantages brought about by aerial superiority, there was the (relative) invulnerability of pilots. The adjective must be made explicit, for the eventuality of an aircraft delivering bombs on the enemy without being intercepted was rapidly contradicted by facts: antiaircraft guns before, and surface-to-air missiles later, were the natural tactical opponent of air bombing.

The last step evolutionary step, concerning much lethality, is undoubtedly represented by *nuclear-powered* use of force.[32] It is precisely because of their destructive power that nuclear weapons deserved some famous epithets, such as 'the absolute weapon', which was developed by 'wizards' eager to drag the entire planet in an 'Armageddon' scenario and consign mankind to 'oblivion'.[33] And it is precisely because of the impact that nuclear weapons had on targeted populations and broadly on public opinion that the doctrine of nuclear deterrence was born.[34] Nuclear-powered force witnesses to that the quest for destructiveness may eventually wipe out humanity: in this case, attempts at prohibiting nuclear weapons have been more (albeit not completely) successful than in the past.[35]

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[32] What is known as nuclear bomb, first tested at Alamagordo (New Mexico) on July 11, 1945 and then employed by the US against Japan later in August, rightly is considered as the second revolution in military affairs. For an infinitesimal shift of human intervention on matter (nucleus instead of electron) was reciprocated by an exponential (literally: compare the following exponents) increase in destructiveness: to give an example, while an hand grenade (TNT) triggers a kinetic energy equal to $2x10^6$ Joule, the Hiroshima bomb (which was a fission bomb) released about $52x10^{12}$ Joule, and existing U.S. ICBMs equipped with fusion bombs can emanate up to $1x10^{15}$ Joule. See Cleveland, *Concise Encyclopedia*, cit., at 304.

[33] All quotes refer to titles of scripts dedicated to nuclear weapons and nuclear warfare. See Brodie, *The Absolute Weapon: Atomic Power and World Order*, San Diego, 1972; Kaplan, *The Wizards of Armageddon*, Stanford, 1991; Powaski, *March To Armageddon*, Oxford, 1989; York, *Race to Oblivion: A Participant's View of the Arms Race*, New York, 1970.

[34] Nuclear weapons were indeed the perfect weapon in an era dominated by the doctrine of Mutual Assured Destruction (or, as the telling acronym goes, MAD): ICBMs carrying nuclear warheads offered then an unique combination of long-range employability and massive lethality, but ended up being used as mere deterrent instruments. On this point, see Jordan et al., *Understanding Modern Warfare*, Cambridge, 2016, 405 ff. (explaining historical bases and dynamics of deterrence with a focus on platforms designed to carry nuclear weapons but intended to avoid their use, instead of incentivize it – for the first time in history).

[35] Importantly the International Court of Justice (ICJ) ruled that the use of nuclear weapons must be compatible with the principles and rules of IHL. Yet its specific application of those rules to nuclear weapons was much more controversial. In a split 7 to 7 decision, with the President casting the deciding vote, the Court concluded 'that the threat or use of nuclear weapons would generally be contrary to the rules of international law applicable in armed conflict, and in particular the principles and rules of humanitarian law […]', but that it could not 'conclude definitively whether the threat or use of nuclear weapons would be lawful or unlawful in an extreme circumstance of self-defence, in which the very survival of a State would be at stake. See ICJ, *Legality of the Threat or Use of Nuclear Weapons*, Advisory

Looking now at more contemporary developments, it is a fact that our age has entered an era of *cyber-powered* force. While the shift from muscle- to chemical- and eventually nuclear-powered force is emblematic of the increasing quest for a better and faster overcoming of the enemy, today remoteness weighs more than ever before. At the turning of the XXI century two new weapons emerged: unmanned vehicles and cyber weapons.

As for the first – commonly known as 'drones' –, they can be defined as crafts that do not carry a human operator (hence the term 'unmanned').[36] The first unmanned aerial vehicle (UAV) to be employed in the military was the Predator, designed for Intelligence, Surveillance and Reconnaissance (ISR) operations during an hostile situation. Used in the Balkans war and then in the Afghanistan campaign after 9/11, they were eventually armed by mounting laser-guided Hellfire missiles on the wings. That moment has been perceived as a 'turning point in the development of military technology'.[37] As of today, this class of uninhabited weapons has considerably evolved, and the species that populate some Western Powers' arsenal are varied and perfectly adapted to the environment in which they

Opinion, 8 July 1996, Rep. 226, § 105 (2E). Recently, the international community has taken a step forward by adopting the famous *Treaty On The Prohibition Of Nuclear Weapons*, available at: https://ihl-databases.icrc.org/ihl/full/TPNW.

[36] See Singer, *Wired For War*, London, 2009, at 60 (tracing the origins of drones back to the 'intolerance for human casualties' that was increasing especially in the US during the '90s, where the relatively costless victory in the Gulf War and the Black Hawk Down disaster had pushed public opinion to deny support for sending ground troops during the genocides in the Balkans and Rwanda). On drones, see also Chamayou, *Théorie du drone*, Paris, 2013, particularly at 179 ff. (arguing that Slogans such as 'no body bags' or 'no boots on the ground' became extremely popular when NATO's intervention in Kosovo in 1999 was about to take place).

[37] See Chapa, *Remotely Piloted Aircraft, Risk, and Killing as Sacrifice: The Cost of Remote Warfare*, 16 Journal of Military Ethics No. 3-4 (2017), 256-271, at 257.

operate, be it air[38], sea[39] or land.[40] Unmanned vehicles show two main features. *First*, they do not contemplate a human 'on board': their operator is placed in a given environment from which it maneuvers the craft, while the latter operates in another environment.[41] *Second*, physical distance is matched with unprecedented closeness to the battlefield and what occurs there. This is possible thanks to a plethora of infrared and high-resolution video cameras, as well as electromagnetic, gamma ray, biological and even chemical sensors. Data are then gathered and processed via algorithms that

[38] To catch a glimpse of the number and the features of UAVs developed by the US, see Singer, *Wired for War*, cit., at 34 ff.. It is beyond the reach of this Section to provide for a complete and accurate examination of the potential of today's UAV technology. In addition to the Predator – which is scheduled to retirement in 2018, according to the DoD (see https://www.defense.gov/News/Article/Article/1095612/air-force-to-retire-mq-1-predator-drone-transition-to-mq-9-reaper,), other existing UAVs are: to name a few, the Global Hawk (bigger and endowed with increased autonomous functions, such as during takeoff and landing) and the Raven.

[39] An example is the Remote Environmental Monitoring Unit (as known as REMUS), employed by the US in Iraq for the clearing of waterways of mines or other explosives; see Singer, *Wired for War*, cit., at 37-38. See also the comprehensive Report *U.S. Navy Employment Options for Unmanned Surface Vehicles (USVs)*, elaborated by the National Defense Research Institute in 2013, which explores the state of the art of existing technology and its possible development; the Report is fully available at http://www.rand.org/content/dam/rand/pubs/research_reports/RR300/RR384/RAND_RR384.pdf.

[40] The first and more rudimentary piloted vehicle was PackBot, realized in 1998 and successfully employed in Iraq as a mine detector; it was followed by the Talon (which resembles a small tank) and the Special Weapons Observation Reconnaissance Detection System (SWORDS), 'the first armed robot designed to roam the battlefield' (see Singer, *Wired for War*, cit., at 30) and finally the Multi-Function Agile Remote-Controlled Robot (MARCBOT), which by virtue of its small size is the perfect platform to scout out the enemy position in hostile environments and search for explosives hidden in sites that are difficult to reach for a human operator.

[41] See *amplius* Chamayou, *Théorie du drone*, cit., at 37: in a pitch-perfect analogy with explorations at high seabed, the first environment is the *safe* one, whereas the second is the *hostile* one: the remote-control technique assures at the same time the power to intervene in the hostile zone, without exposing the operators to the risks that can occur in the area of such intervention. Distancing takes here the contour of a radical separation of humans from the battlefield, resulting in a pure, 'ontological' asymmetry of the confronting sides (assuming that only one disposes of unmanned vehicles, naturally): belligerents using unmanned vehicles cannot be targeted by their enemies, they are by definition removed from the battlefield.

allow for facial recognition and biometrical identification.[42] In short, the human operator is *at the same time* physically distant from what he/she is observing (unlike an aircraft pilot) and mentally close to it.[43]

As per cyber weapons, they can be defined as 'computer code[s] that [are] used, or designed to be used, with the aim of threatening or causing physical, functional, or mental harm to structures, systems, or living beings'.[44] Legal scholarship on this new kind of weapon – and the implications thereof on traditional concepts such as the notion of 'attack' – has been largely developing to date;[45] the fact that cyber weapons can cause devastating harm is widely acknowledged as well.[46] Through the lenses of remoteness, it is argued that this concept is declined not only as physical distance operator/target, but also as strategic *anonymity*.[47]

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[42] See Rosén, *Extremely Stealthy and Incredibly Close: Drones, Control, and Legal Responsibility*, DIIS Working Paper 2013:04, available at http://pure.diis.dk/ws/files/40139/WP2013_04_frro_Extremely_Stealthy.pdf.

[43] Two are the main consequences of this operational scenario: on the one hand, the danger exists that a 'PlayStation mentality' spreads among drone operators (see *Report of the United Nations Special Rapporteur on extrajudicial, summary or arbitrary executions*, Philip Alston, A/HRC/14/24/Add.6, 28 May 2010, § 84); on the other hand, several cases have been reported of drone operators suffering from post-traumatic stress disorder as a result of maneuvering unmanned vehicles (see Chappelle et al., *Symptoms of Psychological Distress and Post-Traumatic Stress Disorder in United States Air Force "Drone" Operators*, 179 Military Medicine, 2014, 63-70).

[44] See Rid-McBurney, *Cyber Weapons*, 157 The RUSI Journal No. 1 (2012), 6-13, at 7.

[45] See *ex plurimis* Roscini, *Cyber Operations and the Use of Force in International Law*, Oxford, 2014. See also Iasiello, *Are Cyber Weapons Effective Military Tools?*, 7 Military and Strategic Affairs No. 1 (2015), 23-40 (arguing that cyber weapons would be more effective options during peacetime and in particular national state tension before the start of hostilities).

[46] In the words of Boothby, "[i]f movement, and thus maneuver, characterized many of the twentieth century's developments in the conduct of warfare, information and its manipulation seem destined to be the features critical to success in the contests of the twenty-first century … cyberspace will … become the environment in which adversaries employing some degree of operational sophistication will seek to gain and to maintain military advantage by leveraging their own hostile activities while impeding the enemy's capacity to organize and operate"; see Boothby, *Deception in the Modern, Cyber Battlespace*, in Ohlin-Govern-Finkelstein, *Cyber War: Law and Ethics for Virtual Conflicts*, Oxford, 2015, at 195-212. See also Schmitt, *Computer Network Attack: The Normative Software*, 4 Yearbook of International Humanitarian Law, 2001, at 53-85 ('today the computer is no less a weapon than an F-16 armed with precision weapons').

[47] See Brenner, *'At Light Speed': Attribution and Response to Cybercrime/Terrorism/Warfare*, 97 Journal of Criminal Law and Criminology No. 2 (2007), 379-435, in particular at 411 ff.

In line with the evolutionary trend in warfare we sketched, an appropriate expression to define the next step modern armaments are taking is *A.I.-powered* force, A.I. standing for Artificial Intelligence. The hypothesis presented in this work is that the footprint of a walking robot-soldier can be considered the result of long, millennial evolutionary patterns, its main features being clearly detectable in previous armaments; but A.I.-powered force takes some to their extremes.

The advent of such robots is often described as a 'revolution in military affairs'. In fact the use of terms such as 'revolution', 'revolutionary' and similar, while undoubtedly of great impact, is partly correct and partly misleading. On the one hand, the advancement brought about by robots is to be read in conjunction with all previous changes that occurred in the conduct of hostilities; a rhetoric fueled only by pure discontinuity risk obfuscating the existence of the abovementioned evolutionary patterns. In this sense, what this new technology accomplishes is an advanced, extreme form of remoteness that humans have always sought in war, either indirectly or directly: as the traditional Latin expression goes, *nihil sub sole novi*. On the other hand, as the gamble of such technology lies in the feasibility of autonomous decision-makers, the scenario begins to take shape in which lethal decisions will not be taken by humans but instead by man-made machines. This is indeed an unprecedented shift in the history of warfare that would deserve an appropriate label: in a radical way, to rephrase the expression employed above, a *sol novus*.

This Chapter is structured as follows. *First*, the notion of 'autonomy' will be clarified when applied to non-human decision-makers: after sketching moral definitions of 'autonomy' when applied to human agents, the focus will be turned to the current literature on LAWS, with a view to showing that two apparently diverging notions of 'autonomy' (static vs. dynamic) are employed (1.2). A more technology-focused reflection will

(dealing with anonymity as a radically innovative factor in war, since it puts at stake the traditional traceability of the point of attack origin).

follow which explores current (1.3) and future (1.4) uses of autonomy; such an overview is intended to offer a general understanding of the complex applications that 'autonomy' can have. As the present work's focus in mainly on the legal consequences of autonomous decision-making resulting in the application of force against individuals – thus *kinetic* force –, the issue of 'cyber' autonomous weapons will not be touched. The implications of such technology on the law regulating the use of force – namely when it comes to *jus ad bellum* – is however far from negligible; a separate analysis is the best way to address the topic.[48] All this will allow for better delimiting the object of our analysis, which will focus on the process that LAWS are likely to employ in order to select and engage their targets: we will refer to it as 'Algorithmic Target Construction' (ATC) and attempt to frame it drawing largely from the current practice of 'signature strikes' operated through armed drones (1.5).

1.2 Notion(s)

1.2.1 Preliminary Remarks: What Autonomy is Not

'Autonomy' is a concept equally intuitive to grasp and tricky to define. It derives from the Greek *autos* (i.e. self) and *nomos* (i.e. law), and so describes the human characteristic of being able to give oneself their own law. The notion of autonomy has been developed in numerous field: for example, in theology it is described as 'the right and freedom of self-determination as contrasted with determination by somebody or something else

[48] For more on the use of autonomous technology in the cyberspace, see UNIDIR, *The Weaponization of Increasingly Autonomous Technologies: Autonomous Weapon Systems and Cyber Operations*, 7 UNIDIR Resources (2017), available at: http://www.unidir.org/publications. For a critical appraisal of States' and NGOs' attention on LAWS, while basically ignoring the issue of cyber AWS, see Anderson, *Why the Hurry to Regulate Autonomous Weapon Systems – But Not Cyber-Weapons?*, 30 Temple International and Comparative Law Journal No. 1 (2016), 17-41.

(heteronomy)'.[49] In philosophy, Kant defended the concept of moral autonomy as the ability to retain full authority over one's action, thus being capable of self-governing (opposed to being obedient to an externally imposed morality – once again, heteronomy).[50]

When applied to non-human beings – such as machines – the notion of autonomy is usually reshaped as follows. *First*, its opposite (i.e. heteronomy) is understood as a relationship of dependence between machines and humans: brief, the more a machine is dependent on a human being when performing its tasks, the less it can be described as autonomous. Inter-machine independence is not relevant in terms of autonomy. *Second*, literature tends to adopt a narrow definition of autonomy, deliberately ignoring its moral implications. For humans to be autonomous it is essential that they can act in accordance with moral principles: human beings 'can make things happen intentionally and for reasons'.[51] Conversely, the notions of 'will', 'intention' and 'moral agency' become of little to no utility when discussing autonomy with respect to machines. It has been argued that there is no interest within the military in building 'an ethically-infallible machine'; rather – and less pretentiously – 'a machine that *performs better than* humans do on the battlefield'.[52]

Such *functionalist* approach employs a notion of autonomy that focuses exclusively on performance (i.e. carrying out a given task optimally), not on the ethical backgrounds of an action. It follows that a machine is autonomous not when it takes moral judgments on its own (i.e. without relying on external moral influence), but *simpliciter* when it performs an action in the real world without external intervention.

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[49] See 'Autonomy', in Richardson-Bowden (eds.), *The Westminster Dictionary of Christian Theology*, Westminster, 1983, at 60.

[50] Hill, *Kantian autonomy and contemporary ideas of autonomy*, in Sensen, *Kant On Moral Autonomy*, Cambridge, 2012, 15-31, in particular 16-21 (describing the notion of morality that Kant defends in his moral theory contained in the *Groundwork for the Metaphysics of Morals*).

[51] *Ibidem*, at 18.

[52] Lin-Bekey-Abney, *Autonomous Military Robotics: Risk, Ethics and Design*, Report for the US Department of Navy, Office of Naval Research, 2008, at 2.

Machine's autonomy as such is morally neutral, as decisions are not the result of a moral judgment.

As regards the type of functions performed, the decision-making process that takes place in operations contemplating the use of force (first and foremost military operations) is commonly distilled into the so-called 'OODA Loop'.[53] According to this model, originally developed by John Boyd in an attempt to justify American superiority over Koreans during the Korean war, a human soldier first 'Observes' the surrounding environment gathering as more data as possible through human senses; he then 'Orients' himself (or his vehicle) towards the adversary, 'Decides' which course of action is best suitable for reaching the goal and eventually 'Acts' (i.e. executes the decision). Hence LAWS must be capable of performing some or all these steps without relying on human intervention.

On this premise, the following definition of *autonomy* has been proposed: 'the capacity to *operate* in the real-world environment without any form of external control, once the machine is activated and at least in some areas of operation, for extended periods of time'.[54] Autonomy is therefore conceived as the machine's capability of (*i*) organizing data previously gathered via sensors and (*ii*) performing an action in accordance with those data, (*iii*) without relying on a human operator.

Similarly, in a telling comparison with biological systems, it has been emphasized that capability of operating in the real world independently of human control and adaptability to changing environment is an important feature of living organisms that, to some extent and depending on the

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[53] For a deeper insight into Boyd's thought and the military strategy he inspired with his reflections, see Osinga, *Science, Strategy and War. The Strategic Theory of John Boyd*, Abingdon, 2007. A fitting paraphrase is provided by Adams: 'victory does not always go the [sic] commander with the best observation. It goes to the one that can best process observation into data, data into information, information into orders, and then orders into action'; see Adams, *Future Warfare and the Decline of Human Decisionmaking*, 31 Parameters No. 4 (2001-2002), 57-71, at 5. Applied to machines, the entire process takes place within the system and may depend on human contribution.

[54] Lin-Bekey-Abney, *Autonomous Military Robotics*, cit., at 105 (*italics mine*). Taking one step back, the authors define a 'robot' as 'a powered machine that (1) senses, (2) thinks (in a deliberative, non-mechanical sense), and (3) acts (*ibidem*, at 100);

current status of technology, can be replicated in robotics.[55] However, no matter of far autonomy pushes machines in the field of performing more complex tasks, *human presence* will always be part of the equation. Every robot structurally embodies a control architecture (at a software level) that allows a human operator to supervise, control and eventually deactivate the machine.[56]

This is a key element for the purposes of our analysis. Such circumstance – the inescapability of some form of human presence, at least at the very beginning (the act of programming a machine) and in performing (some) tasks – leads to a trivial, yet meaningful, conclusion: *autonomy is but a sophisticated camouflage for heteronomy*. It is up to humans to confer machines autonomy: metaphorically, it is for humans to 'draw the line' – and decide *how much* the machine can perform without them. This means that humans *must* abstain from delegating too much power (such as in life-and-death decisions) to LAWS if a *legal* obligation so requires. We will turn to this point in Chapter IV.

1.2.2 Autonomy as a 'Static' Concept

According to many, there is a clear divide between what can be defined as autonomy and what cannot: in this sense, autonomy is seen as a *static* notion, monolithic, showing discrete boundaries.

In 2011, the ICRC raised a general definition of autonomy in its Report dedicated to IHL and challenges in contemporary armed conflicts.[57] In defining '*autonomous* weapons systems', the ICRC stated that such a

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[55] See Bekey, *Autonomous Robots. From Biological Inspiration to Implementation and Control*, Cambridge-London, 2005, at 1-2 (arguing that it is expectable that 'robots [will] … exhibit increasing levels of autonomy and intelligence in the near feature', in a way that is going to be increasingly comparable to living species).

[56] *Ibidem*, at 3 ff..

[57] See ICRC, *International Humanitarian Law and the challenges of contemporary armed conflicts*, Official working document of the 31st International Conference of the Red Cross and Red Crescent (28 November/1 December 2011), available at http://www.icrc.org/eng/assets/files/redcross-crescent-movement/31st-international-conference/31-int-conference-ihl-challenges-report-11-5-1-2-en.pdf.

weapon system is 'one that can learn or adapt its functioning in response to changing circumstances in the environment in which it is deployed'.[58] By contrast, an '*automated* weapon or weapons systems' is 'one that is able to function in a self-contained and independent manner although its employment may initially deployed or directed by a human operator'.[59] The ICRC takes the example of a sentry gun that opens fire upon voice verification of a potential intruder. A sensor gathers the relevant data (i.e. voice), the computational program elaborates them (i.e. matching it with registered voices) and eventually actuators perform the consequent action (i.e. firing or enabling the subject to access). It follows that the notion of autonomy, as opposed to that of automation, lies in the *magnitude of human presence* at the source of a machine's decision: only if this is allowed to take its decision in a – so to speak – emancipated way, that machine is autonomous.

Several official military documents have been issued so far regarding definitions of LAWS.[60] Probably the first in chronological order is U.S. Department of Defense's Directive No. 3000.09, released on November 21, 2012.[61] Its purpose was to adopt an official policy regarding such new technology, assigning responsibility for the development and use of this

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[58] *Ibidem*, at 39.

[59] *Ibidem*.

[60] See, for instance, the 2011 Joint Doctrine Note 2/11, *The UK Approach to Unmanned Aircraft Systems*, available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/33711/20110505JDN_211_UAS_v2U.pdf, at 2-3 (defining autonomous systems as 'capable of understanding higher-level intent and direction. From this understanding, as well as a sophisticated perception of its environment, such a system is able to take appropriate action to bring about a desired state. It is capable of deciding on a course of action from among a number of alternatives, without depending on human oversight and control, although these may still be present. Although the overall activity of an autonomous system will be predictable, individual actions may not be'). As far as the UK is concerned, the House of Lords' Selected Committee on Artificial Intelligence has contrasted such definition and officially requested the Government to align with other States' current definition of LAWS; see House of Lords, Selection Committee on Artificial Intelligence, *AI in the UK: ready, willing and able?*, published 16 April 2018, particularly at §§ 364, 365, available at: https://publications.parliament.uk/pa/ld201719/ldselect/ldai/100/100.pdf.

[61] Hereinafter *DoD Directive 3000.09*, available at http://www.dtic.mil/whs/directives/corres/pdf/300009p.pdf.

class of weapons and designing guidelines to minimize negative consequence associated with their employment.[62] The Directive provides several definitions, from which it is possible to infer the following.[63] Autonomy and automation (here referred to as 'semi-autonomous') are clearly distinguished, which confirms the static approach that has been sketched before. As an example of semi-autonomous weapon systems, the Directive cites 'fire and forget' missiles as well as whatever weapon system that, albeit performing some tasks (e.g. tracking and identifying potential targets) without human intervention, still needs 'human control […] over the decision to select individual targets and specific target groups for engagement'.[64]

The UN Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns, dedicated his 2013 Report (hereinafter also Report Heyns) to LAWS and their compatibility with IHRL.[65] LAWS are described as 'robotic weapon systems that, once activated, can select and engage targets without further intervention by a human operator. The

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[62] *Ibidem*, § 1.

[63] First, *autonomous* weapon system are defined as '[a] weapon system that, once activated, can select and engage targets without further intervention by a human operator. This includes human-supervised autonomous weapon systems that are designed to allow human operators to override operation of the weapon system, but can select and engage targets without further human input after activation' (*ibidem*, at 13-14); second, *human-supervised* autonomous weapon system are defined as '[a]n autonomous weapon system that is designed to provide human operators with the ability to intervene and terminate engagements, including in the event of a weapon system failure, before unacceptable levels of damage occur' (*ibidem*, at 14); third, *semi-autonomous* weapon system: '[a] weapon system that, once activated, is intended to only engage individual targets or specific target groups that have been selected by a human operator' (*ibidem*).

[64] *Ibidem*. The divide between autonomous weapons and human-supervised weapons seems more problematic instead: it is specified that the second allows for a human veto on the decision to engage the target, so by process of elimination the first encompasses weapon systems that do not contemplate any human intervention on such decisions. Such divergent degrees of human dependence are included in one single notion of autonomy, which as a result ends up being understandably unclear.

[65] *Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns*, UN General Assembly, A/HRC/23/47 (9 April 2013), available at http://www.ohchr.org/Documents/HRBodies/HRCouncil/RegularSession/Session23/A-HRC-23-47_en.pdf. Report Heyns refers to 'Lethal Autonomous Robots (LARs)', while we continue to adopt the acronym LAWS.

important element is that the robot has an autonomous 'choice' regarding selection of a target and the use of lethal force'.[66] This definition, in which the concept of automation as opposed to autonomy remains implicit, attaches greater importance to the specific *function* performed by the machine (namely, target selection and engagement).

The degree of human intervention in the machine's decision-making process has inspired a *tripartite* definition which is having an immense fortune today. In 2012 Human Rights Watch (HRW) and Harvard Law School's International Human Rights Clinic (IHRC) published a groundbreaking Report,[67] which distinguishes among: (*a*) human-in-the-loop weapons;[68] (*b*) human-on-the-loop weapons;[69] (*c*) human-out-of-the-loop weapons.[70] This distinction is remarkable for two reasons. *First*, the loop these definitions refer to is a sort of 'short loop', being it limited to the sole decision-making process that culminates in the use of force against the selected target: it therefore fits perfectly into the object of our analysis. *Second*, this three-layer definition captures the intensity of human presence with regard to some *functions* (as in the Report Heyns) that are of greater interest.

According to a different understanding of autonomy, this concept can be based on three critical 'dimensions':[71] (*i*) the human-machine command-and-control relationship, (*ii*) the complexity of the system and (*iii*) the type of decision being automated.[72] As for the *first*, each layer of

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[66] *Ibidem*, § 38.

[67] HRW-IHRC, *Losing Humanity: The Case Against Killer Robots*, 2012, available at: http://www.hrw.org/sites/default/files/reports/arms1112_ForUpload.pdf.

[68] *Ibidem*, at 2: 'robots that can select targets and deliver force only with a human command'.

[69] *Ibidem*: 'robots that can select targets and deliver force under the oversight of a human operator who can override the robots' actions'.

[70] *Ibidem*: 'robots that are capable of selecting targets and delivering force without any human input or interaction'.

[71] Scharre, *Robotics on the Battlefield. Part I: Range, Persistence and Daring*, Report for the Center for a New American Security (May 21, 2014), available at https://www.cnas.org/publications/reports/robotics-on-the-battlefield-part-i-range-persistence-and-daring.

[72] *Ibidem*, at 13.

Human Rights Watch's definition is paired with the three adopted by *Directive 3000.09*: in doing so, 'semi-autonomous weapon systems' correspond to 'human-in-the-loop weapons';[73] 'human-supervised autonomous weapons' to 'human-on-the-loop weapons';[74] finally 'fully autonomous weapons' to 'human-out-of-the-loop'.[75] At the core of the *second* aspect is the complexity of a machine's responses to environmental input. Perhaps more important is the *third* aspect, which expressly underscores the inherent function-relative nature of autonomy. It is argued that to speak about autonomy without considering the specific functions of a machine is at best pointless. A landmine and a toaster both exercise some functions without human intervention (i.e. exploding upon physical contact and toasting a slice of bread), *ergo* autonomously, but in fact raise quite discrete concerns as resulting from the functions performed.

The ICRC, in a 2014 Report expressly dedicated to autonomous weapons systems, went back on the issue of definition.[76] On the one hand, the Report focuses on autonomy with respect to the sole '*critical functions*' that a weapon system may perform – namely 'acquiring, tracking, selecting and attacking targets'.[77] On the other hand, it points out that automation and autonomy tend to overlap in fact, and it is therefore difficult to keep them separated, if a criterion such as the complexity of the machine is not clarified.[78] As a matter of fact, both 'autonomous' and 'automated' weapons

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[73] Described as '[m]achines that perform a function for some period of time, then stop and wait for human input before continuing'; *ibidem*.

[74] 'Machines that can perform a function entirely on their own but have a human in a monitoring role, with the ability to intervene if the machine fails or malfunctions', *ibidem*.

[75] 'Machines that can perform a function entirely on their own and humans are unable to intervene', *ibidem*. Regarding this last definition, it is to be underlined that the adjective 'fully' is absent in the DoD Directive 3000.09; however, it is would not be incorrect to add it for better clarifying in which sense this class of weapons is different from the previous.

[76] ICRC, *Autonomous Weapons Systems. Technical, Military, Legal and Humanitarian Aspects*, Expert Meeting (March 26-28, 2014), available at https://www.icrc.org/en/publication/expert-meeting-autonomous-weapon-systems-technical-military-legal-and-humanitarian-0.

[77] *Ibidem*, at 62.

[78] See for instance Scharre, *Robotics on the Battlefield. Part I*, cit., at 13 (when discussing complexity of a machine as a criterion to define 'autonomy').

systems may select and engage their target with no human intervention; the real shift lies in the' bounds of their human-determined programming',[79] i.e. in the degree of 'freedom of choice' that the machine enjoys.[80]

Such approach is convincing, it suggests that what is source of concern in the debate around machine's autonomy is the degree of independence in a concrete, *specific* choice of action that the system is allowed to take. A more pondered understanding of autonomy – in opposition to the 'all-or-nothing' approach which seems preponderant in the current discussion – is therefore preferable.

1.2.3 Autonomy as a 'Dynamic' Concept

Another approach to 'autonomy' is to consider it not as a 'monolith', but rather as a concept capable of taking different shapes depending on the functions it is called to perform. Understood as a mere counterpart of human control, without further clarification, autonomy may lead to an oversimplification of the issue.

Taking into account the relationship with human presence, it has been stressed that autonomy has a *quid pluris* than simple human independence: it includes it but does not coincide with it.[81] Developing this

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[79] See ICRC, *Autonomous Weapons Systems*, cit., at 64.

[80] Once again, the expression 'freedom of choice', albeit sounding appropriate in a context where autonomy is discussed, inevitably turns out to be deceptive when applied to machines: as explained *supra*, it is always up to human agents to attribute 'autonomy' to machines.

[81] For an account of autonomy in a different field, see Clark-Kok-Lacroix, *Mind and autonomy in engineered biosystems*, 12 Engineering Applications of Artificial Intelligence No. 3 (1999), 389-399. The Authors define autonomy as 'independence of comportment' emerging when a machine possesses, to a variable degree, the following characteristics: (*i*) *automation* (which is described as the ability to operate without outside intervention); (*ii*) *volition* (i.e. choice in action or thought, which involves the ability to formulate and execute strategies to attain self-defined goals); and (*iii*) *intention* in pursuing the goals – which renders the machine capable of exercising deliberate self-control. It is impossible not to spot a shift in the use of terms: what was before described as autonomy in contrast with automation (i.e. the degree of human intervention) is now – maybe confusingly – being degraded to automation. Yet, such complication is more apparent than factual: recalling the metaphor of the chain, every autonomous system is by definition tethered to human control to some extent. Having defined this as automation, it follows that every

line of thought, a multi-faceted approach to defining autonomy has been adopted which focuses on 'common sets of traits' which apply across types of machine systems.[82] Such common sets are: (*a*) frequency of operator interaction (*automation*); (*b*) tolerance for environmental uncertainty (*adaptability*); (*c*) level of assertiveness or ability to change an operative plan to better accomplish the assigned mission without a specific intervention by the operator (*discretion*).[83] Changing a defined plan (flexible) in order to achieve a defined goal (rigid) can be described as a form of creativity.[84]

With respect to the opposition autonomous/automated, assuming that the abovementioned sets of traits may vary in scale, some have inferred that drawing a bright line between automation and autonomy is impossible; rather, the latter should be seen as a continuum or – as has been proposed – a *spectrum*.[85] Amongst many, Sheridan has proposed what has been recognized as the 'best known scale'[86] for measuring autonomy: his 10-level model is accompanied by strict criteria against which the autonomy of a given system can be objectively evaluated.[87] Level 1 corresponds to automation, while Level 10 indicates full autonomy; between the two extremes, the system is endowed with crescent autonomous functionalities.[88] In between, the system 'offers a complete set of actions (2), 'narrows the selection down to a few' (3), or 'suggests one' (4) and 'executes that suggestion if the human approves' (5), 'allows the human a restricted

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autonomous system is necessarily automated; what renders a system truly autonomous must be something beyond.

[82] Marra-McNeil, *Understanding "the loop": Regulating the next generation of war machines*, 36 Harvard Journal of Law and Public Policy No. 3 (2013), 1139-1185.

[83] *Ibidem*, 1148 ff..

[84] In the words of Clark-Kok-Lacroix, *Mind and autonomy*, cit., at 390: '[a]lthough absolute creativity is an unattainable goal, any entity with some degree of autonomy must be creative enough to formulate at least a few of its own goals and behavioral guidelines'.

[85] See Clark-Kok-Lacroix, *Mind and autonomy*, cit., *passim*.

[86] This is the opinion of Coppin-Legras, *Autonomy Spectrum and Performance Perception Issues in Swarm Supervisory Control*, 100 Proceedings of the IEEE No. 3 (2012), 590-603, at 592.

[87] See Marra-McNeil, *Understanding "the loop"*, cit., *passim*.

[88] As described in Parasumaran-Sheridan-Wickens, *A Model for Types and Levels of Human Interaction with Automation*, 30 IEEE Transactions On Systems, Man, And Cybernetics Part A Systems And Humans No. 3 (2000), 286-297, at 287.

time to veto before automatic execution' (6), 'executes automatically, then necessarily informs the human' (7), 'informs the human after execution only if the human asks' (8), or 'informs the human after execution if it, the computer, decides to do so' (9).[89] Similarly, the US Air Force Research Lab (AFRL) has proposed its 11-Level autonomy spectrum (more focused on human dependence at the decision and action stages of the OODA loop).[90]

Spectrums are useful for classifying both existing and future weapons: for instance, the Nazi land torpedo *Goliath*, a remote-controlled vehicle carrying explosive to be driven into enemy tanks, does not exceed Level 0 of Sheridan's scale, by reason of its inherent dependence on human-machine interaction, lack of environmental awareness and discretion.[91] Analogously, the famous *Tomahawk* missile must have its target set before its launch, in addition to being unable to dynamically react and adapt to environmental uncertainty,[92] thus placing at no more than Level 1 of AFRL's spectrum.[93] Recent unmanned aerial vehicles (such as the *Predator*, the *Reaper* and the *Global Hawk*), as well as ground vehicles (such as the *Packbot* and the SWORDS) and maritime vehicles (such as the *Aegis* sea defense

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[89] *Ibidem*.

[90] See Sholes, *Evolution of a UAV Autonomy Classification Taxonomy*, Remarks at the 2007 IEEE Aerospace Conference, at 1, available at http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=4161585. AFRL's Levels of Autonomy are the following: Remotely piloted vehicle (1); Execute pre-planned mission remotely (2); Changeable mission (3); Robust response to real time faults/events (4) Fault/event adaptive vehicle (5); Real time multi-vehicle coordination (6); Real time multi-vehicle cooperation (7); Battlespace knowledge (8); Battlespace single cognizance (9); Battlespace swarm cognizance (10); Fully Autonomous (11).
A thorough comparison between Sheridan's model and the Air Force's model is carried out by Marra-McNeil, *Understanding "the loop"*, cit., 1163-1164 (arguing that the latter accurately shows that a given system may 'mix and match' autonomy and automation with regard to different stages).

[91] See Singer, *Wired for War*, cit., at 49.

[92] *Ibidem*, at 58.

[93] Level 1 indicates that a machine 'execute[s] pre-planned mission remotely', without being able to modify such missions (which is the degree of autonomy attained at Level 2); see Sholes, *Evolution of a UAV Autonomy Classification Taxonomy*, cit., at 3.

system) although technically apt to autonomous functioning, are currently operated at the lower ends of the spectrum.[94]

1.2.4 An Interim *Conclusion: a Working Definition of Autonomy*

Taking stock so far, the core idea of machine's autonomy is reduction to absence of human intervention in performing certain tasks. Following the dynamic approach explained above, autonomy should be understood as a spectrum, whose function is to measure the degree of *operational independence*. The other two indexes (tolerance for environmental uncertainty and assertiveness) that have been proposed are helpful to capture how autonomous machines function; for what is of interest here, however, emphasis must be placed on the first element. In particular, it is of paramount importance that the *specific* functions of the machine are taken into account.

What opens up entirely new scenarios are: (*a*) the possibility that a machine takes its own decisions without consulting or reporting a human operator (i.e. from Level 7 on in Sheridan' scale); (*b*) the possibility that the single action taken autonomously is a critical one: for instance, selecting and engaging a target, even a *human* target. This would mean anything less than conferring a machine the power to decide on life and death of humans. It follows that it is not autonomy *per se* to raise concerns, but rather autonomy when associated to critical functions of a weapon system.

Our understanding of autonomy is therefore centered in the degree of human intervention when LAWS perform critical functions. Before turning to LAWS, however, it seems appropriate to focus on the reasons why autonomy is a key technological driver for the use of force.

1.3 Today's Autonomy

[94] For an in-depth discussion of the features of each vehicle, see Marra-McNeil, *Understanding the "Loop"*, cit., at 1178-1185. Each one will be however made object of more specific analysis in the following section.

1.3.1 The Vital Importance of Autonomy for the Military

In June 2016, the U.S. Defense Science Board (DSB)[95] published a Report illustrating the current status of the art, existing challenges and future developments of the operational use of autonomy across all warfighting domains.[96] The Report basically unveils the reasons why autonomy 'has attained a "tipping point" in value' for the military.[97]

Three are the main factors. *First*, autonomous weapons reduce undesired casualties and allow for adopting of riskier tactics.[98] *Second*, it ensures rapid collection and elaboration of data, as well as enhanced quality of data links (communication between systems), even in critical situation (so-called contested environments).[99] *Third*, decision speed is undeniably improved when certain systems operate autonomously.[100] A key benefit is that autonomous capabilities allow for acting inside an enemy's operation cycle, disrupting communication links and denying operational abilities.[101] This is the case during cyber operations and in the field of missile defense, where the operational tempo is particularly strict.

The DSB's attitude towards increasing autonomous capabilities in the military is evidently a positive one: as autonomy will grant the U.S. a

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[95] The Board is a Federal Advisory Committee established within the US Department of Defense tasked with providing independent advice to the Secretary of Defense.

[96] US DSB, *Summer Study on Autonomy*, 2016, available at: https://www.hsdl.org/?abstract&did=794641.

[97] *Ibidem*, at 98 ('Summary').

[98] *Ibidem*, at 11 ('Military value and current DoD uses').

[99] *Ibidem*, at 12.

[100] Speed and agility are the new dimensions of warfare, in which weapon systems will be able to engage and respond at the speed of light, thus reversing the traditional tempo of battlefield operation. Albeit of extreme interest, the issue cannot be discussed here. As Adams put it, 'Army After Next (AAN) forces are expected to need both "linear speed" (speed across the ground) and "angular speed" (the ability to out-think and anticipate) in order to survive and win on future battlefields'; see Adams, *Future Warfare*, cit., at 3.

[101] It can be helpful to think at this process in terms of the OODA Loop explained above. As acknowledged by Adams, *Future Warfare*, cit., at 4: '[t]he notion of mastering this process, 'getting inside the enemy's decision loop' (i.e. execute the OODA process more quickly than the enemy) is at the heart of the digital Army and the information warfare concept'.

significant military advantage on adversaries, it is recommended that trust in autonomous systems be improved; that their adoption through DoD enterprise-wide enablers is accelerated; that the operational pull for them be strengthened by developing a greater value across a broad range of military missions.[102] Such optimistic approach is mirrored in an 'Imagine If…' box at the very opening of the Report.[103] However, in the very last sentence, the idyllic scenario is reversed when such technology is imagined mastered by U.S. adversaries.[104] Hence a powerful justification of the need for developing autonomous weaponry as soon as possible.

But it would be misleading to assume that only the U.S. – as of today first in ranking for military expenditures –[105] has taken a proactive approach to autonomous weapons. The Russian Federation has developed policy documents to set general technical and strategic guidelines for robotization in all branches of the Russian armed forces.[106] As regards China – second for military expenditure – published data are extremely scarce. However,

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[102] See US DSB, *Summer Study on Autonomy*, cit., particularly at 98. The report contains 26 recommendations addressed to relevant bodies.

[103] *Ibidem*, at 1-4. The box guides the reader in a futuristic battlespace populated by machines: each major strength of autonomy (remoteness; decision speed; infiltration; powerful data collection and analysis) is showed in turn.

[104] *Ibidem*, at 4.

[105] According to the Stockholm International Peace Research Institute (SIPRI) 2017 Fact Sheet, which contains facts and figures on 2016 and is based on current market exchange rates; see https://www.sipri.org/sites/default/files/Trends-world-military-expenditure-2016.pdf, at 2.

[106] As explained by Kozyulin, in 2015 the Russian Defense Ministry has adopted the '*Program for Development of Advanced Military Robotics up to 2025 with Forecasts until 2030*' (classified); almost simultaneously, the General Staff of the Federation adopted the '*Concept for Deployment of Robotic System for Military Use until 2030*' (classified) and by the end of the year the President of Russian Federation signed the Decree entitled '*On the National Center for Technology Development and the Basic Elements of Robotics*'. While still at early stages, Russia is seriously heading to a robotization of its military force, and although the Russian Army only disposes of remote-controlled weapons so far, these can operate partially autonomously and be converted into more advanced autonomous platforms. See Kozyulin, *Russia's automated and autonomous weapons and their consideration from a policy standpoint*, Speaker's summary in ICRC Report of the Expert Meeting on *Autonomous Weapon Systems. Implications Of Increasing Autonomy In The Critical Functions Of Weapons*, Versoix (CH), 15-16 March 2016, available at https://www.icrc.org/en/publication/4283-autonomous-weapons-systems (hereinafter ICRC 2016 Report), at 60-64.

according to the U.S., both commercial and military robotics industries have been rapidly growing in size and quality in the recent years, following a trend that has no reason to terminate in the near future (quite the contrary); namely, improvements in A.I. and nanorobotics, which have occurred thanks to escalating funding to R&D across the country, could even 'close the technological gap between U.S. and Chinese unmanned systems'.[107]

It is a fact that autonomy is currently one of the most powerful drivers for technological innovation in the field of the use of force: in the next decades – even *years* – armaments will experience an unprecedented shift towards autonomy.

1.3.2 Autonomy in Existing Weapons

Autonomous technology has been fielded for years and, as said before, there is no chance of a slowing down: as one US Army Colonel put it, 'we are building the bridge to the future while standing on it'.[108] Existing weapons systems are able to perform limited autonomous functions, among which critical functions have already been included.

A first component of autonomy in existing weapons can be found in the so-called *sensor-fused and loitering munitions*: their autonomy is limited, since they use sensors to select and engage a target (often pre-programmed) only within a designated area.[109] These munitions and missiles are often called 'fire-and-forget' due to their independence in attacking the target; human presence is however essential for its selection, which confines them at the lowest scale of Sheridan's spectrum. One example of this technology

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[107] See the Research Report prepared on behalf of the U.S.-China Economic and Security Review Commission entitled *China's Industrial and Military Robotics Development* and published on October 2016, available at https://www.uscc.gov/sites/default/files/Research/DGI_China%27s%20Industrial%20and%20Military%20Robotics%20Development.pdf, in particular its Executive Summary (9-13, and 11, where reference is made to 'autonomous operation') and, with respect to autonomous weaponry, at 56-59 (stating that there is even a 'lack of literature' on the topic, which should stimulate stronger international dialogue).

[108] Quoted in Singer, *Wired for War*, cit., at 19.

[109] See ICRC 2016 Report, cit., at 74.

is the Israel *Harpy*, an anti-radar weapon that selects and engages radar targets in accordance with pre-programmed target 'signatures'.[110] Its operator cannot know in advance which particular radars are to be engaged, because these are pinpointed by the machine only if meeting its programmed parameters:[111] there is a *general* selection of possible targets, but little to no human decision about the *specific* target. This difference is not without a distinction, as will be shown in the following.[112] The *Harpy*'s advanced version is the *Harop*: the latter can select and engage its targets at longer distance, either by remote control or autonomously.[113]

A more complex and structured systems are *missile- and rocket-defense* weapons, used for air defense of ships and ground installations against incoming threats (such as artillery, mortars, manned or unmanned aircrafts).[114] Albeit remaining well under the control of a human operator (who can override them in case of malfunctioning or unintended attack), thus placing themselves around Level 6 of Sheridan's spectrum, such weapons systems can perform critical functions without the input of the operator. Famous examples of this kind of systems are the Israeli *Iron Dome*,

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[110] See Rafael Advanced Defense Systems, HARPY NG, http://www.iai.co.il/2013/36694-16153-en/IAI.aspx.

[111] See Crootof, *The Killer Robots Are Here: Legal and Policy Implications*, 36 Cardozo Law Review (2015), 1837-1915.; see *amplius* Scharre, *Autonomy, "Killer Robots" and Human Control in the Use of Force – Part I*, Just Security, https://www.justsecurity.org/12708/autonomy-killer-robots-human-control-force-part/.

[112] See Crootof, *The Killer Robots*, cit.: the Author argues that since many existing weapons systems might be employed autonomously for offensive operations, it would be pointless to support a ban on such technology. As an example, she takes the UK Brimstone, a fire-and-forget anti-armor weapon believed to be capable of engaging not only targets identified and compared to a target signature in its memory, but also targets with 'certain characteristics' provided for by the human operator. In the second case, the Brimstone would be autonomous in the proper sense of the term; and it would be an already-existing weapon.

[113] For a brief description of *Harop*'s functions, see Bergen-Rowland, *World of Drones: The Global Proliferation of Drone Technology*, in Bergen-Rothenberg (eds.), *Drone Wars: Transforming Conflict, Law and Policy*, Cambridge, 2015, 300-344, at 301 ('[t]he Harop can circle over a target for hours before it is activated and sent to the ground a single-use missile').

[114] See ICRC 2016 Report, cit., at 72: '[s]hip-based weapons are often described as "close-in weapon systems" and the land-based weapons as "counter-rocket, artillery and mortar systems"'.

a mobile land-based counter-rocket systems that intercepts incoming missiles at impressive speed,[115] the US *Phalanx* (a ship-based gun system)[116] and *C-RAM* (a land-based version of the *Phalanx*)[117]. In particular, both *Phalanx* and *C-RAM* can be employed under the *Aegis* combat system, which disposes of four operational modes, ranging from 'semiautomatic' to 'casualty': whereas decisions on lethal force are always controlled by a human operator in the first mode, the second permits the system to exert lethal force independently.[118] Importantly for our analysis, targets always remain unmanned munitions: thus these weapons are *not* an example of LAWS.

Focusing on human presence, one may argue that all things considered it is still guaranteed, as the operator can veto the machine's decision at any time: in HRW's terminology, humans remain *on* the loop. It is debatable, however, how *meaningful* such human intervention can be:[119] consider for instance a veto power that must be exerted in less than a second. Besides, human tendency to relying on machine's decisions rather than one's own (the so-called 'automation bias') is a phenomenon which has received attention also by psychology.[120] Even if the operator had

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[115] See Rafael Advanced Defense Systems, Iron Dome Dual-Mission Counter Rocket, Artillery and Mortar (C-RAM) and Very Short Range Air Defense (V-SHORAD) System, http://www.rafael.co.il/Marketing/186-1530-en/Marketing.aspx. Iron Dome's future developments are going to cut down prices and render the system capable of intercepting unmanned systems; see https://www.strategypage.com/htmw/htada/20170727.aspx.

[116] Phalanx Close-in Weapon System; see Raytheon, Phalanx Close-In Weapon System, at http://www.raytheon.co.uk/capabilities/products/phalanx/.

[117] See http://www.navy.mil/navydata/fact_display.asp?cid=2100&tid=456&ct=2.

[118] See Stoner, *R2D2 with Attitude: The Story of the Phalanx Close-In Weapons System (CIWS)*, at http://www.navweaps.com/index_tech/tech-103.htm, and specifically Marchant et al., *International Governance of Autonomous Military Robots*, 12 Columbia Science & Technology Law Review (2011), 272-315, at 287 (describing the 'casualty' setting, which allows the system to do 'what it thinks is necessary to save the ship').

[119] See Thurnher, *No One at the Controls: Legal Implications of Fully Autonomous Targeting*, 67 Joint Force Quarterly No. 4 (2012), 77-84, at 83 (labelling such form of intervention as mere 'rubber stamps').

[120] For a comprehensive overview on automation bias and the dangers associated therewith, see Cummings, *Automation Bias in Intelligent Time Critical Decisions Support Systems*, American Institute of Aeronautics and Astronautics, 3rd Intelligent Systems Conference of Chicago, 2004, available at

sufficient time to evaluate the nature of the selected target, either to authorize or to veto its engagement,[121] human presence could prove ineffective; and this cannot but increase the more technology advances.[122]

Turning to existing technology, an important role is played by the so-called anti-personnel *sentry weapons*, stationary as well as mobile systems employed to patrol specific sites, perimeters or borders.[123] Here the most famous example is the South Korea's *aEgis I and II* and *Super aEgis I and II*, stationed at the Demilitarized Zone that separates the Republic of Korea from North Korea.[124] This rotating turret employs optical, thermal and infrared sensors to select human targets, but requires remote authorization from an operator to engage them (thus being merely remotely-piloted systems, placed at the lowest stage of the spectrum). However, it seems that the systems are already endowed with functions allowing them to exert lethal force without human intervention.[125]

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http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.91.2634&rep=rep1&type=pdf. See also UNIDIR's Report No. 9 called *Algorithmic Bias and the Weaponization of Increasingly Autonomous Technology*, 2018, available at: http://www.unidir.org/publications.

[121] For instance, Crootof, *The Killer Robots*, cit., employs this distinction to divide what 'semi-autonomous' weapons from 'autonomous' weapon systems. Considering autonomy in terms of a spectrum (Level 5-Level 6) helps avoid this kind of distinction, which in the view of the writer ends up confounding rather than clarifying notions.

[122] A telling example of how rapidity of reaction is essential in battlefield is provided by iRobot's REDOWL (Robotic Enhanced Detection Outpost with Lasers), a ground weapon system derived from a PackBot employing lasers and sound detection equipment to pinpoint hidden snipers; see Singer, *Wired for War*, cit., at 111. Equipping REDOWL with guns or other weapons to make it capable of carrying out the shooting against the sniper is quite a foreseeable (and probably auspicious) step forward, once sufficiently reliable technology is developed.

[123] See ICRC 2016 Report 2016, cit., at 73.

[124] See DoDamm Systems, aEgis I & II, Super aEgis I & II & Athena, http://www.dodaam.com/eng/sub2/menu2.php. See amplius Blain, *South Korea's Autonomous Robot Gun Turrets: Deadly from Kilometers Away*, 7 December 2010, at http://newatlas.com/korea-dodamm-super-aegis-autonomos-robot-gun-turret/17198/ (underlying that this system can 'find and lock on to a *human-sized target* in pitch darkness at a distance of up to 1.36 miles', italics added). It seems clear that existing technology is at least very close to being operated against human targets.

[125] See Parkin, *Killer robots: The soldiers that never sleep*, BBC, 16 July 2015, at http://www.bbc.com/future/story/20150715-killer-robots-the-soldiers-that-never-sleep; *Samsung Techwin SGR-A1 Sentry Guard Robot*, GLOBALSECURITY.ORG, at http://www.globalsecurity.org/military/world/rok/sgr-a1.htm.

To sum, this list, far from being exhaustive,[126] shows an unambiguous trend towards higher levels of Sheridan's spectrum. Increasing autonomy seems being developed and deployed: (*i*) not only with limited, but also with more *extended time-frame*; (*ii*) not only in constrained and predictable, but also more *complex environments*; (*iii*) not only for defensive, but also *offensive* operations; (*iv*) not only against unmanned, but also manned or *human* targets. Autonomy is about to meet lethality on an increasingly regular basis: hence why it has been said that 'killer robots are here'.[127]

1.4 Tomorrow's Autonomy

1.4.1 Increased A.I. Capabilities

A.I. is expected to have 'a major impact on the future of autonomous vehicles' and to prove 'disruptive in [its] military application'.[128] Machines endowed with advanced A.I. capabilities will allegedly have 'a similar or greater capacity to think like a human'.[129] Tomorrow's autonomy will be largely built on existing technology, which is making great strides especially as far as military targeting is concerned.[130]

Research in this field is particularly complex, as it involves theoretical cognitive science, neural networks, evolutionary computation,

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[126] A more thorough list can however be consulted at ICRC 2016 Report 2016, cit., at 72-76.
[127] Quoting Crootof, *The Killer Robots*, cit..
[128] See *The UK Approach to Unmanned Aircraft Systems*, *Joint Doctrine Note 2/11*, 30 March 2011, § 623, at 6/12.
[129] *Ibidem*, at 5/4. See McGinnis, *Accelerating A.I.*, 104 NORTHWESTERN UNIVERSITY LAW REVIEW No. 3 (2010), 1253-1270 (arguing that advanced A.I. capabilities will soon outpace human judgments and even prove 'a civilizing force in war'). Many commentators are convinced that machine's intelligence will be capable of outpacing human brain.
[130] For an in-depth analysis of current technological trends in this field, and legal consequences thereof, see Ekelhof, *Lifting the Fog of Targeting: "Autonomous Weapons" and Human Control through the Lens of Military Targeting*, 71 Naval War College Review No. 3 (2018), 61-94.

neuroscience, engineering and obviously robotics.[131] What is of particular interest is that there are two common approaches to the research in this field: a behavior-based architecture and evolutionary methods.[132] While the first is conceived to reflect aspects of natural evolution in a static fashion, the second one is structurally dynamic, and focuses on the agent's capability of *adapting* its system to the environment. Adaptation is made possible by sensorimotor coordination and advanced evolutionary procedures such as genetic algorithms, evolutionary strategies or genetic programming.[133] Applications of this technology are numerous, and are being studied within the framework of *machine learning*.[134] The observable result is that such agents have gradually acquired – *rectius*, self-learned – capabilities such as exploration, obstacle avoidance, area cleaning, landmark identification, and interestingly *target finding*.[135]

According to many, however, a future battlespace populated only by autonomous machines and with little to no human presence at all is quite

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[131] See Florian, *Autonomous artificial intelligent agents*, Technical Report Coneural-03-01, 4 February 2003, available at: https://www.researchgate.net/publication/228926986_Autonomous_artificial_intelligent_agents, at 1. In particular, the Author explains that while classical A.I. was based on disembodied symbol systems, *nouvelle* A.I. has taken a step further, having realized that embodiment is a condition for learning and adaptability, and thus intelligence can arise only in embodied agents: '[a]rtificial intelligent systems should then develop most of their cognitive structure by learning and self-organize to arrive at emergent behaviors' (*ibidem*, at 9). A general overview of the existing literature on A.I. – which is naturally immense – is not possible here; suffice it to mention, as a quite general framework of the issue, Russell-Norvig, *Artificial Intelligence: A Modern Approach*, Englewood Cliffs, 1995.

[132] See *amplius* Florian, *Autonomous artificial intelligent agents*, cit., at 24-31.

[133] *Ibidem*, at 26.

[134] For more on machine learning, see Kubat, *An Introduction to Machine Learning*[2], Cham, 2017. See *amplius infra*, 1.5.

[135] See Florian, *Autonomous artificial intelligent agents*, cit., at 27. On predictability in real-world scenarios, see *amplius* Marchant et al., *International Governance*, cit., at 284: 'programs with millions of lines of code are written by team of programmers, none of whom knows the entire program; hence, no individual can predict the effect of a given command with absolute certainty, since portions of large programs may interact in unexpected, untested ways … [f]urthermore, increasing complexity may lead to emergent behaviors, i.e., behaviors not programmed but arising out of sheer complexity'. However, it seems more plausible to imagine that, while a chance of unpredictability is natural in this technology, the military as well as law-enforcement agencies will oppose the fielding of autonomous systems whose conduct cannot be controlled.

far, if not utopist.[136] They argue that human cognition shows different features than A.I.: for instance, while machine can outperform humans in repetitive tasks, human intelligence excels in adaptability and creativity, which implies that '[t]he most capable military systems will be those that are optimized to take advantage of the best of both machine and human cognition'.[137] However, creativity is the current challenge for 'strong' A.I.: understanding natural mechanisms, translating them into algorithms and replying them in robo-engineering is precisely what the scientific fields mentioned at the beginning of this paragraph are up to. If it is true that human-machine teaming is an optimal solution to perform given activities (such as coordination),[138] it appears that the ultimate goal is to replace human presence at a certain point.

This will lead to a consequence that has already been outlined: the removal of human intervention in a *specific* decision to exert lethal force against human targets. It is argued that this shift is as much disruptive as inevitable in the future:[139] machines endowed with 'strong' A.I. are expected to 'move too fast', the factors involved therein will be 'too complex for real human comprehension' and the resulting situation 'will be even further from anything humans can reasonably expect to understand, much less intervene in successfully'.[140] Former U.S. Air Force Chief Scientist Werner Dahm states that 'by 2030 machine capabilities will have increased to the

[136] See *ex multis* Scharre, *Robotics on the Battlefield, Part I*, cit., at 32-33.
[137] *Ibidem*, at 34.
[138] See for instance Bradshaw et al., *From tools to teammates: Joint activity in human-agent-robot teams*, 5619 LECTURE NOTES IN COMPUTER SCIENCE (2009), 935-944 (concluding that through interaction and joint activity human types of coordination can be extended to robots in order to have them perform less like tools and more like teammates).
[139] Adams, *Future Warfare*, cit., at 69 (comparing this situation to that of the shift from absolutism to democracy at the beginning of the nineteenth century, when 'the advisers, courtiers and generals that surround the throne are at a loss to determine what it means, much less what to do about it').
[140] *Ibidem*.

point that humans will have become the weakest component in a wide array of systems and processes'.[141]

1.4.2 Swarming techniques

In order to better demonstrate the progressive (and seemingly unstoppable) eclipse of human decision-making, a fitting example is that of swarming techniques.[142] Swarms consist of disparate elements that coordinate and adapt their movements and decisions through simple shared rules in order to give rise to an emergent and coherent whole; the basic idea of swarms is that this whole is qualitatively *superior* to the sum of its elements.[143]

Historically speaking, the first who captured the strategic essence of swarming tactic was Clausewitz, in his famous *On War*: speaking of guerrilla campaigns, he claimed that each element of a swarm would act as 'a dark and menacing cloud out of which a bolt of lightning may strike at any time'.[144]

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[141] Dahm, *Report On Technology Horizons: A Vision For Air Force Science & Technology During 2010-2030*, 2010, at 106.

[142] See ICRC 2016 Report, cit., at 77. One of the most complete work on swarming as a military technique is the study of Arquilla-Ronfeldt, *Swarming and the Future of Conflict*, RAND-National Defense Research Institute, 2000. Importantly, according to the authors swarming is to be considered as the more recent 'doctrine' in the military, along with what they call 'melée', 'massing' and 'maneuver'; what is more, they support the idea that this doctrine may eventually apply across the entire spectrum of the use of force, from civic-oriented actions in low-intensity conflict to high-intensity military operations on land, at sea and in the air. Analogously, see *amplius* Edwards, *Swarming and the Future of Warfare*, Pardee Rand Graduate School, 2005 (providing for an in-depth analysis of swarming policies and elaborating a real 'theory' to successfully employ swarming in battlefield).

[143] See Scharre, *Robotics on the Battlefield Part II. The Coming Swarm*, Center for a New American Security, October 2014. In particular, the Author underscores how important for current studies in robotics swarms are the studies in natural swarms: ants, bees and termites exhibit extraordinarily complex behaviour when aggregated in swarms. For instance, ants cooperate to build a bridge with their bodies, This is thanks to the sharing of very simple rules in performing given actions, such as collecting food, flocking, construction and moving. Understanding how these rules work is fundamental to be able to reply them for robotic systems; see ibidem, at 24-25. For a more technical analysis, see Lachow, *The upside and downside of swarming drones*, 73 Bulletin of the Atomic Scientists No. 2 (2017). 96-101.

[144] Clausewitz, *On War*, Princeton, 1976, at 581.

Today, military research is studying swarming techniques at sea (e.g. DARPA's *Hydra* program),[145] as well as in the air.[146] The US Air Force has developed a fleet of micro-UAVs named *Perdix*,[147] and, less recently, small uninhabited air vehicles called MALD (Miniature Air-Launched Decoy) have been developed to deceive enemy radars; an update version called MALD-J (Miniature Air-Launched Decoy-Jammer) can also attack enemy radars.[148]

One important drive for swarming technology is the importance of *mass* in today's warfare, both strategically and economically. Large numbers of uninhabited vehicles operating as a swarm: (*i*) ensure a better understanding of the operational environment, having more eyes on the target; (*ii*) if armed, exponentially increase the offensive capabilities; (*iii*) force the enemy to expend more munitions, while preserving resiliency.[149] In addition to this, swarms counter rising costs for military aircrafts, since individual components are far less expensive than single aircrafts, and so it is the whole of them in comparison with a fleet.

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[145] Hydra consists of a distributed undersea network of unmanned payloads and platform to support manned vessels and expand their capabilities above, on and below the ocean's surface. See https://www.darpa.mil/program/hydra.

[146] A famous example being the US Navy's Low-Cost UAV Swarming Technology (as the acronym goes, LOCUST), to be deployed both as defensive and as offensive weapons. See Hambling, *Drone swarms will change the face of modern warfare*, Wired, 7 January 2016 (explaining the main features of LOCUST and underscoring that 2016 would be a 'breakthrough year for drone swarms', a technology able to 'change the face of the battlefield – especially when the drones are armed').

[147] Perdix are meant to be launched from fighter aircrafts to fly safely closer to ground and perform ISR tasks (i.e. capturing video). Recent developments are allowing this technology to be used from the ground and sea. See *Perdix UAVs Deployed Successfully From U.S. Navy F-18's*, UAS Weekly, 11 January 2017, available at http://uasweekly.com/2017/01/11/perdix-uavs-deployed-successfully-u-s-navy-f-18s/.

[148] See http://www.raytheon.com/capabilities/products/mald/.

[149] As for the strategic impact of swarms, it seems appropriate to cite the so-called Lanchester's Square Law, according to which relative combat power is proportional to the square of the relative sizes of opposing forces; in other words, *coeteris paribus*, having twice as many units in battlefield translates to a fourfold increase in combat power; see Scharre, *Robotics on the Battlefield Part II*, cit., at 18.

In terms of decision-making, the key notion of swarming techniques is *dispersion*.[150] The number of elements composing a robotic swarm naturally exceeds the number of corresponding human operators. Being one-to-one relationship unfeasible for strategic purposes, it follows that while operators play a role only in *critical* situations most decisions are left to machines.[151]. The advantages of such approach are: reduced risk of hijacking; increased resiliency and adaptability; accelerated tempo of action; in short, *efficiency*. Swarms are likely to replicate a feature that has already been tackled before: the separation between higher-level commander's choice, which is taken on a *general* level by the human operator, and concrete, operative decisions, which is taken on a *specific* level by the machine itself acting in accordance with the abovementioned general directives.[152]

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[150] See Arquilla-Ronfeldt, *Swarming*, cit., at 76; Edwards, Edwards, *Swarming and the Future of Warfare*, cit., *passim* and 62 ff. (arguing for the importance of dispersion in guerrilla and special operations scenarios).

[151] See Scharre, *Robotics on the Battlefield Part II*, cit., at 35. Such decision-making process may take the shape of 'coordination by consensus' (i.e. when 'swarm elements communicate to one another and converge on a solution through voting or auction-based methods') or 'emergent coordination' (i.e. when 'coordination arises naturally by individual swarm elements reacting to others, like in animal swarms'), in a bottom-up rather than top-down approach. See also Singer, *Wired for War*, cit., at 235 (underlying how 'perpetual novelty' is naturally built in swarms, which makes them at the same time positive – as conferring undisputable military advantage – and negative – as risking being 'non-understandable' to the party employing them). However, in the writer's opinion, it seems hard to imagine that the military will deploy a weapon upon which it is expected to exert insufficient levels of control.

[152] The issue of swarm's decision-making process has received extensive attention in the scientific literature. One of the greatest challenge is to understand and predict how robotic swarms organize their own decision-making process in order to achieve the so-called 'best-of-*n*' solution to concrete problems, especially giving the growing interest of the scientific community in evolutionary robots (i.e. highly adaptable robots). The latter however are still at a rudimentary phase, not existing in reality yet but only in computer simulations. See *amplius* Valentini-Ferrante-Dorigo, *The Best-of-*n *Problem in Robot Swarms: Formalization, State of the Art, and Novel Perspectives*, 9 FRONTIERS IN ROBOTICS AND AI No. 4 (2017), 1-18. See also McFarland, *Factors shaping the legal implications of increasingly autonomous military systems*, 97 INTERNATIONAL REVIEW OF THE RED CROSS (2016), 1313-1339, particularly at 1331-1333 (arguing that swarm technology will be used in synergy with human presence and not as its replacement).

To many, the fact that the decision-making process is likely to be diluted and distributed among human and non-human agents does not mean removing humans from the process altogether:[153] there will be a different (and surely unprecedented) type of human-machine interaction, and operators will need proper training 'to understand the behavior and limits of swarm automation in real-world environments'.[154] However, '[i]t is still humans who will fight wars, only with different weapons'.[155]

This is hard to dispute on a general level: nobody could seriously contend that the deployment of robotic swarms is tantamount to removing humans from the decision-making circuit. The real point is *what is concretely left* to human decision-making, considered that: (*i*) swarms will be composed of dozens of elements, in order for tactical efficiency; (*ii*) a single human operator will supervise the work of several swarm elements, being prevented from controlling each one constantly; (*iii*) environmental complexity, coupled with technological sophistication of the machines, will be pushing human intervention in limited cases, in which higher-level control is required. All these factors taken together, once appropriate levels of situational awareness and algorithmic consistency with rules governing the use of force are reached, specific critical decisions will be likely entrusted to the single swarm element.[156] Subsequently, it is expected that human controllers will intervene only on a general plane, for instance deciding when to deploy a swarm and in cases of reported malfunctioning.

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[153] See Scharre, *Robotics on the Battlefield Part II*, cit., at 40-41.

[154] *Ibidem*, at 41.

[155] *Ibidem*, at 48. Drivers for huge developments in the field are fuelled by the rhetorical distinction between 'defensive' and 'offensive' weapons: while defensive swarms may raise few objections, thus gaining more acceptance, offensive weapons may be far more problematic. The distinction is however rightly believed to be quite fictional: once technology is accepted, its employment for different purposes will be easier to accept. On this point, see also Lachow, *The upside and downside*, cit., at 100.

[156] A telling conclusion in this sense is provided for by Coppin-Legras, *Autonomy Spectrum*, cit., in particular at 602: '[e]xperiments with human operators have shown that although the human has a positive role to play in the control and supervision of the autonomous agents, *the representation gap* between the human and swarm intelligence *calls for more advanced* HCI [Human-Computer Interface] tools', italics added.

Concluding, it has been demonstrated that swarming techniques are probably the most suitable example of technological development that could open up unprecedented scenarios of 'autonomy' and 'lethality' intermingled. Employing the categories of human 'in-', 'or-' and 'out-of-' the-loop, albeit descriptively useful, offers little to no help to understanding how far a human presence is involved in swarm's autonomous lethal decisions.

1.5. Algorithmic Target Construction (ATC)

Our overview on current and future applications of autonomy has helped understand the extent to which it impacts on human decision-making. The common denominator of these applications is the following: a potential for progressive, radical *dilution* of human presence at specific force delivery.[157] It is now time to turn to considering the foreseeable operational mode of LAWS, taking into account their critical functions: target *selection* and target *engagement*.

For the sake of clarity we will refer to the process leading to a singular decision on the use of force against a human target as '*Algorithmic Target Construction*' (ATC). This concept has been recently adopted in an Academy Briefing of the Geneva Academy of International Humanitarian Law and Human Rights.[158] Proceeding in reverse order, 'Construction' refers to a methodology of gathering and then re-elaborating *data* which constitute the very input of the process. The outcome is to identify a 'Target', namely an individual or group of individuals that will be made the

[157] For the consequences of such 'dilution' in the decision-making chain of military targeting process, see Ekelhof, *Lifting the Fog of Targeting*, cit., at 83 ('implementing autonomous technologies will affect the control that human actors further down the chain (i.e., within the targeting process) can exercise').

[158] See Brehm, *Defending The Boundary. Constraints And Requirements On The Use Of Autonomous Weapon Systems Under International Humanitarian And Human Rights Law*, Academy Briefing No. 9, May 2017, available at https://www.geneva-academy.ch/joomlatools-files/docman-files/Briefing9_interactif.pdf.

object of force delivery, while the process through which data are re-elaborated is 'Algorithmic'.

The notion of ATC can be 'unpacked' in order to which role data actually play and how the process of decision-making works. It seems appropriate to distinguish at least between two particularly salient temporal stages, namely data collection (1.5.1) and their processing through algorithms (1.5.2) in order to capture the essence what the notion of 'autonomous' decision-making entails (1.5.3).

1.5.1 Data Collection

Data collection is generally considered as the first component of 'processing'. To be employed in an operational scenario, LAWS will need to collect as much data as possible from the field, and therefore they will presumably be endowed with software for carrying out a preliminary screening of individual and places.[159]

A wide spectrum of data is likely to be gathered for the purposes of ATC. To begin with, most data regard the individual that may be made the target of an attack (i.e. *personal* data);[160] among personal data, 'sensitive' data are accorded a stronger protection.[161] This is due to the circumstance that they may reveal racial or ethnic origin, political opinions, religious or philosophical beliefs, or trade union membership – information whose

[159] For a general appraisal of LAWS and the impact of their technology on data collection, see Spagnolo, *Human Rights implications of autonomous weapon systems in domestic law enforcement: sci-fi reflections on a lo-fi reality*, 43 QIL Zoom-In (2017), 33-58, *passim* and particularly at 43.

[160] Which can be defined as 'any information relating to an identified or identifiable' individual. For this definition, see Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation; hereinafter: GDPR). See also the *Modernized Convention for the Protection of Individuals with Regard to the Processing of Personal Data*, adopted by the 128th Session of the Committee of Ministers in Elsinore, Denmark, on 18 May 2018, CM/Inf(2018)15-final (CETS No. 108) (hereinafter: Modernized Convention), art. 2.

[161] For a list of personal data that must be considered as 'sensitive' inasmuch as revealing certain personal characteristics, see for instance GDPR, art. 9.

treatment may expose the individual to discriminatory measures.[162] 'Biometric' data are also an important category of personal data, as they include 'personal data resulting from specific technical processing relating to the physical, physiological or behavioral characteristics of a natural person, which allow or confirm the unique identification of that natural person, such as facial images or dactyloscopic data'.[163] Importantly, 'biometric' data are believed to be the next step for drone operations, as they would provide for more performing recognition of individuals.[164] Systems that employ biometric techniques are undergoing an impressive development.[165] Possibly more concerning than these types of personal data is a quite new generation of aggregated data, namely 'big data'.[166] These

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[162] On the legal implications of data collection on human rights, see *amplius* Chapter III (where LAWS's impact on IHRL will make the object of a dedicated analysis).

[163] See GDPR, art. 4(14).

[164] See Thompson, *Drones in Domestic Surveillance Operations: Fourth Amendment Implications and Legislative Responses*, United States Congressional Research Service, Report No. 7-5700, 6 September 2012, at 3-4 (arguing that '[i]n 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'). See also Rosén, *Extremely Stealthy and Incredibly Close*, cit., at 6 ('[s]oon 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'). Biometric identification is also one of the fields where neural networks are progressing the most; see for instance the extensive contribution of Donohue, *Technological Leap, Statutory Gap, and Constitutional Abyss: Remote Biometric Identification Comes of Age*, 97 Minnesota Law Review (2012), 408-559, at 543-548 (discussing facial recognition and expressing concern about abuse of this technology).

[165] To name one example, in 2012 Hitachi Hokusai Electric announced that its last biometric surveillance camera could scan 36 million faces per second, significantly enhancing existing facial recognition capabilities. See Waugh, *Big Brother just got scarier: Japanese CCTV camera can scan 36 million faces per second - and recognise anyone who has walked into its gaze*, 23 March 2012, available at: http://www.dailymail.co.uk/sciencetech/article-2119386/Could- governments-recognise-ANYONE-instantly-CCTV-Japanese-camera-scan-36-million-faces-second.html.

[166] For a general overview of the phenomenon (*recte*: phenomena) associated with 'big data', see Della Morte, *Big Data e protezione internazionale dei diritti umani. Regole e conflitti*, Naples, 2018, in particular at 158 ff. (conducting a comprehensive review of existing literature); Oddenino, *Reflections on Big Data and International Law*, 31 Rivista del Commercio Internazionale No. 4 (2017), 777-806; and Cavanillas-Curry-Wahlster, *New Horizons for a Data-Driven Economy*, Springer, 2016. For a special category of big data, namely 'metadata', see Stalla-Bourdillon et al., *Metadata, Traffic Data, Communications Data, Service Use Information... What is the Difference? Does the Difference Matter? An Interdisciplinary View from*

have been defined as 'gigantic digital datasets […] which are […] extensively analyzed using computer algorithms and can be used to identify more general trends and correlations or processed in order to directly affect individuals'.[167]

The importance of data gathering for ATC could hardly be underestimated. With regard to the current use of armed drones, an author has even coined the phrase 'emergence of Data-Driven warfare'.[168] The case of 'signature strikes' is a telling one. The term – now one of the art – refers to a methodology for selecting actual targets for drone strikes basing solely on their observed pattern of behavior (i.e. their 'signature').[169] The target's personal identity remains unknown *before* the strike and may remain so also *after* it. It differs from a 'personality strike' in that in the latter the target's personal identity is known to the authorities before the strike, which as a matter of fact takes place by virtue of the target's personal identification. Signature strikes have gained momentum under the Obama Administration, albeit some initial reservations.[170] They were believed not

the UK, in Gutwirth-Leens-de Hert (eds.), *Data Protection on the Move Current Developments in ICT and Privacy/Data Protection*, Dordrecht, 2016, 438 ff. (distinguishing among network-level metadata, application-level metadata, and service-use metadata).

[167] See Oddenino, *Reflections on Big Data*, cit., at 779.

[168] This is the famous expression employed by Rothenberg, *Drones and the Emergence of Data-Driven Warfare*, in Bergen-Rothenberg (eds.), cit., 441-462, in particular at 444 (underscoring the importance of '[t]he coordination of information gathered […] as part of a networked system that is complexly and multiply linked to other sources of data collection and analysis').

[169] For a thorough definition of signature strikes, reference can be made to Benson, *"Kill 'em and Sort it Out Later:" Signature Drone Strikes and International Humanitarian Law*, 27 Global Business & Development Law Journal No. 1, (2014), 17-51, at 18. See also Holewinski, *Just Trust Us*, in Bergen-Rothenberg, cit., at 45-46; Kindervater, *The Emergence of Lethal Surveillance: Watching and Killing in the History of Drone Technology*, 47 Security Dialogue No. 3 (2016), at 224 ff.; Wall-Monahan, *Surveillance and Violence from Afar: The Politics of Drones and Liminal Security-Scapes*, 15 Theoretical Criminology No. 3 (2011), at 239–245.

[170] See the anecdote told by Zenko, *Targeted Killing and Signature Strikes*, Council On Foreign Relations, 16 July 2012, at http://blogs.cfr.org/zenko/2012/07/16/targeted-killings-and-signature-strikes/ (citing one legal advisor that so described the President's unease at striking at military-age males associated with terrorist activities but whose personal identity remained unknown: '[H]e didn't like the idea of kill 'em and sort it out later').

to cause a 'huge number of civilian casualties'[171] and thus to work as an appropriate tool against the 'Global War on Terror'.[172] It has been argued that signature strikes are of great use as they contribute actively in the set-up of databases where collected and analyzed data are stored;[173] the same can be applied *mutatis mutandis* to LAWS.

To sum, it appears that the link between data collection and ATC – lamentably left at the margins of the debate around armed drones and LAWS –[174] is one deserving further attention, not only for its potential to subject an indefinite number of individuals to surveillance techniques, but also having regard to the use that data collectors will make of such data. The remainder of the Paragraph is dedicated to this issue.

1.5.2 Data Re-elaboration: Algorithms in Action

The massive amount of data gathered by the system will then undergo a process of re-elaboration involving a set of algorithms. The notion of algorithm has been addressed by numerous scholars; in pretty general terms, algorithms can be defined as processes or sets of rules to be followed in problem-solving operations.[175] In particular, algorithms allow for

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[171] See Woods et al., *Emerging from the Shadows: US Covert Drone Strikes in 2012*, Bureau Of Investigative Journalism (Jan. 3, 2013), http://www.thebureauinvestigates.com/2013/01/03/emerging-from- the-shadows-us-covert-drone-strikes-in-2012-2/.

[172] Numbers and figures regarding the first year of the Trump Administration confirm that drone strikes are the first choice in counterterrorism abroad. See https://www.thebureauinvestigates.com/stories/2018-01-19/strikes-in-somalia-and-yemen-triple-in-trumps-first-year-in-office (showing that the number of strikes conducted in Yemen and Somalia in 2017 is nearly more than triple the number carried out the year before).

[173] See Weber, *Keep adding. On kill lists, drone warfare and the politics of databases*, 34 Society and Space No. 1 (2016), 107-125, at 108.

[174] On this point, and more generally on the topic of armed drones and big data, see Binder, *The emergence of Big Drone Data? Analyzing debates on drones as data gathering means in intelligence*, 2017, available at: https://zenodo.org/record/571552#.Wz4QBdIzbIV.

[175] See Oxford Dictionary, *Algorithm*, at https://en.oxforddictionaries.com/definition/algorithm. For a basic literature on what algorithms are and how they work in practice, reference can be made to Sartor, *L'informatica giuridica e le tecnologie dell'informazione. Corso di informatica giuridica*, Turin, 2016, 81-140 and *passim*; Gillespie, *The Relevance of Algorithms*, in Gillespie-Boczkowski-Foot

producing a certain amount of results ('output') starting from a set of initial data ('input'). Applying this definition to ATC, it means that algorithms are the means through which LAWS employ collected data to reach a final decision.

At least three features of algorithms are relevant for our analysis. First, they have to be *effective* in the sense that they are capable of producing an actual, concrete outcome.[176] Second, they have to be *efficient*: an algorithm that produces an outcome only after a long period of time would hardly be workable in most contexts.[177] Third, they have to be *finite*, i.e. to capable of leading to the solution of a problem in a finite number of steps, in which each one is followed by another *in a deterministic manner*.[178] This third element is of particular importance for our purposes, as it unveils (or unmasks) a remarkable limitation that is inherent in algorithmic processes: they cannot be open-ended, in the sense that they are structurally at odds with concepts such as 'freedom', 'autonomy' relating to human agents.[179] There actually is another feature of algorithms that raises concern, namely their possible *opaqueness*.[180] Yet effective and efficient, and notwithstanding their functioning is structurally deterministic, the way algorithms operate may turn out to be hardly understandable (or 'legible')[181] to human agents. This may have a negative impact on *reliability*, in that humans may encounter obstacles in predicting algorithms' possible outcomes.[182]

(eds.), *Media Technologies: Essays on Communication, Materiality, and Society*, 2014, 167-193, at 167 (defining algorithms as 'encoded procedures for transforming input data into a desired output, based on specified calculations'); Zellini, *La dittatura del calcolo*, Milan, 2018, at 15 and *passim*.

[176] See Zellini, *La dittatura del calcolo*, cit., at 15.

[177] See Sartor, *L'informatica giuridica e le tecnologie dell'informazione*, cit., 95-100.

[178] See Zellini, *La dittatura del calcolo*, cit., at 15.

[179] Recall the arguments discussed *supra* at 1.2.

[180] See for instance Zellini, *La dittatura del calcolo*, cit., at 155 (discussing modern automatic calculation techniques and employing the notion of 'hidden computation' to describe how obscure such techniques are to human observers).

[181] The notion of 'legibility' will be tackled later; see Chapter III.

[182] For a more focused reflection on LAWS, see Roff-Danks, *"Trust but Verify": The Difficulty of Trusting Autonomous Weapons Systems*, Journal of Military Ethics (2018), 1-19, 4-6 and *passim*; Righetti, *Emerging technologies and future autonomous weapons*, Speaker's summary, in ICRC 2016 Report, cit., 36-39 (emphasizing that algorithms are structurally well-defined

A particular class of algorithms is believed to play a key role in ATC in the near future, namely *self-learning* algorithms. 'Machine-learning' is a subfield of computer science seeking to elaborate programs capable of learning from experience and thus improving their performance over time:[183] while self-learning algorithms may perform poorly at early stages, their performance improves by analyzing more data, in a, say, exponential trend.[184] Brief, LAWS 'machine-learning' algorithms in ATC will be able to generate rules and conduct basing on its initial databank and gained experience 'in the field',[185] which essentially means that their ability to select and engage targets properly will depend on previous experience in the relevant operational field (battlefield; law-enforcement area of operations; etc.). The complexity of those algorithms should not be underestimated though. For example, it seems that in a near future a particular set of algorithms allowing for *deep learning* techniques will be employed for ATC purposes. Such techniques, which rely on artificial 'neural networks' connected together, have so far proved extremely effective in extracting statistical relationship between inputs and outputs using massive amounts of data.[186]

This (inevitably sketchy) overview was intended more to shed light on some key features that ATC will possess as such then to exhaustively tackle the issue of algorithms and the myriad applications thereof. In view

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in terms of scope of behavior, and thus unpredictability is not to be referred to the complexity of the program, but rather to environmental uncertainty).

[183] On machine learning, see Kurbat, *An Introduction to Machine Learning*, cit.; Flach, *Machine Learning: The Art and Science of Algorithms that Make Sense of Data*, Cambridge, 2012; Surden, *Machine Learning and Law*, 89 Washington Law Review (2014), 87-115, particularly at 89-100; Righetti, *Emerging technologies*, cit., 37-38 (distinguishing three categories of machine-learning, namely supervised learning, reinforcement learning and unsupervised learning). Machine-learning is often categorized as a particular branch of A.I., as the results that self-learning algorithms may produce can appear 'intelligent'; see Russell-Norvig, *Artificial Intelligence*, cit., 3-5.

[184] See *amplius* Surden, *Machine Learning and Law*, cit., at 92.

[185] See Ulgen, *Kantian Ethics in the Age of Artificial Intelligence and Robotics*, 43 QIL Zoom-In (2017), 59-83, at 73.

[186] On deep-learning and neural networks, see Righetti, *Emerging technologies*, cit., 37-38; Sartor, *L'informatica giuridica e le tecnologie dell'informazione*, cit., 287-292; Florian, *Autonomous artificial intelligent agents*, cit., 9 and *passim*.

of the following, the fact that algorithmic processes may get more complicated does not imply that high-order cognitive skills will be necessarily involved. In other words, 'intelligent results' can be accomplished without 'intelligence';[187] in most cases algorithms that employ heuristics and proxies can accomplish tasks ordinarily associated with intellectual processes. Applied to ATC this means that it may be technologically feasible to build a LAWS that is capable of operating in certain environments in an efficient and satisfying manner without waiting for strong-A.I..[188] Again, to contend that 'the killer robots are here' does not seem an exaggeration at all.

1.5.3 Outcome: 'Autonomous' Decision as 'Categorical' Decision

It has been said that it is in the very nature of algorithms to act without human intervention.[189] The cutting-edge difference between 'signature strikes' operated via armed drones and LAWS is reflected in that algorithmic decision-making covers not only target selection, but also target engagement.

To begin with target selection, entrusting a machine with the task of individuating humans that can be made the object of targeting raises numerous concerns also where the actual decision (i.e. whether to engage the algorithmically-selected target or not) is left to the human operator. We already argued that human decisions of this kind can be easily affected by the so-called 'automation bias', as human agents tend not to contest or to

[187] Quoting Surden, *Machine Learning and Law*, cit., at 95 (resorting to the notorious case of spam email – such as those containing the text 'earn extra cash' – in order to show how a relatively simple algorithm, able to make automated classifications, can perform apparently complicated tasks – such as detecting spam email – without understanding the meaning of data – the email text – and therefore approximate what a human agent would have done only after reading and comprehending an email).

[188] Incidentally it is interesting to note that while the requirement of strong-A.I. capabilities seems implied in the UK's 2017 Joint Doctrine Note, cit., at 14 (defining LAWS as systems 'capable of understanding higher level intent and direction'), Directive 3000.09 does without it, as it requires a less demanding standard (absence of human intervention).

[189] See Gillespie, *The Relevance of Algorithms*, cit,, at 170.

disregard contradictory computer-generated solutions.[190] It is a phenomenon observable in the practice of 'signature strikes' as well.[191] In (only) apparent self-contradiction, automation bias is even more problematic when more 'intelligent', higher-reliable systems provide decision support for humans, as the latter will be pushed to defer to machines much more.[192]

ATC is even more problematic when the final critical decision (to engage or not to engage) is entrusted to LAWS. 'Automated' decision-making processes are already in place in different contexts, such as recruitment, behavioral advertisement, access to credit.[193] LAWS, by contrast, in addition to operating through 'autonomous' decision-making processes,[194] have a more profound impact on their targets as they may take a decision resulting in depriving them of their lives. The extent to which their 'decision' can be regarded and thus treated as happens with respect to human decisions is doubtful, given their inherently deterministic nature. It has been said that algorithmic decision-making is 'categorical' in the sense that inasmuch as being deterministically constrained it cannot be considered as a 'free' choice.[195]

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[190] Such phenomenon has been convincingly explained by Cummings, *Automation Bias*, cit., *passim* (citing the historical example of the crash of an airplane into the Florida Everglades in 1972 as a result of an omission error generated by the pilot's bias in a critical event diagnosis).

[191] See Chengeta, *Defining the emerging notion of "Meaningful Human Control" in Weapon Systems*, 49 New York University International Law and Politics (2017), 833-890, at 852-853.

[192] As explained by Cummings, *Automation Bias*, cit., at 5 (outlining the potential negative effects of increasing levels of automation, and proposing to correct such perverse outcome through system reliability enhancement).

[193] Algorithms that rely on 'profiling' of the concerned individuals to reach a 'decision' are currently employed, for example, to refuse an online credit application or e-recruitment practice. For an interesting overview of today's pervasiveness of profiling and automated decision-making, see Chander, *The Racist Algorithm?*, 115 Michigan Law Review No. 6 (2017), 1023-1045.

[194] For the distinction between 'automated' and 'autonomous', see *supra*.

[195] See Ulgen, *Kantian Ethics*, cit., at 68 (citing Kant's reflections the idea of 'spontaneity', which is born out of reason and involve the capacity of starting to act without needing a precedent cause for action).

'Categorization' is therefore contrasted with 'spontaneity'.[196] There is however at least another meaning that 'categorization' may have, namely one that seems particularly appropriate to describe the actual functioning of ATC. Imagine a case where LAWS select and engage a human target basing on ATC. Collected data will go through a process of organization and structuring; in particular, applying the same methodology currently in use for signature strikes, LAWS will likely employ software allowing for detecting individuals or group of individuals possessing certain personal attributes that are considered as statistically correlated to certain conducts ('*profiling*').[197] The purpose of such process is to predict an individual's action on the basis of a so-called 'pattern of life analysis'; the individuals whose data are gathered and elaborated by the machine are therefore 'reduced' to a profile and put into 'categories'. Such type of analysis and technique of re-elaboration of personal data has been used for signature strikes since the beginning,[198] so that LAWS will be programmed so is more than a mere prevision.[199] In short, the 'theory' behind such process is that 'an individual's pattern of behavior – or "signature" – serves as a proxy for determining if that individual' may be a target for the use of force.[200]

In sum, ATC as an algorithmic-driven process leading to the selection and (in the case of LAWS) engagement of a human target is 'categorical' in a two-fold sense: first, it lacks spontaneity, a basic attribution of human decision-making; second, it 'profiles' (i.e. puts into categories)

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[196] The parallel is interestingly suggested by Zellini, *La dittatura del calcolo*, cit., at 16.

[197] See GDPR, art. 4(4): '"profiling" means any form of automated processing of personal data consisting of the use of personal data to evaluate certain personal aspects relating to a natural person, in particular to analyse or predict aspects concerning that natural person's performance at work, economic situation, health, personal preferences, interests, reliability, behaviour, location or movements'.

[198] See Abè, *Dreams in Infrared: The Woes of an American Drone Operator*, Spiegel Online, 14 December 2012 ('[w]e watch people for months. We see them playing with their dogs or doing their laundry. We know their patterns like we know our neighbors' patterns. We even go to their funerals'); Miller, *At CIA, a Convert to Islam Leads the Terrorism Hunt*, Washington Post, 24 March 2012.

[199] See Schmitt-Thurner, *"Out of the Loop"*, cit., at 268.

[200] Paraphrasing Benson, *Kill 'em and Sort It Out Later*, cit., at 29.

individuals whose data are gathered in order to determine whether they can be made the object of targeting or not.

1.6 Concluding Remarks

Humans sought for increased stand-off from harm without losing in accuracy: LAWS were so invented. LAWS are a perfect combination of *lethality* and *autonomy*: the pivotal point of their technology is that they offer a weapon able to behave not worse than a human agent when performing critical functions, such as employing force against human targets, without exposing this human agent to risk.

In the space of their autonomy, LAWS will be able to perform entire 'OODA loops' without relying on human operators, whose role is going to *decrease* as much as the degree of machine's autonomy increase: this idea is captured by the 'spectrums' analyzed above. A dynamic notion of autonomy is thus better suited for describing how it can really vary depending on the considered function: while high levels of autonomy raise little to no concern in take-off and landing, selection and engagement of human targets understandably do.

Existing weapons show rudimentary levels of autonomy, especially as far as these critical functions are considered; but the premises – and the promises – of entirely new levels are already here. Strong A.I. and swarming will bring about an epochal shift in the history of the use of force between humans, both in and out of armed conflict. They make it crystal-clear that in the near future the *specific* decision to use force – i.e.: the potentially *lethal decision* – will be left to a non-human agent, be it an advanced form of intelligence (as for strong A.I.) or a whole of multiple robotic elements (as for swarms). Remoteness has apparently conquered a new terrain: *not only are human far from the operational scenario, they may also be absent in the single decision*.

Chapter II

LAWS IN INTERNATIONAL HUMANITARIAN LAW

SUMMARY: 2.1 Introduction. – 2.2 Weapons Law. – *2.2.1 Overview. – 2.2.2 Prohibition of Weapons Causing Unnecessary Suffering and Superfluous Injury. – 2.2.3 Prohibition of Indiscriminate Weapons. – 2.2.4 Obligation to Conduct a Legal Review.* – 2.3 Targeting Law. – 2.3.1 *Overview. – 2.3.2 Distinction. – 2.3.3 Proportionality. – 2.3.4 Precautions in Attack.* – 2.4 An Incidental Conclusion on LAWS: Weapons, Combatants, or *Tertium*? – 2.5 'Principles of Humanity' & 'Dictates of Public Conscience'. – *2.5.1 The Martens Clause. – 2.5.2 The Relevance of the Martens Clause for the Debate on LAWS.* – 2.6 Concluding Remarks.

The general who wins the battle
makes many calculations in his temple
(Sun Tzu, *The Art of War*, 545-470 BC)

2.1 Introduction

International law applicable to armed conflict takes the telling name of International *Humanitarian* Law (IHL), a label that has replaced the old-fashioned 'Laws of war', 'Law of Armed Conflict' and the Latin *jus in bello*.[201] While the latter captures only the scope of application of this body of law (i.e. war, armed conflict), the former contains a clear value judgment on its content: 'humanity', which 'humanitarian' stems from, is literally the core of IHL.

[201] For the shift from the old 'Laws of War' to the new 'Law of Armed Conflict', see Kunz, *The Laws of War*, 50 AMERICAN JOURNAL OF INTERNATIONAL LAW No. 2 (1956), 313-337. The expression 'Law of Armed Conflict' (LOAC) has not however disappeared, being it commonly employed by authoritative scholars; see *ex multis* Solis, *The Law of Armed Conflict: International Humanitarian Law in War*[3], Cambridge, 2016. For a thorough history of this branch of international law, see generally Best, *Humanity in Warfare. The Modern History of International Law of Armed Conflicts*, London, 1980. For a general overview on IHL, see Kolb, *Advanced Introduction to International Humanitarian Law*, Cheltenham-Northampton, 2014.

Today, IHL is commonly understood as the branch of public international law whose purpose is to moderate the conduct of hostilities and to mitigate the suffering they cause.[202] This humanitarian perspective in warfare first surfaced in the second half of the nineteenth century, when the Swiss Henry Dunant, after taking part in the Battle of Solferino in 1859, founded the Red Cross movement, 'a promoter and custodian of the humanitarian idea'[203] that would have transformed in an international organization (the International Committee of the Red Cross – ICRC) whose goal is to alleviate the suffering of those involved in war.[204] ICRC's motto was (and still is) '*Inter Arma Caritas*': the underlying idea is that even in the midst of war a typical human sentiment – charity – should be preserved and inspire the way wars are fought. Dunant's activity is believed to having influenced the adoption of the 1864 Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field,[205] which marked 'the start of the Geneva tradition of humanitarian law'[206] and became the very first instance that international

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[202] See McCoubrey, *International Humanitarian Law: Modern Developments in the Limitation of Warfare*, Dartmouth, 1998, at 1.

[203] In the words of Meyer-McCourbey (eds.), *Reflections on Law and Armed Conflicts: The Selected Works on the Laws of War by the Late Professor Colonel G.I.A.D. Draper*, The Hague-Boston-London, 1998, at 69.

[204] See *amplius* Alexander, *A Short History of International Humanitarian Law*, 26 European Journal of International Law No. 1 (2015), 109-138, at 112; O'Connell, *Historical Development and Legal Basis*, in Fleck, *The Handbook of International Humanitarian Law*, Oxford, 2013, 1-42, at 22; McCourbey, *International Humanitarian Law*, cit., at 16. See also Oberleitner, *Humanitarian Law As A Source Of Human Rights Law*, in Shelton (ed.), *The Oxford Handbook of International Human Rights Law*, Oxford, 275-294, at 286 (arguing that 'Dunant's motivation to assist war victims was both deeply humanitarian and practical at the same time. … Christian humanism and a practical sense for social change sufficed to create [the 'Geneva law'] and its practical arrangements, bringing the fate of individuals into treaty law').

[205] The Convention was adopted on 22 August 1864 by a diplomatic Conference (in which 16 States were represented) gathered in Geneva; it was then replaced by the new Geneva Conventions of 1906, 1929 and finally 1949.

[206] See Alexander, *A Short History*, cit., at 112. It is common to contrast the Geneva tradition (or law) with the Hague tradition (or law), the latter consisting of the Conventions, Regulations and Declarations adopted in 1899 and 1907: while the first is believed to have a clear-cut focus on humanitarian issues, the second focuses solely on methods of warfare; see for instance Pictet, *The Principles of International Humanitarian Law*, 6 International

law protected 'human values as such'.[207] From that moment on, international legal instruments flourished aiming at regulating the rules of warfare, in an attempt to make them more humane: the underlying idea was that if war are part and parcel of human nature – and thus inevitable – humans can *at least* try to limit their perverse effects on humanity. To make some examples, States: renounced the use of explosive projectiles under 400 grams weight during hostilities in 1868;[208] temporarily renounced the launching of projectiles and explosives from balloons in 1899;[209] comprehensively regulated maritime warfare in 1907;[210] established the first binding instrument on prisoners of war in 1929.[211] In 1949, the four Conventions of Geneva were adopted,[212] thus followed by three Additional Protocols (in 1977 and 2005).[213] It has been said that it was only with the

Review of the Red Cross No. 66 (1966), 455-469, at 457 (underlying the importance of Geneva law for ensuring protection to prisoners of war and civilian populations, in opposition to The Hague law, in his exact words 'the law of war proper'). In fact, today's scholars employ such divide only in descriptive terms, pointing out that the two sectors of law have instead a common goal behind the content: they are described as 'two sides of the same coin' (see Bassiouni, *The Normative Framework of International Humanitarian Law: Overlaps, Gaps and Ambiguities*, 8 Transnational Law and Contemporary Problems (1998), 199-237, at 200), and perceive the traditional division as 'highly artificial from a number of points of view' (see McCourbey, *International Humanitarian Law*, cit., at 2).

[207] See Oberleitner, *Humanitarian Law As A Source*, cit., at 286.

[208] See Declaration Renouncing the Use, in Time of War, of Explosive Projectiles Under 400 Grammes Weight, adopted in Saint Petersburg on 11 December 1868.

[209] See Declaration (IV,1), to Prohibit, for the Term of Five Years, the Launching of Projectiles and Explosives from Balloons, and Other Methods of Similar Nature, adopted in The Hague on 29 July 1899.

[210] See Convention (X) for the Adaptation to Maritime Warfare of the Principles of the Geneva Convention, adopted in The Hague on 18 October 1907; it was the result of a process of revision and enlargement of 1899 The Hague Convention (III) concerning the adaptation to maritime warfare of the principles of the abovementioned Geneva Convention of 1864.

[211] Convention relative to the Treatment of Prisoners of War, adopted in Geneva on 27 July 1929; provisions concerning the treatment of prisoners of war were already contained in the Hague Regulations of 1899 and 1907, but had proved insufficient during World War I.

[212] Convention (I) for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field; Convention (II) for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea; Convention (III) relative to the Treatment of Prisoners of War; Convention (IV) relative to the Protection of Civilian Persons in Time of War; all adopted in Geneva on 12 August 1949.

[213] Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), adopted in Geneva on

World Conference on Human Rights in Tehran in 1968 that a clear connection between human rights and humanitarian law was established, rendering explicit what was previously considered implicit or even denied.[214]

The history of IHL as an idyllic reencounter of violence and humanity is however contested by those who contend that any attempt to regulate warfare was always born out of imperialism and oppression from Western powers.[215] Having established rules devoted to protecting their own citizens, Western powers have always hypocritically 'trumped humane values' in the name of 'compromise and pragmatism'.[216] It is argued that irrespective of the chosen narratives contemporary IHL stands in a 'long continuum with other codes of warfare'.[217] If one wanted to pinpoint a feature that has been marking the entire history of regulating warfare, linking every step in such continuum, this could be the idea of *limitation:* in short, parties to hostilities have agreed upon self-restraining reciprocally at given conditions when waging war. This trend can be found

8 June 1977; Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II), adopted in Geneva on 8 June 1977; Protocol additional to the Geneva Conventions of 12 August 1949, and relating to the Adoption of an Additional Distinctive Emblem (Protocol III), adopted in Geneva on 8 December 2005.

[214] See Oberleitner, *Humanitarian Law As A Source*, cit., at 290-291. Resolution XXIII was accordingly entitled 'Human Rights in Armed Conflict'. As this point clearly refers to IHRL, it will be discussed later; see *amplius infra*, Chapter III.

[215] See for instance Jochnick-Normand, *The Legitimation of Violence: A Critical History of the Laws of War*, 35 Harvard International Law Journal (1994), 49-95; Anghie, *Finding the Peripheries: Sovereignty and Colonialism in Nineteenth-Century International Law*, 40 Harvard International Law Journal, 1999 (criticizing the sovereignty doctrine that inspired nineteenth-century positivism in international law); Mégret, *From 'savages' to 'unlawful combatants': a postcolonial look at international humanitarian law's 'other'*, in Orford (ed.), *International Law and its others*, 2006, 265-317 (pointing out the mark of racism and colonialism that affected modern laws of war); Weizman, *The Least of All Possible Evils*, 2011, 1-24 (unveiling the hypocritical rhetoric of lesser evil as a justification for continuing inflicting harm).

[216] See Alexander, *A Short History*, cit., at 113.

[217] *Ibidem*.

as constant temporally (e.g. in ancient times, middle ages, modernity) as well as geographically (Middle-East; China, Japan, India, etc.).[218]

Schmitt places the idea of limitation at the core of the *jus publicum Europaeum*, that is the first concrete spatial order of the globe: the birth of modern States and the termination of religious wars, which Schmitt defines 'detheologization' of the new interstate order of the European continent, for the very first time made it possible the rationalization and *humanization* of war, i.e. the possibility of 'bracketing' war in international law.[219] Religious and civil laws, which were essentially total wars (in the sense that everything was allowed to overcome the enemy) were then replaced by interstate wars, which were wars '*en forme*'. It is important to underscore that this new form of war was valid exclusively on European soil: wars conducted overseas (that is, beyond the lines dividing the 'old' from the 'new' world) remained subject to 'the law of the stronger', according to which 'force could be used freely and ruthlessly'.[220] In other words, the idea of limitation in interstate wars was spatially limited to Europe; it took few more centuries (around the end of the nineteenth century) to be extended to the whole globe and become truly universal.

In the twentieth century limitation was thus naturally considered to be at the core of the then laws of war; Oppenheim's *International Law* states this in clear terms. According to it, the first principle regulating the 'rules of the Law of Nations respecting warfare' stipulates that 'a belligerent is justified in applying any amount and any kind of force which is necessary for the realization of the purpose of war – namely, the overpowering of the opponent'.[221] It is commonly referred to as principle of *military necessity*. The second principle is named principle of *humanity* and requires that 'all such

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[218] See Alexander, *A Short History*, cit., at 112; McCoubrey, *International Humanitarian Law*, cit., at 8; Sassoli-Bouvier, *How Does Law Protect in War?Cases, Documents and Teaching Materials on Contemporary Practice in International Humanitarian Law*, Geneva, 2006, at 124-125; Meron, *Bloody Constraint: War and Chivalry in Shakespeare*, Oxford, 1998, at 12.

[219] Schmitt, *The* Nomos *of the Earth*, cit., at 141, *italics mine*.

[220] *Ibidem*, at 94.

[221] See Lauterpacht (ed.), *Oppenheim's International Law: A Treatise*[7], London, 1952, at 227.

kinds and degrees of violence as are not necessary for the overpowering of the enemy should not be permitted to the belligerent'.[222] Limitation appears thus to be the result of an inevitable clash between the principle of military necessity on the one hand and the principle of humanity on the other hand: depending on which one prevails, constraint in what is permissible during hostilities will be higher or lower.[223] To others, conversely, humanity and military necessity should not be understood as opposing forces but rather as complementary ones: also military necessity would be grounded in the idea of limitation.[224]

The theoretical relationship between humanity and military necessity is however far beyond the purposes of the present discussion. A tendency towards limitation can be seen as a colonialist instrument of prevarication in the hands of Western power: this is what critics of realistic approaches to IHL would claim. Oppositely, ideologists would explain limitation as the main feature of humanitarianism: in the name of humanity, attempts have been made to prohibit weapons, means and methods of warfare; to establish clear rules regarding whom to target and how to exert

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[222] *Ibidem*.

[223] This position is eminently defended by Sandoz-Swinarski-Zimmermann (eds.), *Commentary on the Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 August 1949*, Geneva, 1987, at 683: '[t]he entire law of armed conflict is, of course, the result of an equitable balance between the necessities of war and humanitarian requirements'; see also Cassese, *International Law*[2], Oxford, 2005, at 402 (outlining an opposition between military necessity and human rights values); Abi-Saab, *The Specificities of Humanitarian Law*, in Swinarski (ed.), *Studies and Essays on International Humanitarian Law and Red Cross Principles in Honour of Jean Pictet,* Geneva-The Hague, 1984, 265-280, at 265 (according to whom '[i]t is the dialectical relation between these two forces, in light of historical experience, which determines the contents, contours and characteristics of the law of war at any moment'); Schmitt, *Military Necessity and Humanity in International Humanitarian Law: Preserving the Delicate Balance*, 50 Virginia Journal of International Law No. 4 (2010), 795-840, at 798 (employing the same expressions of balancing military necessity and humanity which result in 'a dialectical compromise between these two opposing forces').

[224] See Beer, *Humanity Considerations Cannot Reduce War's Hazards Alone: Revitalizing the Concept of Military Necessity*, 26 European Journal of International Law No. 4 (2015), 801-828 (pushing for the transformation of concrete military standards into legal norms in order to gain what abstract humanity cannot); Blum, *The Laws of War and the 'Lesser Evil'*, 135 Yale Journal of International Law (2010), 1-69 (underlying the dual legal function of military necessity as both an enabling and constraining principle).

lethal force; to reduce suffering in battlefield.[225] Be that as it may, limitation has always played a role in the history of IHL, and so does it today: a glimmer of restraint, though lamentably dim, has always been shining in the darkness of warfare.

Introducing the content of the present Chapter, LAWS's impact on IHL will be assessed using the following methodology. *First*, LAWS's impact on battlefield will be framed in accordance with Weapons Law (2.2) and Targeting Law (2.3). Such divide is grounded in a two-fold circumstance: on the one hand, it is an accepted distinction in scholarship on IHL; on the other one, it will allow to draw some conclusion on an important aspect of LAWS that remains often untouched in existing literature (2.4). *Second*, we will then consider a key principle of IHL, i.e. the principle of humanity as enshrined in the Martens Clause (2.5). This provision has much in common with the concept of human dignity under IHRL, at least as it acts as a moral modulator in IHL in a way that is not substantially different from human dignity.

2.2 Weapons Law

2.2.1 Overview

There are plenty of IHL norms devoted to regulating the use of weapons in the conduct of hostilities.[226] However, there is surprisingly no agreed definition of the term 'weapon' in international law: while intuitively it can be described as an instrument designed or used for inflicting harm or

[225] Of particular interest in this sense is the contribution of Posner, *A Theory of the Laws of War*, John M. Olin & Economics Working Paper No. 160, 2nd series (2002), 1-24, whose conclusion is that even if humanitarian reasons do not constraint the behavior of States, these actually see an advantage in entering IHL treaties.

[226] Weapons Law is specifically dealt with not only in IHL, but also in other three branches of international law, namely disarmament, arms control and arms trade: see Haines, *The Developing Law of Weapons. Humanity, Distinction and Precautions In Attack*, in Clapham-Gaeta (eds.), *The Oxford Handbook of International Law in Armed Conflict*, Oxford, 2014, 273-295. By the way our focus will be only on IHL.

damage, whether offensively or defensively,[227] no further information is provided both by customary law or treaty law. It is for such reason that the ICRC has claimed that any guidance is to be sought *within* domestic legal orders, and not 'across the international community'.[228] In brief, the various definitions provided by most international actors then to coincide in the sense that they point to two features: (*1*) the capability of directly causing harm as key component; (*2*) the conception of weapons as instruments ('objects') in the hands of their masters ('subjects').

Article 36 of Additional Protocol I to the Geneva Conventions (hereinafter: API) distinguishes among 'weapons', 'means' and 'methods of warfare'. The first two categories – much similar indeed – describe a tool in its own structure, while the last one relates to the manner in which a weapon or a means of warfare is actually used in conflict.[229] 'Weapons' and 'means of warfare' relate to the preliminary question: is the tool *itself* lawful?; 'methods of warfare' relate to the subsequent question: is *the way* in which that tool is employed lawful?[230]

LAWS, as the acronym goes, however are something slightly different from 'weapons' *stricto sensu*: they are 'Weapons Systems', viz. a platform combining one or more weapon(s) and the items associated with its employment.[231] There is thus a noteworthy distinction to be made: on the

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[227] See also *supra* Chapter I.

[228] See ICRC, *A Guide to the Legal Review of New Weapons, Means and Methods of Warfare: Measures to Implement Article 36 of Additional Protocol I of 1977*, Geneva, 2006, at 47.

[229] See Haines, *The Developing Law of Weapons*, cit., at 276: '[t]he term 'weapon' is synonymous with the term 'means' of warfare, although it can be useful to use 'weapon' as a generic descriptor and 'means' as indicating something more specific. (…) [O]ne might define 'weapon' generically as a capability (…) of either destroying or reducing the military effectiveness of the objective (…) 'Means', in contrast, can be used to describe a device, a munition, an implement, a substance, an object, or a piece of equipment'.

[230] See *ibidem*, at 277 (using the example of white phosphorous to show that while lawful as a *means* of warfare designed for illumination or applying heat to something, it may turn unlawful if directly employ against combatants, so as a *method* of warfare).

[231] See Schmitt-Thurner, "*Out of the Loop"*, cit., at 234. Other definitions have been provided for by Liu, *Categorization and Legality of Autonomous and Remote Weapons Systems*, 94 International Review of the Red Cross No. 886 (2012), 627-652, at 635-636; Asaro, *On Banning Autonomous Weapon Systems: Human Rights, Automation, and the Dehumanization of Lethal Decision-making*, 94 International Review of the Red Cross No. 886 (2012), 687-709, at

one end is the weapon (for instance, a machinegun), on the other is the delivery system (the platform), both being inter-independent. For the sake of clarity, consider the *Predator*, a 27-foot unmanned aerial vehicle that meritoriously gained the title of 'queen of America's aerial drone program';[232] originally employed for ISR purposes, it was outfitted with laser-guided *Hellfire* missiles in 1999 and first used for targeted killings the following year.

So there is a weapon to apply force (i.e. the Hellfire missile) and a delivery platform (i.e. the vehicle), which is remotely piloted by a human operator: the 'weapon' or 'means of warfare' is the former, whereas the latter is only instrumental for the delivery of lethal force, and may get relevance if the system as a whole is used in a certain manner (as a 'method of warfare').[233] Thus, if one accepts the abovementioned notion of 'weapon' as a 'tool' in the user's hands, it is implied that the 'tool' includes also the autonomous delivery system as a whole: 'weapon' is a notion that should be understood *broadly*.[234] Having clarified this, it follows that Weapons Law is applicable to LAWS.

690, ftn. 6 (including systems where disparate elements work together without necessarily being attached to each other or co-located, but merely connected through communications links); 'Weapon System', in U.S. DoD, Dictionary of Military Terms, available at the address: http://www.dtic.mil/doctrine/new_pubs/dictionary.pdf (defining it as '[a] combination of one or more weapons with all related equipment, materials, services, personnel, and means of delivery and deployment (if applicable) required for self-sufficiency').

[232] See Marra-McNeal, *Understanding 'the loop'*, cit., at 39.

[233] Another example is the *Taranis*, which is expected to show increased autonomous capabilities in some functions (navigating and, once the technology is ready, selecting and engaging targets): see Cole, *BAE Systems pushing ahead with autonomous drone targeting*, Drone Wars UK, 11 June 2016, available at https://dronewars.net/2016/06/11/bae-systems-pushing-ahead-with-autonomous-drone-targeting/. There again is a weapon and a delivery platform, but once autonomy is associated with selecting and engaging targets, the delivery of lethal force is entrusted to the machine's software, and not a human operator.

[234] This approach to weapon systems is the one adopted by U.S. Directive 3009, cit., and shared by the majority of commentators, irrespective of being in favor or against LAWS. The U.S. DoD has expressly supported this view: see Hays Parks, Office of The Judge Advocate General of the Army, *Weapons Review Program of the United States*, presented at the Expert Meeting on Legal Reviews of Weapons and the SIrUS Project, Joigny sur Vevey, Switzerland, 29-31 January 2001, according to whom the term 'weapon system' refers to

Weapons Law essentially deals with the limitation in the use of weapons in conflict. This idea, yet ancient in history,[235] gained momentum in 1868, when the Saint Petersburg Declaration on explosive projectiles was adopted.[236] The Declaration was signed and ratified/acceded by 20 States,[237] and, albeit void of binding effect, represented an historical attempt to limit the use of weapons between belligerent States. Small explosive rifle projectiles had proven their worth against objects, but when used against combatants they caused heavier injuries than other types of bullet, equally effective in disabling the enemy.[238] In particular, two foundational points deserve must be highlighted. *First*, in the text of the Declaration it is emphatically stated that 'the progress of *civilization* should have the effect of alleviating as much as possible the calamities of war',[239] thus equating Western progress with *humanization* of warfare (to be reached through prohibition of de-humanizing technology). *Second*, States acknowledged that a certain degree of openness to technological advancements had to be ensured: 'future improvements which science may effect in the armament

'the weapon itself and those components required for its operation, including new, advanced or emerging technologies which may lead to development of weapons or weapon systems and which have significant legal and policy implications. Weapons systems are limited to those components or technologies having direct injury or damaging effect on people or property (including all munitions and technologies such as projectiles, small arms, mines, explosives, and all other devices and technologies that are physically destructive or injury producing)'.

[235] One may recall the example of crossbows as prohibited by the Second Lateran Council; see *amplius supra* Chapter I.

[236] See *supra*.

[237] The last being Estonia, which acceded only in 1991.

[238] See Kalshoven-Zegveld, *Constraints on the Waging of War. An introduction to International Humanitarian Law*, Cambridge, 2011, at 9-10.

[239] See *supra*, italics added.

of troops'[240] will require new declarations, upgrades, modifications, in order to render humanization effective.[241]

An important step in Weapons Law was taken during the two Hague Peace Conferences of 1899 and 1907, when numerous international instruments were adopted to establish further limitations in the choice of weapons. At the 1899 Conference, for instance, a Declaration on asphyxiating gases[242] and a Declaration on expanding – or Dum-Dum – bullets[243] were adopted.

Of paramount importance is the 1907 Hague Convention IV on war on land with its annexed Regulations:[244] here, for the first time, the principle was attached binding force according to which 'the right of belligerents to adopt means of injuring the enemy is *not unlimited*' (Article 22). Limitation is thus recognized as guiding principle in Weapons Law, albeit through a litotes and not explicitly. The list of conventional sources of Weapons Law goes on with the 1907 Hague Convention VIII on naval mines;[245] the 1907

[240] 'The Contracting or Acceding Parties reserve to themselves to come hereafter to an understanding whenever a precise proposition shall be drawn up in view of future improvements which science may effect in the armament of troops, in order to maintain the principles which they have established, and to conciliate the necessities of war with the laws of humanity'.

[241] The Saint Petersburg Declaration is a telling example in this sense: the criterion of 400 grams of weight, initially intended to distinguish infantry-bullets from artillery-ammunition and to outlaw only the former, was later abandoned, once technical change rendered the distinction immaterial. See Henckaerts&Doswald-Beck, *Customary International Humanitarian Law*, Cambridge, 2005, at 273 ff..

[242] Declaration (IV,2) concerning Asphyxiating Gases, adopted in The Hague on 29 July 1899. Contrary to the Saint Petersburg Declaration, the text is far shorter and without emphatic references to 'civilization', 'humanity', and so on.

[243] Declaration (IV,3) concerning Expanding Bullets, adopted in The Hague on 29 July 1899; here a brief reference to the Saint Petersburg Declaration and to its 'sentiment' is present. The term Dum-Dum refers to the Indian arsenal where the bullet was first produced.

[244] Convention (IV) respecting the Laws and Customs of War on Land and its annex: Regulations concerning the Laws and Customs of War on Land, adopted in The Hague on 18 October 1907. With its 9 treaty provisions and 56 regulations, it was at that time the most comprehensive binding instrument of IHL.

[245] Convention (VIII) relative to the Laying of Automatic Submarine Contact Mines, adopted in The Hague on 18 October 1907. Humanitarian imperatives are here intertwined with the principle of the freedom of sea routes for peaceful purposes.

Declaration on projectiles and explosives discharged from balloons;[246] the Geneva Protocol of 1925 against asphyxiating gases.[247] The latter, together with the parallel Declaration of 1899, can be fairly said to having introduced an important principle of Weapons Law, according to which indiscriminate weapons (i.e. whose employment does not allow to distinguish between legitimate and not-legitimate targets) are prohibited.

The 1977 Additional Protocols to the 1949 Geneva Conventions further expanded Weapons Law; in particular, Section I of Part III (arts. 35-42) is dedicated to 'Methods and means of warfare'. Art. 35 ('Basic rules') recalls, in its first paragraph, the wording of Art. 22 of Hague Convention IV, stipulating that 'in any armed conflict, the right of the Parties to the conflict to choose methods and means of warfare is not unlimited'.[248] Paragraph 2 adds: '[i]t is prohibited to employ weapons, projectiles and material and methods of warfare of a nature to cause superfluous injury or unnecessary suffering'. Here again, the provision is partly coincident with another norm, namely Art. 23, lit. e), Hague Convention IV.[249] Paragraph 3 extends the prohibitions to 'methods or means of warfare which are

[246] Declaration (XIV) Prohibiting the Discharge of Projectiles and Explosives from Balloons, adopted in The Hague on 18 October 1907. At the First Hague Conference the prohibition was accepted for a five-year period, and reiterated at the Second Conference until the projected Third Conference, which however never took place.

[247]Protocol for the Prohibition of the Use of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, adopted in Geneva on 17 June 1925. This Protocol aimed at expanding the cited 1899 Declaration in binding terms, as well as other treaty provisions (such as Article 171 of the Treaty of Versailles of 28 June 1919, and Article 5 of the Treaty of Washington relating to the use of Submarines and Noxious Gases in Warfare of 6 February 1922).

[248] The expression 'armed conflict' was absent in the previous provision, and reflects the brand-new approach of IHL to regulating all types of armed conflict, whether international (the so-called 'IAC') and non-international ('NIAC') in character. See *amplius* Kolb, *Advanced Introduction*, cit., 22 ff.. The Commentary to API recalls that the importance of the principle had been reiterated both by the ICRC at its 20th International Conference on 1965 (Resolution XXVIII) and by the UNGA in 1969 (Resolution 2444 (XXIII) of 13 January 1969, entitled *Respect for Human Rights in Armed Conflict*), with slightly divergent wording. See Sandoz-Swinarski-Zimmermann (eds.), *Commentary*, cit., at 390.

[249] 'In addition to the prohibitions provided by special Conventions, it is especially forbidden […] (e) to employ arms, projectiles, or material calculated to cause unnecessary suffering'.

intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment'. Importantly, the following Art. 36 establishes the obligation to review legality during the process of weapons development and procurement, with a view to anticipating unlawful employment of weapons on an *ex ante* rather than *ex post* basis.[250]

Subsequently, it is important to mention the so-called Convention on certain conventional weapons ('CCW'), adopted in the United Nations' framework.[251] It is commonly referred to as an 'umbrella' treaty, since its provisions do not prohibit explicitly the use of specific weapons, which is instead left to the Protocols annexed to the Convention, as of today five.[252] This fragmented approach is supposed to encourage the participation of as many States as possible, leaving them to be free in choosing which Protocols to ratify; in addition, it really makes the CCW a living instrument, capable of adapting to new technologies.[253] Other relevant treaties for Weapons Law are the 1976 ENMOD Convention,[254] the 1997 Ottawa Convention on anti-personnel mines[255] and the more recent 2008 Oslo Convention on cluster munitions,[256] to which the 1972 Convention on Biological Weapons (BWC)[257]

[250] Haines, *The Developing Law of Weapons*, cit., at 285.

[251] Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May be Deemed to be Excessively Injurious or to Have Indiscriminate Effects, adopted in Geneva on 10 October 1980.

[252] They are: Protocol (I) on Non-Detectable Fragments; Protocol (II) on Prohibitions or Restrictions on the Use of Mines, Booby-Traps and Other Devices, as amended on 3 May 1996; Protocol (III) on Prohibitions or Restrictions on the Use of Incendiary Weapons, all adopted on 10 October 1980; Protocol (IV) on Blinding Laser Weapons, adopted on 13 October 1995; Protocol (V) on Explosive Remnants of War, adopted on 28 November 2003.

[253] See Haines, *The Developing Law of Weapons*, cit., at 281.

[254] Convention on the prohibition of military or any hostile use of environmental modification techniques, adopted on 10 December 1976

[255] Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction, adopted on 18 September 1997.

[256] Convention on Cluster Munitions, adopted on 30 May 2008.

[257] Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction, opened for signature at London, Moscow and Washington on 10 April 1972.

and the 1993 Convention on Chemical Weapons (CWC)[258] can be added, at least according to some.[259]

To sum up, it has emerged that as a branch of IHL Weapons Law's main purpose is to restrain the use of weapons, means and methods of warfare, its rationale being enshrined in the basic, ancient principle of *limitation* of their choice (Arts. 22 Hague Convention IV; 35 API). This idea of limitation directly stems from, as often said, the necessity of mitigating the perverse effects of warfare on humanity: in other words, in an attempt to *humanize* it.[260] For our purposes, attention must be paid to weapons, means and methods of warfare that cause superfluous injury and unnecessary suffering (2.2.2), and are indiscriminate in nature (2.2.3).[261]

2.2.2 Prohibition of Weapons Causing Unnecessary Suffering and Superfluous Injury

Arts. 23 (e), Hague Convention IV, and 35.2, API, prohibit the use of weapons that cause superfluous injury and unnecessary suffering (in short, 'SIrUS').[262] It is a prohibition that, in addition to being enshrined in most

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[258] Convention on the prohibition of the development, production, stockpiling and use of chemical weapons and on their destruction, adopted in Paris on 13 January 1993.

[259] For instance, it can be observed that the BWC only concerns the development of such weapons, and not their employment: this should make it a disarmament Convention, and not properly a IHL Convention.

[260] This idea inspired the Saint Petersburg Declaration and the Russian Empire, under whose auspices the International Military Commission was convened that adopted the Declaration. As the document circulated by Russia among its Representatives in European States says, '[s]i la guerre est un mal inevitable, on doit cependant chercher à en diminuer les cruatés autant que possible, et c'est pourquoi il n'y a pas lieu d'introduire des armes meutrières qui ne peuvent qu'aggraver les calamites, sans avantage aucun pour le but direct de la guerre' ; quoted in Benvenuti, *La Clausola Martens e la tradizione classica del diritto naturale nella codificazione del diritto dei conflitti armati*, in AA.VV., *Scritti degli allievi in memoria di Giuseppe Barile*, Padua, 1995, 173-224, at 210, ftn. 79.

[261] The other categories of weapons, means and methods of warfare proscribed by treaty law are: those that affect sensibly the environment; those that are expressly prohibited by international law. We will skip these two categories, as the first is of little to no relevance for our analysis, and the second clearly does not attach as today no international instrument exists that prohibits LAWS.

[262] The acronym has been formally adopted by the ICRC for a project, initiated in 1999, whose purpose was to study the impact of weapons through the lens of SIrUS; see

Weapons Law treaties, has gained customary status.[263] The ICJ has even defined it as one of the 'cardinal principles' of the entire IHL.[264] The broad acceptance of this rule is counterbalanced by diverging views on the content of the prohibition.[265] There are four aspects that are of particular importance in view of testing LAWS's compatibility with this rule.

First, the notion of SIrUS is ultimately based on disproportion. Intuitively, if superfluous and unnecessary harm is banned, it is implied that there are some forms of necessary harm which are allowed. The mere fact of causing harm to the enemy does not *per se* fall within the prohibition; it so does when it exceeds a threshold. This threshold can be traced in *military necessity*: if SIrUS do not serve any military purpose, weapons causing them are unlawful.[266] Military necessity is however a notion to be handled with care, lest any employment of violence on battlefield be justified for its military-political purposes, and the whole idea of IHL as limitation simply fade away.[267] The factor that can counterbalance – and

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Coupland-Herby, *Review of the Legality of Weapons: A New Approach, the SIrUS Project*, 81 International Review of the Red Cross No. 835 (1999), 583-592.

[263] See Henckaerts&Doswald-Beck, *Customary International Humanitarian Law*, cit., *Rule 70*, at 239; see also IMT, *The Nuremberg Judgment*, reprinted in Friedman (ed.), *The Law Of War: A Documentary History*, 1972, 922-961; *Report of the Secretary-General Pursuant to Paragraph 2 of the Security Council Resolution 808*, § 35, U.N. SCOR, U.N. Doc. S/25704 (1993).

[264] ICJ, *Nuclear Weapons case*, cit., § 78.

[265] See Henckaerts&Doswald-Beck, *Customary International Humanitarian Law*, cit., *Rule 70*, at 242-243 (with thorough reference to State practice); for the debate on the content and scope thereof, see *amplius* Cassese, *Weapons Causing Unnecessary Suffering: Are They Prohibited?*, 58 Rivista Italiana di Diritto Internazionale (1975), 12-42 (commenting on Art. 23 (e) of Hague Convention IV). For a critical appraisal of the rule, see Corn-Blank-Jenks-Talbot Jensen, *Belligerent Targeting and the Invalidity of a Least Harmful Means Rule*, 89 International Law Studies (2013), 536-626.

[266] See Carnahan, *Unnecessary Suffering, the Red Cross and Tactical Laser Weapons*, 18 Loyola International and Comparative Law Review No. 4 (1996), 705-732, at 712-713; less recently, see also McDougal-Feliciano, *Law and Minimum World Public Order: The Regulation of International Coercion*, 1961, London-New Haven, at 616 (according to whom the prohibition covers 'gratuitous violence which serves no military end').

[267] See Blishchenko, *Les principes de droit international humanitaire*, in Swinarski (ed.), cit., 291-300, in particular at 298 (according to whom military necessity is a notion heavily abused by imperialist State to justify their cruelty). An however positive take on humanity as a restraining force is that of Cameron, *The limitations on methods and means of warfare*, 9 Australian Yearbook of International Law (1985), 241-270, at 256 (claiming that even though violence is part and parcel of warfare, excessive violence transforms it in savagery,

restrain – military necessity is the humanitarian purpose of IHL rules, which respond to the principle of humanity (to which we will come back later on).[268] The combination of these two opposing forces results in a threshold of harm that weapons are allowed to lawfully cause in warfare; in other words, it is a matter of *proportionality* between harm and anticipated military gain.[269] The ICJ has notoriously taken this approach in the *Nuclear Weapons* case.[270] Conversely, according to others, the test for determining whether a weapon causes SIrUS should consist in a comparison with weapons already object of a specific ban: if their effects are analogous, correctly the former should be prohibited, as to say, *per relationem*.[271] This

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which is what modern IHL aim to avoid); on the contrary, see Schwarzenberger, *The law of armed conflict: A civilized interlude*?, 28 Yearbook of World Affairs (1974), 293-309 (showing skepticism on the real possibility for humanitarian purposes to restrain 'the supremacy of force in time of war'). The view according to which military necessity cannot justify whatever violation of law has been officially acknowledged by the U.S. Military Tribunal in Nuremberg; see IMT, *United States v. List (Wilhelm) and Others (Case No. 7)*, Trial Judgment, 19 February 1948 ('military necessity or expediency do not justify a violation of positive rules').

[268] See Sitaropoulos, *Weapons and Superfluous Injury or Unnecessary Suffering in International Humanitarian Law: Human Pain in Time of War and the Limits of Law*, 54 Revue Hellenique de Droit International (2001), 71-108, in particular at 76; Blishchenko, *Le principe*, cit., at 293 (claiming that humanity is 'le principal et le plus ancien' amongst IHL principles); the idea is however present in almost every IHL treaty (recall for instance the Saint Petersburg Declaration of 1868, who expressly refers to the '*conciliation* of the necessities of war with the laws of humanity', *italics mine*).

[269] See for instance Art. 3 par. 3(c) of Protocol (II) to the CCW, which refers to 'concrete and direct military advantage anticipated'. Several Military Manuals adopt the same view when tackling the issue of SIrUS; see *inter alios* the Military Manual of the Federal Republic of Germany, August 1992, § 402 (''Superfluous injury' or 'unnecessary suffering' is caused by the use of means and methods of combat whose presumable harm would definitely be excessive in relation to the lawful military advantage intended'); U.S. DoD Law of War Manual, June 2015, particularly at § 6.6.3 (arguing that a weapon 'is only prohibited by the superfluous injury rule if the suffering it inflicts is clearly disproportionate to its military utility' and noting that because of the difficulty of comparing those two values prohibition is established only in cases of manifest disproportion); see also the U.S. Air Force Manual, November 1976, § 6 (underlining that 'the critical factor in the prohibition against unnecessary suffering is whether the suffering is needless or disproportionate to the military advantages secured by the weapon, *not the degree of suffering itself*', italics mine).

[270] ICJ, *Nuclear Weapons case*, cit., § 78: unnecessary suffering is here described as 'harm greater than that unavoidable to achieve legitimate military objectives'.

[271] This approach naturally tends to give value to State practice with respect to certain weapons. See Henckaerts&Doswald-Beck, *Customary International Humanitarian Law*, cit., *Rule 70*, at 242-243 (citing the Military Manuals of Argentina and the U.S. as examples). See

'osmotic' prohibition was defended, *inter alia*, by Japan in a protest lodged in 1945 against the U.S. for the nuclear bombings of Hiroshima and Nagasaki;[272] but an important judgment delivered by the District Court of Tokyo in the *Shimoda* case some years after seems to depart from this approach, attaching more importance to the proportionality criterion as construed above.[273]

Second, SIrUS relates to the inevitability of death or serious permanent disability as results from a particular use of force. If a weapon is of a nature that renders death or lasting incapacity the inescapable consequence of its use, then it is unlawful.[274] Death or incapacity must be an *accidental* effect of the weapon, and not its essential one.[275] Through the lens of this second aspect, one can see better the reason why poison and

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also the U.S. *Memorandum of Law on Sniper use of Open-Tip Ammunitions*, 1990, in *U.S. Practice Report*, ICRC Study, Annex 3-14, at 3: '[i]n conducting the balancing test necessary to determine a weapon's legality, the effects of a weapon cannot be viewed in isolation. They must be examined against *comparable weapons in use on the modern battlefield*', italics mine.

[272] See Cassese, *Weapons Causing Unnecessary Suffering*, cit., at 30 (recalling the statement of Japan, according to which 'the bomb […] far exceeds, in its indiscriminate performance and its atrocious character, poisonous gases and other weapons which hitherto have been banned because they possess these performances').

[273] *Ibidem*; see also Sitaropoulos, *Weapons and Superfluous Injury*, cit., at 81. In the judgment's words, 'however great the inhumane result of a weapon may be, the use of the weapon is not prohibited by international law, if it has a great military efficacy'.

[274] See the Preamble of Saint Petersburg Declaration, cit.. See also the remarks of the Russian Delegate to the 1899 Hague Conference when discussing the Declaration prohibiting asphyxiating or deleterious gases, in *The Proceedings of the Hague Conference*, Translation of the Official Texts prepared under the supervision of Scott, *The Conference of 1899*, 1920, at 283: '[a]sphyxiating gases (…) would exterminate the whole crew [of a vessel]. This procedure would therefore be contrary to the humane idea which ought to guide us, namely, that of finding means of *putting enemies out of action without putting them out of the world*' (italics mine). The goal of SIrUS project was to lay down, as far as possible, objective, health-base criteria for assessing the degree of harm caused by a weapon and its consequent legality; see Sitaropoulos, *Weapons and Superfluous Injury*, cit., at 84.

[275] In Cassese's words: 'a weapon is legitimate if, by striking the adversary, it can either kill or wound him, depending on the circumstances. By contrast, it is not in keeping with international law if it *always* results in *killing all* persons who in some way happen to be struck by it'; see Cassese, *Weapons Causing Unnecessary Suffering*, cit., at 18.

expanding bullets, as well as blinding lasers and anti-personnel landmines, have been all outlawed.[276]

A *third* aspect is the availability of alternative means of warfare, military advantage being equal: on this condition States should resort to less injuring weapons.[277] On this point there actually is little to no State practice.

Fourth, SIrUS have to be assessed against the *nature* of the weapon (as expressly enshrined in ICRC's Customary Rule 70):[278] it follows that what matters is the design of a weapon, its normal use, and not any possible use that can be made of such weapon. For instance, even a rifle, i.e. a weapon whose lawfulness is undisputed, can be used to blow an enemy combatant leg by leg, letting him die slowly or so as to permanently disable him. This is not however the result of the rifle's design (thus normal use), rather of a particularly cruel employment of the weapon.

To sum up, the use of weapons that cause SIrUS is prohibited by conventional and customary Weapons Law as long as: (*1*) SIrUS are disproportionate with respect to military necessity (as a manifestation of the principle of humanity that requires restraint in warfare); (*2*) death and permanent disability are the inevitable consequence of their use; (*3*) less harmful alternatives are viable. The normal use of the weapon, according to its design, is the only one relevant to the purpose of this assessment. Because of the great difficulty that one encounters in calculating all the factors above, and the inherent subjectivity and context-relatedness of this assessment, many consider the principle as being essentially *pointless*.[279] In

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[276] See Henckaerts&Doswald-Beck, *Customary International Humanitarian Law*, cit., *Rule 70*, at 243-244, with broad reference to national Military Manuals.

[277] See Carnahan, *Unnecessary Suffering*, cit., at 722 (citing projectiles filled with glass or non-detectable fragments).

[278] Henckaerts&Doswald-Beck, *Customary International Humanitarian Law*, cit., *Rule 70*, at 243-244 ('[t]he use of means and methods of warfare which are *of a nature* to cause superfluous injury or unnecessary suffering is prohibited', italics mine).

[279] This conclusion is supported by Cassese, *Weapons Causing*, cit., *passim* (making an in-depth analysis of relevant practice and concluding that, in accordance with the general interpretive principle expressed in the maxim *ut res magis valeat quam pereat*, the principle of SIrUS can maintain a value, albeit limited, in exceptional cases, where abhorrent weapons are at issue); see also Sitaropoulos, *Weapons and Superfluous Injury*, cit., at 81

short, in order to achieve the result of terminating or avoiding the use of a particular weapon the best strategy would be to put a specific ban on it rather than relying on the general prohibition against weapons causing SIrUS.[280] Be as it may, the customary nature of the provision is beyond question, as well as its acknowledged status of 'cardinal principle' of IHL.

Turning now to LAWS's compatibility with the SIrUS rule, it must be assessed whether LAWS are *inherently* suitable for causing such harm. Their supporters basically contend that this is not the case, since their salient feature – being able to deliver lethal force autonomously – 'has no direct bearing' on the prohibition, adding that '[i]ndividual systems could be developed that would violate these norms, but autonomous weapon systems are not prohibited on this basis *as a category*'.[281] If LAWS were equipped with guns shooting expanding bullets, *these* would be unlawful, not the delivery system as such. By contrast, if LAWS were equipped with lawful weapons, then the SIrUS rule could not attach. Bearing in mind that it is LAWS *as a whole*, viz. as combining 'lethality' and 'autonomy', what really matters, one may question whether it is the very fact that a machine exerts lethal force independently of a human operator which renders the weapon unlawful.

Considering the third aspect of the SIrUS rule (i.e. that available alternatives posing less risks should be preferred), if there is no alternative, equally feasible and advantageous means, LAWS can be lawfully chosen. As for the second aspect (not rendering death or permanent disability inevitable), the prohibition would cover LAWS programmed to select and attack targets but prevented from carrying out a context-related, *hic et nunc* assessment of the target.[282] Last, the aspect of proportionality with the anticipated military advantage has to be addressed. If the degree of SIrUS

(commenting again on State practice and noting that no weapon has ever been banned only by virtue of the principle of SIrUS).

[280] This is also the view of Meron, *The Humanization of International Law*, The Hague, 2006, at 72.

[281] See Schmitt-Thurner, *"Out of the Loop"*, cit., at 279, italics mine.

[282] We will turn to this aspect later when discussing Targeting Law; see *infra*, 2.3.

cannot be assessed statically but only dynamically (i.e. considering the gain in military terms), and if the SIrUS rule has to be conceived as the materialization of the principle of humanity, then the underlying question must be rephrased as follows: can the fact that lethal force is delivered by a machine without human intervention be justified under the principle of military necessity? Or is the principle of humanity, as the one inspiring the prohibition on weapons causing SIrUS, so much overwhelming not to be balanced against military necessity?

The discussion on the admissibility of LAWS depends, *inter alia*, on the very answer one gives to this question; but answering such question entails a correct understanding of the notion of humanity, which will be tackled *infra*. For the purposes of SIrUS, and taking into account its development in the history of Weapons Law, it does not seem that LAWS contrast *as such* with this rule.

2.2.3 Prohibition of Indiscriminate Weapons

If the first core provision of Weapons Law deals with the *degree* of harm that can be caused to a human target, the second deals with the *way* such target is selected. Weapons Law establishes that weapons that cannot distinguish between permissible and non-permissible targets are prohibited. This rule, whose first formulation dates back to the 1899 Hague Conference,[283] has been codified, *inter alia*,[284] by Art. 51, par. 4, litt. (b) and (c), API, and now enjoys both conventional and customary status.[285] These provisions

[283] See Cassese, *The Prohibition of Indiscriminate Means of Warfare*, in Gaeta-Zappalà (eds.), *The Human Dimension of International Law*, Oxford, 2008, 172-191, at 174-175 (recalling the views expressed by several Delegations during the 1899 Peace Conference, among which those of Denmark and the Netherlands contending that asphyxiating gases 'endanger the existence of a large number of noncombatants, for instance, in case of a siege' and 'if directed against a besieged city, they would perhaps hit more harmless inhabitants than the ordinary projectiles').

[284] See also Art. 8, par. 2, (b) of ICC Statute; Art. 1, par. 2, of Protocol II to CCW; Preamble of the Ottawa Convention, all cit..

[285] As observed by Haines, *The Developing Law*, cit., at 282-283, there is a contrast between those who claim that Art. 51, par. 4, API was the very first provision to prohibit indiscriminate weapons, since no such rule existed both in conventional and customary

respectively establish that methods or means of warfare 'which cannot be directed at a specific military objective' and 'the effects of which cannot be limited' constitute 'indiscriminate attacks' and are consequently prohibited. The *sedes materiae* can be surprising, because these provisions are inserted in API's Part IV (dedicated to 'Civilian Population') and resemble more targeting rules than Weapons Law's norms; however, they clearly concern 'methods and means of combat', thus falling within the scope of Weapons Law.[286]

According to the first element – possibility of direction toward specific target – a famous example of indiscriminate weapons are the so-called 'blind' weapons, i.e. those lacking precision so much that they cannot be aimed at any specific target. For instance, one can recall the German V.1 and V.2 used during World War II, whose inaccuracy equated their use (especially against United Kingdom) to the deliberate targeting of civilians.[287] Landmines and cluster munitions are telling examples too.[288] As for the second element – possibility of limiting the effects of a weapon – it refers directly to the consequences that the use of a weapon produces on the civilian population. Biological and chemical weapons have been condemned because of the uncontrollability and unpredictability of their

law prior to its entry into force (he cites Boothby, *Weapons and the Law of Armed Conflict*, Oxford, 2009, at 75), and those who contend that a prior customary rule was in place, and Art. 51, par. 4, API only translated it into a conventional rule (Cassese, *The Prohibition*, cit.).

[286] As a matter of fact, the ICRC considers the prohibition as customary both under Rule 71 (contained in Chapter 20, 'General Principles on the Use of Weapons') and Rules 11-12 (contained in Chapter 3, 'Indiscriminate Attacks'), which are strictly interrelated; see Henckaerts&Doswald-Beck, *Customary International Humanitarian Law*, cit., *Rule 71*, at 247. See also Boothby, *Weapons and the Law*, cit., at 67 (outlining the distinction between principles of Targeting Law and the rule of indiscriminateness for Weapons Law purposes).

[287] See Cassese, *The Prohibition*, cit., at 173 (recalling State practice on the issue, and especially citing a statement made by Churchill in 1944 condemning the use of such weapons as 'indiscriminate in its nature, purpose and effect').

[288] In the Preamble of both Conventions, reference to the principle of distinction between military and civilian targets is present.

effects;[289] the idea is also present in the Dissenting Opinions appended to the *Nuclear Weapons* case.[290]

Analogously to SIrUS the test for indiscriminateness involves the *nature* of the weapon, i.e. its normal use, and not any possible (ab)use thereof (that is, their potential indiscriminateness).[291] In addition, the vagueness of the rule is believed not to make it possible to consider a weapon unlawful without specific prohibition: in this sense state practice is ambiguous.[292]

Testing LAWS against this rule, it is commonly said that their autonomy 'does not preclude them from being directed at combatants and military objectives, and need not result in their having effects that an attacker cannot control'.[293] Supporters of LAWS claim that their ability to discriminate depends, *inter alia*, on system's algorithms, processing capabilities, and the environment they are fielded in.[294] Here is we call

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[289] See UNGA, Resolution 2603 A (XXIV).

[290] See Henckaerts&Doswald-Beck, *Customary International Humanitarian Law*, cit., *Rule 71*, at 248 (noting that the judges referred to the widespread destruction caused by the weapon both in time and in space, yet without providing for a specific definition).

[291] As an application of the rule, see International Criminal Tribunal for the Former Yugoslavia (ICTY), *Prosecutor v. Martić*, Trial Judgment, 12 June 2007, §§ 462-463 (discussing the use by Serb forces of an unguided projectile containing a cluster warhead of 288 bomblets, with each bomblet containing 420 pellets of 3mm in diameter and concluding that by virtue both of its being unguided and its firing at the maximum range, that particular weapons was to be considered indiscriminate and thus illegal). See also Boothby, *Weapons and the Law*, cit., at 69 (noting that what is relevant is the nature of the weapon, and, taking the case of cluster munitions, *a contrario* a treaty ban would have been superfluous, since they would have been covered by the already existing prohibition enshrined in Art. 51, par. 4, API).

[292] See Henckaerts&Doswald-Beck, *Customary International Humanitarian Law*, cit., *Rule 71*, at 249-250. The same view is taken by Cassese, *The Prohibition*, cit., at 182-183 (arguing that, if it is undeniable that weapons causing 'indiscriminate suffering' are believed to be contrary to international law by many States, there is little to no State practice where protests against those weapons are repeated and thus far there is no State that has come to discontinue the use of such weapons as a result of allegations by other States about their indiscriminateness).

[293] See Schmitt, *"Out of the loop"*, cit., at 279.

[294] See Schmitt-Widmar, *'On Target': Precision and Balance in the Contemporary Law of Targeting*, 75 Journal of National Security Law & Policy No. 3 (2014), 379-409, particularly at 398-399 (arguing that 'the proper question is not whether [LAWS] are unlawful *per se*,

'technological objection': if technology is developed that ensures adequate capabilities of discriminating and controlling the effects of a weapon, then nothing could (and should) halt the adoption of the weapon. So, the development of LAWS endowed with 'strong A.I.' capabilities (*rectius*: 'sufficient' A.I. capabilities) that allow its user to direct the weapon against specific targets (selected through a plethora of sensors ensuring levels of thoroughness simply unreachable to humans) and to control its effects (through override mechanisms to prevent the machine from an implausible 'going rough') must be considered consistent with the rule under consideration. As most supporters of LAWS claim, what should be asked to the machine is to perform *at least* as well as human warfighters.[295]

It follows that the prohibition on indiscriminate weapons in itself does not include LAWS as long as technologically-compliant with the rule, in perfect analogy with SIrUS.

2.2.4 The Obligation to Conduct a Legal Review

If considered a weapon, LAWS are thus subject to the legal review mechanism as envisaged by Art. 36 API, a treaty provision (however recognized as customary)[296] that appears extremely appropriate for such futuristic weapons as it addresses 'new weapons'. In the 'study, development, acquisition or adoption' (viz., throughout the entire process, from laboratory to field) thereof, States have a duty to conduct a review aiming at assessing the compatibility of the weapon's employment, 'in some

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but rather whether their use in a particular environment and combat context will meet IHL requirements).

[295] In this sense, see Arkin, *The Case for Ethical Autonomy in Unmanned Systems*, 9 Journal of Military Ethics No. 4 (2010), 332-341.

[296] See *ex multis* Blake-Imburgia, *'Bloodless Weapons'? The Need to Conduct Legal Reviews of Certain Capabilities and the Implications of Defining Them as 'Weapons'*, 66 THE AIR FORCE LAW REVIEW (2010), 157-203, at 163-166; for an insight in State practice, see Daoust-Coupland-Ishoey, *New wars, new weapons? The obligation of States to assess the legality of means and methods of warfare*, 84 International Review of the Red Cross No. 846 (2002), 345-362, particularly at 354-360.

or all circumstances', with existing applicable norms.[297] The fact that LAWS *in itself* have an offensive capability that can be applied to the designed target thus renders them the object of Art. 36's legal review: applied to critical functions, LAWS's autonomy is as a matter of fact 'integral part of the targeting decision process' and the major driver for exerting lethal force in battlespace.[298]

Art. 36 API's obligations encompass the duty to adopt national implementing measures; the content and scope of such measures are however left to each State.[299] Legal reviews are thus a *domestic* process. As a matter of fact, they should be conducted in a manner that ensures the application of Weapons Law to the weapon being assessed, namely of the general prohibitions of weapons causing SIrUS, of indiscriminate weapons, of those particularly affecting the environment and of specific prohibitions.[300] States are obliged to review not only 'future' weapons, but also existing weapons if modified after an initial review or however upgraded in their functions.[301]

Art. 36 is commonly considered as the sole 'link' between API's provisions and the introduction of a new weapon by a State;[302] it would be more correct, however, to highlight that it may be the only explicit or positive link, as new technology has always been taken into consideration in developing IHL.[303] The Commentary itself, in a section dedicated to

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[297] The U.S. DoD expressly support the view that weapon systems are 'weapon' thus subject to legal review; see Hays Parks, cit..

[298] See *amplius* McClelland, *The review of new weapons in accordance with Article 36 of Additional Protocol I*, 85 International Review of the Red Cross (2003), 397-415, at 404 (claiming that on such basis 'tactics, techniques and procedures adopted by armed forces' escape Art. 36's reach).

[299] See Daoust-Coupland-Ishoey, *New wars, new weapons?*, cit., at 347.

[300] See ICRC, *A Guide to the Legal Review of New Weapons*, cit., at 10-17.

[301] Daoust-Coupland-Ishoey, *New wars, new weapons?*, cit., at 352.

[302] See Sandoz-Swinarski-Zimmermann (eds.), *Commentary*, cit., at 421-423 (recalling the different positions expressed at the Conference regarding the establishment of an *ad hoc* supervisory body, which never occurred).

[303] See *ex multis* the Preamble of Saint Petersburg Declaration, cit. ('[t]he Contracting or Acceding Parties reserve to themselves to come hereafter to an understanding whenever a precise proposition shall be drawn up in view of future improvements which science may

'future arms',[304] interestingly expresses 'prescient concern over automation of the battlefield',[305] warning that: '[t]he use of long distance, remote control weapons, or weapons connected to sensors positioned in the field, leads to the automation of battlefield *in which the soldier plays an increasingly less important role*'.[306]

According to current policies on LAWS, that LAWS must make the object of Art. 36' mechanism is acknowledged by, *inter alios*, the U.K.,[307] the U.S.,[308] and the ICRC.[309] As is for other weapons, the review of LAWS has to take place throughout their development. In particular, it must be ascertained whether and to what extent the use LAWS can comply with 'cardinal provisions' of IHL. If the approach is exclusively technology-based, then the inevitable conclusion is that LAWS will sooner or later pass the test. There is another aspect to be taken into consideration, though.

In discussing prohibitions and restriction based on customary and conventional weapons law the ICRC's *Guide to the Legal Review of New Weapons* concludes with a short paragraph dedicated to 'Prohibitions or restrictions based on the principles of humanity and the dictates of public conscience (the 'Martens clause')'.[310] According to the humanitarian institution, the Martens clause, as formulated in Art. 1, par. 2, API and in previous IHL instrument, by virtue of the protection it accords to civilians and combatants 'in cases not covered by [API] or by other international agreements',[311] can be employed as a basis for considering a weapon

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effect in the armament of troops, in order to maintain the principles which they have established, and to conciliate the necessities of war with the laws of humanity').

[304] Sandoz-Swinarski-Zimmermann (eds.), *Commentary*, cit., at 427-428.

[305] The expression is quoted from Blake-Imburgia, *'Bloodless Weapons'?*, cit., at 169.

[306] Sandoz-Swinarski-Zimmermann (eds.), *Commentary*, cit., at 427-428, italics mine.

[307] See ICRC 2014 Report, cit., at 19.

[308] *Ibidem*.

[309] *Ibidem*, at 20: '[t]here was no doubt that the development and use of autonomous weapon systems in armed conflict is governed IHL, including the obligation to undertake legal reviews in the study, development, acquisition or adoption of new weapons, as required by Article 36 of Additional Protocol I to the Geneva Conventions (API) and implemented by some States not party to API'.

[310] ICRC, *A Guide to the Legal Review of New Weapons*, cit., at 17.

[311] See Art. 1, par. 2, API. On the Martens Clause, see *amplius infra* 2.5.

unlawful.[312] It follows that if LAWS, inasmuch as weapons combining for the first time 'lethality' and 'autonomy', were found to be contrary of those 'principles of humanity and dictates of public conscience', then they could not pass the legal review according to Art. 36 API. As will be better explained in the following, the ICJ has no doubt about the customary nature of Martens clause,[313] which makes this relevant to Art. 36's analysis.

In conclusion, it emerges clearly from the foregoing that if analyzed only through the lens of their technology, LAWS are not as such in contrast with Weapons Law. First, they are not likely to cause more SIrUS than other comparable weapons; second, they are not inherently indiscriminate; third, they are unquestionably subject to legal review. The 'technological objection' which today inspires most supporters of a ban on LAWS is quite easy to rebut: sooner or later, technology will be advanced enough to make LAWS fully compliant with Weapons Law provisions. As that day comes, the heralds of 'the-sky-is-falling' paradigm will find themselves with no argument to raise to their opponent. The only argument that could play, so to speak, a 'killjoy' role is 'humanity'. This appears as a powerfully restraining principle, which not only tempers the imperatives of military necessity (as it was in the SIrUS rule) but also influences Art. 36's legal reviews. Yet, it is still unclear what this notion entails, and thus whether it has sufficient legal force to be used against new technologies. Before addressing the issue, however, LAWS must be assessed also through the lenses of Targeting Law.

2.3 Targeting Law

2.3.1 Overview

[312] 'A weapon which is not covered by existing rules of international humanitarian law would be considered contrary to the Martens clause if it is determined per se to contravene the principles of humanity or the dictates of public conscience'; see ICRC, *A Guide to the Legal Review of New Weapons*, cit., at 17.
[313] See ICJ, *Nuclear Weapons*, cit., § 87.

Targeting Law addresses the issue of how (lawful) weapons may be lawfully used in attacks: it focuses not on the instrument employed to exert lethal force but on its user. Generally speaking, Targeting Law is inspired by the very same idea of *limitation* encountered in Weapons Law: the right of the parties to a conflict to attack each other is not unlimited.

In particular, IHL establishes rules of conduct for those entitled to use lethal force *in bello*. Targeting Law, in other words, posits the inherent autonomy of combatants, i.e. 'the ability to observe, reflect and choose a course of action'.[314] This is why IHL requires States: (*i*) to train members of their armed forces with a view to disseminating the Geneva Conventions and customary norms 'as wide as possible';[315] (*ii*) to punish (or extradite) those responsible for violating some of these provisions.[316]

Discussing whether LAWS themselves could be the addressees of Targeting Law, most would answer in the negative: assuming that they are 'weapon systems' as the acronym goes, they fall into the category of 'tools', 'instruments' in the hands of 'users', their 'masters'. According to some, however, it is in fact far from nonsensical to draw an analogy between LAWS and combatants. For instance, it is argued that LAWS endowed with advanced autonomous capabilities cease to be a 'weapon' (thus subject to Art. 36 API assessment as explained above) and transform 'into a 'robo-combatant''.[317] A weapon does not decide when and against whom to shoot

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[314] See in particular Crotoof, *Autonomous Weapon Systems and The Limits of Analogy*, 9 Harvard National Security Journal (2018), 52-83, at 65 (describing essential features of combatants with a view to showing that most analogies that are proposed between LAWS and other 'agents' – in particular combatants – end up being unable to provide a clear framework of analysis).

[315] See Geneva Convention (I), cit., Art. 47; Convention (II), cit., Art. 48; Convention (III), cit., Art. 127; Convention (IV), cit., Art. 144; API, cit., Art. 83; APII, cit., Art. 19. The obligation to disseminate IHL provisions has gained customary status; see Henckaerts&Doswald-Beck, *Customary International Humanitarian Law*, cit., *Rule 142* and *Rule 143*.

[316] See Convention (I), Art. 49; Convention (II), Art. 50; Convention (III), Art. 129; Convention (IV), Art. 146; again, the rule is now customary in nature, as explained in Henckaerts&Doswald-Beck, *Customary International Humanitarian Law*, cit., *Rule 158*.

[317] See Chengeta, *Are Autonomous Weapon Systems the subject of Article 36 of Additional Protocol I to the Geneva Conventions?*, 23 JOURNAL OF INTERNATIONAL LAW & POLICY No. 1 (2016), at 77.

– these are its master's calls. So LAWS capable of selecting and engaging targets simply *replicate* a soldier's decision-making process. In OODA Loop terms, it is up to them to perform the whole chain, their operator retaining little to no authority over the single decision. The analogy with combatants has however received some critiques, and been considered as inaccurate,[318] or discarded on the grounds of being pointless for a discussion on the topic.[319]

In any case, it is appropriate to consider LAWS through the lenses of Targeting Law as well: first, current discussions in the international fora have so far attached great importance to this field of IHL; second, should States eventually develop and deploy these weapons, in domestic and international adjudication much consideration will be given to Targeting Law. It therefore makes sense to add its most important principles – namely distinction (2.3.2), proportionality (2.3.3) and precautions in attack (2.3.4) – to our analysis.[320]

2.3.2 Distinction

According to the principle of distinction, parties to an armed conflict must, at all times, distinguish between military personnel and military objects, and civilians and civilian objects; only the former can be directly targeted, whereas the latter enjoy protection from direct attacks.

The principle was first included in the so-called Lieber Code, the set of instructions given to the Union Armies during the American Civil War.[321]

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[318] See Crootof, *Autonomous Weapon Systems and the Limits of Analogy*, cit., *passim*.

[319] See Anderson-Reisner-Waxman, *Adapting the Law of Armed Conflict to Autonomous Weapon Systems*, 90 International Law Studies (2014), 386-411, at 410 (arguing that '[w]hether the actor on the battlefield is a 'who' or a 'what' is not truly the issue, but rather how well that actor performs according to the law of armed conflict').

[320] Other rules may be interested as well by the employment of LAWS, for instance the prohibition on perfidy. On this point, see *amplius* Henderson-den Dulk-Lewis, *Emerging Technology and Perfidy in Armed Conflict*, 91 International Law Studies (2015), 468-485 (concluding that no new rules are required for regulating LAWS, as all that is takes is to re-adapt existing ones).

[321] See the Instructions for the Government of Armies of the United States in the Field, Prepared By Francis Lieber, Promulgated as General Orders No. 100 by President Lincoln,

Traditionally, war was believed to involve all members of the state community, combatants and non-combatants equally;[322] every 'citizen or native' of the opposing party was thus considered as an enemy.[323] Subsequently, this approach was gradually left behind: according to Art. 22 of the Lieber Code, 'as civilization has advanced during the last centuries, so has likewise steadily advanced (…) the distinction between the private individual belonging to a hostile country and the hostile country itself, with its men in arms'.

The principle of distinction was first enounced in the Preamble of the Saint Petersburg Declaration of 1868, which established that, as a result of the 'progress of civilization', State's legitimate object in warfare should be 'to weaken the *military forces* of the enemy'.[324] It follows that those who do not belong to armed forces have to be spared from attacks. The same is at the core of several provisions of the 1899 and 1907 Hague Regulations,[325] as well as of the four Geneva Conventions;[326] it was however only in 1977, when API was adopted, that the principle gained a written formulation. In the words of Art. 48 of API, '… the Parties to the conflict shall at all times distinguish between the civilian population and combatants and between

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24 April 1863. The text is available at the address: https://ihl-databases.icrc.org/ihl/INTRO/110.

[322] This is clearly enshrined in Art. 20 of the Lieber Code: '[p]ublic war is a state of armed hostility between sovereign nations or governments. It is a law and requisite of civilized existence that men live in political, continuous societies, forming organized units, called states or nations, whose *constituents* bear, enjoy, suffer, advance and retrograde *together*, *in peace and in war*', *italics mine*.

[323] See the following Article 21: '[t]he citizen or native of a hostile country is thus an enemy, as one of the constituents of the hostile state or nation, and as such is subjected to the hardships of the war'.

[324] Cit., italics mine.

[325] See for instance Art. 25 of the Hague Regulations of 1899 (annexed to Convention (II) with Respect to the Laws and Customs of War on Land) and the Hague Regulations of 1907 (annexed to Convention IV Respecting the Laws and Customs of War on Land), cit., prohibiting 'the attack or bombardment of towns, villages, habitations or buildings which are not defended'.

[326] See for instance common Art. 3 of the Geneva Conventions, cit. (prohibiting acts of violence against person not (or no longer) taking 'active part in the hostilities, including members of armed forces who have laid down their arms and those placed *hors de combat* by sickness, wounds, detention, or any other cause').

civilian objects and military objectives and accordingly shall direct their operations only against military objectives'.[327] The importance of this principle has been rightly outlined by the ICJ in the *Nuclear Weapons* case, where it was recognized as one of the cardinal principles of IHL.[328] By the same token, the ICRC translated the principle of distinction in the very first of its Customary Rules of IHL.[329]

Assuming that LAWS are capable of resorting to lethal force as combatants would do, they must abide by the distinction rule, and thus be able to properly distinguish between permissible and impermissible targets, either objects or humans.[330] This presupposes that LAWS must be able to assess the *status* of the target before engaging it, an assessment that can be hard to carry out by a machine. For instance, one may consider military objects, defined as 'those objects which by their nature, location, purpose or use make an effective contribution to military action and whose total or partial destruction, capture or neutralization, in the *circumstances ruling at the time*, offers a *definite* military advantage' (Art. 52, par. 2, API).[331] While a military target by 'nature' seems easy to select (e.g., a tank: a LAWS

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[327] See *amplius* Sandoz-Swinarski-Zimmermann (eds.), *Commentary*, cit., at 598 (underscoring the importance of the principle of distinction as the inspiring principle of the 'entire system established in The Hague in 1899 and 1907 and in Geneva from 1864 to 1977').

[328] ICJ, *Nuclear Weapons*, cit., § 78.

[329] Henckaerts&Doswald-Beck, *Customary International Humanitarian Law*, cit., *Rule 1*.

[330] For a general appraisal of the principle of distinction in remote warfare, see Crawford, *The Principle of Distinction and Remote Warfare*, in Ohlin (eds.), *Research Handbook of Remote Warfare*, Cheltenham-Northampton, 2017, 50-78 (explaining the operational differences between targeting objects and targeting humans). Focusing specifically on LAWS, reference can be made to Crootof, *Autonomous Weapon Systems and the Limits of Analogy*, cit., at 56; Boothby, *Autonomous Attack – Opportunity or Spectre?*, 16 YEARBOOK OF INTERNATIONAL HUMANITARIAN LAW (2013), 71-88, in particular 78-79 (outlining the technological challenges to realizing sufficiently efficient machines).

[331] Italics mine. See *amplius* Robertson, *The Principle of the Military Objective in the Law of Armed Conflict*, 8 UNITED STATES AIR FORCE ACADEMY JOURNAL OF LEGAL STUDIES (1997), 35-69, particularly at 56-57 (considering the evolution of the principle and contrasting 'the old-style negative lit of prohibited targets' and 'the new-style permissive principle of defining the military objective'); Byron, *International Humanitarian Law and Bombing Campaigns: Legitimate Military Objectives and Excessive Collateral Damage*, 13 YEARBOOK OF INTERNATIONAL HUMANITARIAN LAW (2010), 183-186 (focusing on energy networks and similar installations); Kolb, *Advanced Introduction*, cit., at 156-165.

need only to be equipped with adequate sensors to distinguish a tank from a civilian car),[332] categories such as 'purpose' or 'use' demand a stronger interpretive effort and an inevitably context-related assessment:[333] LAWS must be endowed with algorithms allowing them to collect and re-elaborate a massive quantity of real-time data. Another key aspect to determine the military value of a target is the 'definite' ('*précis*', in the French version) military advantage resulting from the attack, to be assessed *hic et nunc*: again, a veritable challenge for algorithms.[334] This is why according to some LAWS should be employed only in cluttered, simplified environments where real-time assessments can be made reliably by algorithms.[335]

Things do not substantially change when targets are human. Only combatants (members of the armed forces of a State; participants in a *levée en masse*; militias, volunteer corps and members of movements of

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[332] See Wagner, *Autonomy in the Battlespace: Independently Opeating Weapon Systems and the Law of Armed Conflict*, in Saxon (ed.), *International Humanitarian Law and the Challenging Technology of Warfare*, Leiden, 2013, 99-122, at 113 (arguing for the feasibility of programming the rudimentary characteristics of objects into machines).

[333] A recent example is the arbitral decision taken by the Eritrea-Ethiopia Claims Commission in the *Western Front* case. The Commission dealt *inter alia* with the aerial bombardment of the Hirgigo Power Station, which had been considered by the attacking party (Ethiopia) and was then considered by arbitral body as 'military object' in API's meaning since even though electricity production had not yet started, it was intended that the Eritrean army would benefit from it; see *Eritrea-Ethiopia Claims Commission - Partial Award: Western Front, Aerial Bombardment and Related Claims - Eritrea's Claims 1, 3, 5, 9-13, 14, 21, 25 & 26*, in *Reports of International Arbitral Awards, vol. XXVI, pp. 291-349, 19 December 2005*, § 119-120. Or consider the difficulty in adequately assessing the military relevance of dual-use objects, i.e. those serving at once civilian and military purposes

[334] See Wagner, *Autonomy in the Battlespace*, cit., at 113 (discussing existing technology's feature and commenting on the level of discrimination capabilities required for future machines).

[335] See *ex multis* Sassoli, *Can Autonomous Weapon Systems Respect The Principles Of Distinction, Proportionality and Precautions*?, Speaker's summary in ICRC Expert Meeting on *Autonomous Weapon Systems: Technical, Military, Legal and Humanitarian Aspects*, Geneva, 26-28 March 2014, 41-43; and id., *Autonomous Weapons and International Humanitarian Law: Advantages, Open Technical Questions and Legal Issues to be Clarified*, 90 INTERNATIONAL LAW STUDIES (2014), 308-340. See also ICRC 2014 Report, cit., at 78 ('current fixed autonomous weapon systems used in narrow roles and operating in relatively static, low clutter environments can be programmed to distinguish simple objects'); UK Ministry of Defence, *Joint Doctrine Note 2/11*, cit., § 508 (contending that in not-complex environments 'a degree of autonomous operation is probably achievable now and data from programmes such as Brimstone and ALARM, for example, would have direct read-across').

resistance)[336] or civilians directly participating in hostilities[337] can be targeted; on the contrary, belligerents who are *hors de combat* (e.g. having been injured, or having manifested a clear intention to surrender) 'shall not be made the object of an attack' (Art. 41 API). In order to abide by the rule of distinction, LAWS must be programmed with a software allowing them to assess whether the *specific* human target is a legitimate one. For instance, if the enemy is surrendering, LAWS must be capable of capture and interpret the signal surrenders and act accordingly;[338] if during a military operation against insurgents (in an internal armed conflict scenario) an attack against an assumed hideout of enemy fighters is planned, to be fielded LAWS must be capable of pinpointing each individual and categorize them correctly (which normally happens to be complicated even to humans, as enemy fighters hardly wear fixed and distinctive sign) before using lethal force.[339]

However, the principle of distinction as such does not require that the process of selecting and engaging a target – both human and non-human – be carried out by a human agent. The fact that such assessment is

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[336] See Kolb, *Advanced Introduction*, cit., 126-142;

[337] Literature on the notion of 'direct participation in hostilities' (DPH) is abundant; for an overview, see Melzer, *Interpretive Guidance on the notion of Direct Participation in Hostilities under International Humanitarian Law*, Geneva, 2009; Sassoli-Bouvier-Quintin, *How Does Law Protect in War*, cit., at 264-265; Kolb, *Advanced Introduction*, cit., at 142-147.

[338] The issue of surrendering and LAWS has recently gained the attention of some scholars. See for instance Sparrow, *Twenty Seconds to Comply: Autonomous Weapon Systems and the Recognition of Surrender*, 91 INTERNATIONAL LAW STUDIES (2015), 699-728, particularly at 705 (acknowledging that recognizing surrender is 'likely to be difficult for robots' because of the hardness of perception as a task for robots and the context-related nature of the means commonly used to surrender, but not excluding the chance of technological advancements altogether); Boothby, *Autonomous Attack – Opportunity or Spectre?*, cit., at 79 ('[d]eveloping software to identify when a potential human target is manifesting an intent to surrender, is incapacitated by wounds or sickness or is in the power of an adversary is likely to prove challenging').

[339] For an in-depth analysis of the impact of LAWS on non-international armed conflicts, in particular when they are employed by insurgents, see *amplius* Radin-Coats, *Autonomous Weapon Systems and the Threshold of Non-International Armed Conflict*, 30 Temple Journal of International and Comparative Law Journal No. 1 (2016), 133-150 (addressing the scenario where non-state armed groups employ LAWS, and discussing whether this can influence threshold requirements for non-international armed conflicts, namely organization of the group and intensity of violence employed thereby).

inherently context-related does not imply that it is arbitrary by definition;[340] on the contrary, being constrained to follow pre-set rules of behavior coded into algorithms LAWS can make purely *objective* decisions, i.e. not influenced by emotion or misjudgments.[341] This is where machine are believed to be able to outpace humans: if conceived as a mere 'categorization' of the person or the object, targeting is a mechanical process that machine may perform better than humans.[342] In this sense, ATC can provide an adequate methodology for targeting decisions, provided that technology allowing for distinguishing permissible from impermissible targets is developed.[343] Again, should this happen, those who oppose the development and fielding of LAWS basing on a temporary 'technological objection' will be eventually discredited.

2.3.3 Proportionality

If civilians cannot be the object of *direct* attacks, this does not mean that civilians cannot be targeted at all. The principle of proportionality requires that in planning and executing an attack attention has to be paid to that the reasonably anticipated military advantage of an operation be weighed against the reasonably anticipated civilian harm – which takes the shape of

[340] There are some who however consider the assessment of military objective as inherently subjective and factual: since it cannot be programmed in advance, but only depends on the situation, such assessment is not suitable for machines. See for instance Akerson, *The Illegality of Offensive Lethal Autonomy*, in Saxon (ed.), *International Humanitarian Law*, cit., 65-98, at 79 (arguing that being the notion of military objective expressed in casuistic terms, '[t]he paradigm is thus unsuitable for a computer algorithm for two reasons: it cannot be expressed with precision and its value can only be determined in the context of application').

[341] One may wonder to what extent a machine capable of developing self-made algorithms to adapt to changing environments still follows pre-programmed rules. On closer inspection, however, this chance is – not surprisingly – welcomed by the very requirements of Targeting Law: if distinction posits a constant adaptation to the present circumstances, the more a machine can respond to new stimuli the more compliant will it be with IHL.

[342] See Sassoli, *Autonomous Weapons and International Humanitarian Law: Advantages, Open Technical Questions and Legal Issues to be Clarified*, 90 International Law Studies (2014), 308-340, at 332-333 (contrasting those who equate targeting with capital punishment).

[343] For more on ATC, see Chapter I.

'collateral damage'. So civilian harm is not impermissible *at all*; it is if disproportionate.[344]

It has been noted that accidental civilian loss is somehow essential to warfare.[345] As a matter of fact, versions of the principle of proportionality have been proposed for centuries, not only in the domain of war;[346] but surprisingly it has never been translated in a written provision. The Preamble of the Saint Petersburg Declaration recalls the idea of proportionality (although not relating to civilian casualties but to unnecessary suffering),[347] and the Geneva Conventions remained silent on the point. Only with API the principle was expressed in two provisions. According to Art. 51, par. 5, litt. b), an attack is to be considered 'indiscriminate' if the 'incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof' is expected to be 'excessive in relation to the concrete and direct military advantage anticipated'. According to Art. 57, par. 2, litt. b), this being the case, there is

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[344] See Kolb, *Advanced Introduction*, cit., at 172 (noting that the proportionality requirement is negative in nature, as it does not require that a belligerent insure a certain balance but rather that he refrain from a manifest imbalance); Noll, *Analogy at War: Proportionality, Equality and the Law of Targeting*, 43 NETHERLANDS YEARBOOK OF INTERNATIONAL LAW (2013), 205-230 (exploring the structure of analogical thinking throughout history).

[345] See Dinstein, *Discussion: Reasonably Military Commanders and Reasonable Civilians*, in Wall (ed.), *Legal and Ethical Lessons of NATO's Kosovo Campaign*, 78 INTERNATIONAL LAW STUDIES (2002), at 219 ('[a]nyone even mildly interested in international humanitarian law must strive to bring about a better world in which civilized [*sic*] losses in war are minimized. Nevertheless, the realistic goal is to minimize civilian casualties, not to eliminate them altogether. *There is no way to eliminate civilian deaths and injuries …*', italics mine). By the same token, see critically Noll, *Sacrificial Violence and Targeting in International Humanitarian Law*, in Engdahl-Wrange (eds.), *Law At War: The Law As It Was And The Law As It Should Be. Liber Amicorum Ove Bring*, Leiden, 2008, 207-218 (underscoring the symbolic relevance of incidental and lawful civilian losses within the framework of IHL).

[346] For instance, see Grotius, *De Jure Belli ac Pacis Libri Tres*, Book III, Chapter XI, par. VIII, according to whom the destruction of innocents is not tolerable for the sake of many, 'unless for some extraordinary reason'. Catholic theology had already elaborated the principle of 'Double Effect' to justify, inter alia, proportionality assessments in the choice of two goods. See more extensively Gardam, *Proportionality and International Law*, 87 AMERICAN JOURNAL OF INTERNATIONAL LAW No. 3 (1993), 391-413.

[347] See *supra*: 'this objective [to weaken the military forces of the enemy] would be exceeded by the employment of arms which uselessly aggravate the suffering of disabled men, or render their death inevitable'.

an obligation to suspend or cancel the attack. The principle is not stated in APII; it is however believed to be applicable either as a corollary of the principle of humanity as a restraining power on military force or as a customary norm.[348]

The principle of proportionality establishes that only a disproportion in the military advantage at the expenses of civilian loss must be considered unlawful. It is argued that the two competing goods – military advantage and human life – are as a matter of fact incomparable:[349] even if it has been proposed that proportionality calculations be translated into algorithms,[350] to most commentators weighing military advantage and civilian loss remains inherently subjective and context-related,[351] that is lacking the objectivity necessary to elaborate workable algorithms for machines. However, standards of reasonableness are widely accepted in practice to give content to the vague notion of proportionality.[352] It follows that while it seems impossible to fix the threshold beyond which a civilian loss is excessive in comparison with military advantage *once and for all*, in practice

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[348] Henckaerts&Doswald-Beck, *Customary International Humanitarian Law*, cit., *Rule 14*, at 48; see also ICTY, *Prosecutor vs. Kupreškić and Others*, IT-95-16-T, 14 January 2000, § 524.

[349] See Noll, *Analogy at War*, cit., particularly at 213-215; see also ICTY, *Final Report to the Prosecutor by the Committee established to review the NATO bombing campaign against the Federal Republic of Yugoslavia*, 8 June 2000,39 International Legal Materials 1257 [48] ('[o]ne cannot easily assess the value of innocent human lives as opposed to capturing a particular military object'). See also the *Manual on the International Law Applicable to Air and Missile Warfare*, by the Program on Humanitarian Policy and Conflict Research (HPCR), Cambridge, 2013, at 92 ('the term 'excessive' is often misinterpreted. It is not a matter of counting civilian casualties and comparing them to the number of enemy combatants that have been put out of action').

[350] See Guisández Gómez, *El Principio de la Proporcionalidad y los Daños Colaterales. Un Enfoque Pragmático*, in Prieto Sanjuán, *Conduccion de Hostilidades y Derecho Internacional Humanitario*, Bogotà, 2007, 197-243.

[351] See Wagner, *Autonomy in the Battlespace*, cit., at 120; Noll, *Analogy at War*, cit., 215 ff. (inquiring into what he calls 'the silence of IHL in determining what is excessive violence'); ICRC 2014 Report, cit., at 82 (underscoring that the assessment is based on information available at the time of the attack and is thus necessarily dependent on specific circumstances).

[352] See Sandoz-Swinarski-Zimmermann (eds.), *Commentary*, cit., at 683-684 (according to which the principle of proportionality must be interpreted as 'a question of common sense and good faith for military commanders', who 'must carefully weigh up the humanitarian and military interests at stake' in every attack).

the single assessment can be struck by making recourse to notions such as that of reasonableness.[353]

This holds true irrespective of who (or what) is making the proportionality assessment, be it a human operator or a machine.[354] If so, one cannot see why things should be different when it is up to machines to make the assessment. However, when lethal decisions are at stake, many contend that LAWS should not be left to apply the proportionality principle 'unless constantly updated about military operations and plans':[355] if a LAWS is unable to properly assign values in given circumstances (one may think of complex, shifting situations in densely populated areas), then a human operator 'on-the-loop' must step in and guide the machine to the goal.

Again, the need for human supervision is resorted to as a panacea against foreseeable deficiencies of the machine. But let us imagine that LAWS can assign values and carry out proportionality assessment completely on their own, without needing to ask for a human judgment. Their action will be evaluated through the very same criteria applicable to human decision: the collection of sufficient and reliable information and a 'reasonable use' thereof to perform the action. The legality of the outcome

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[353] Such interpretive tools are commonly employed in the case-law of international tribunals. See for instance ICTY, *Prosecutor vs. Galić*, IT-98-29-T, Judgment, 5 December 2003, § 58 ('in determining whether an attack was proportionate it is necessary to examine whether a reasonably well-informed person in the circumstances of the actual perpetrator, making reasonable use of the information available to him or her, could have excepted excessive civilian casualties to result from the attack').

[354] Anderson-Reisner-Waxman, *Adapting the Law*, cit., at 403 ('[a]lthough there is a general sense that such excess can be determined in truly gross cases, there is no accepted formula that gives determinate outcomes in specific cases'); Schmitt-Thurner, "*Out of the Loop*", cit., at 256-257 (describing the notion of excessiveness as 'the product of a case-by-case assessment that is evaluated in terms of its reasonableness given the attendant circumstances', and believing it to be possible to objectivize the notion through appropriate methodologies such as the 'collateral damage estimate methodology'); Sassoli, *Autonomous Weapons*, cit., at 331 (however strongly endorsing the need for an objective notion of proportionality); Boothby, *How Far Will the Law Allow Unmanned Targeting to Go*, in Saxon (ed.), *International Humanitarian Law*, cit., 43-63, at 56 (explaining how much balancing can turn out to be challenging for commanders, planners and generally decision-makers).

[355] In the words of Sassoli, *Autonomous Weapons*, cit., at 332. In the same line, see Wagner, *Autonomy in the Battlespace*, cit., at 121.

– for instance, the killing of civilians in the surroundings of an enemy hideout – will depend on an *ex ante* assessment and not on the decider being a human operator or a machine, *coeteris paribus*. The 'technological objection' raised by the supporters of LAWS would fade away at that precise moment: the (unconvinced) skepticism that animate these authors has weak arguments to oppose to learning algorithms, strong A.I. capabilities, and the entire set of revolutionary functionalities analyzed above.[356]

To state that proportionality is 'hard' to be translated into algorithms because of its subjectivity is nothing but smoke and mirrors, for at least the following reasons. *First*, situational assessments of such kind have always been made by humans, with (almost) nobody claiming that they are *per se* illegal. *Second*, scientific research will sooner or later elaborate algorithms able to replicate human judgments and to have a machine acting in real-life scenarios (whether cluttered or clustered, in the end it does not matter: some human lives will be taken by machines in both cases). In this scenario, the basic requirement of proportionality would be satisfied, and LAWS would be suitable for fielding.

2.3.4 Precautions in Attack

Another core principle of Targeting Law is that of precautions in attack or, more generally, precaution: in the conduct of hostilities, parties to armed

[356] Consider, among many, Schmitt, *Autonomous Weapon Systems and International Humanitarian Law: A Reply to the Critics*, 1 Harvard National Security Journal Features (2013), 1-37, at 21 (emphasizing the uncountable 'imaginable scenarios and variables that might occur during hostilities': what if learning algorithms provided the answer? Should proportionality assessment be left entirely to LAWS? In the view of their supporters, obviously yes). Again Schmitt contends that '[g]iven the complexity and the fluidity of the modern battlespace, it is unlikely that, despite impressive advances in artificial intelligence, 'machines' will soon be programmable to perform robust assessments of a strike's military advantage on their own' but it warns that, in any case (implicitly: even if technology could advance that far), machine's action should not be treated as such differently from human's action: '[n]either the human nor the machine is held to a standard of perfection; in the law of armed conflict the standard is always one of reasonableness'; see Schmitt-Thurner, *"Out of the Loop"*, cit., at 257.

conflict are required to take constant care to spare civilians and civilian objects. The precautionary rule was first stated in Art. 57 API,[357] and believed to be supplementary to the principle of distinction, which would imply that agents take all reasonable precautions in order to minimize civilian exposure to risks associated with military operations.[358]

The precautionary rule is addressed to those planning or deciding upon an attack; according to some, most times this encompasses only human commanders, being it placed 'at a level above and individual weapon'.[359] Assuming so, precautions in attack would be confined only to the planning phase, the operation, and its rules of engagement: all assessment commanders, and not soldiers, are called to make. As explained in the Commentary, such interpretation contrasts with the 'very large majority of the delegations at the Diplomatic Conference', whose intent was to cover also the situations 'which may arise during *close combat*' where quick and serious decisions must be taken by officers 'of subordinate rank'.[360] Namely close combat is where ground LAWS will presumably be deployed.[361] The notion of 'attack' must therefore be interpreted *broadly*, so

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[357] See Henckaerts&Doswald-Beck, *Customary International Humanitarian Law*, cit., *Rule 15*, at 51 (recalling that the very first formulation of the principle was contained in Art. 2, par. 3, of the 1907 Hague Convention (IX), which establishes a duty for the commander of a naval force to 'take all due measures' so as that an undefended town that is about to be attacked might suffer 'as little harm as possible'). The specific rule was then generalized and made applicable to all armed conflict by API. See also the relevant State practice recalled in the Rule.

[358] See Sandoz-Swinarski-Zimmermann (eds.), *Commentary*, cit., particularly at 680.

[359] This is the position of Anderson-Reisner-Waxman, *Adapting the Law*, cit., at 404.

[360] See Sandoz-Swinarski-Zimmermann (eds.), *Commentary*, cit, particularly at 681, italics mine.

[361] The fact that in (limited) circumstances precautionary assessments must be taken by subordinated combatants is not discarded by those who contend that LAWS will not be allowed to make them. First of all… they address the issue, meaning that it is not logically ungrounded. Second, they contemplate the chance of it as made evident by the choice of words: for instance, Anderson & others state that '[a]lthough some precautionary measures might have to be programmed into a genuinely and fully autonomous weapon system, in reality many of the precautions that might be at issue are not so much a question of what the weapon system does in a particular missile strike as part of a larger operation or battle, but instead are addressed in the planning for the overall attack as an operation, including the development of the rules of engagement' (see Anderson-Reisner-Waxman, *Adapting the Law*, cit., at 404).

as to include 'those who plan the particular sortie'.[362] Precautionary assessment could be made also by a machine through algorithmic calculation duly tested by human programmers: what matters is whether the single assessment is going to be made by LAWS or by a human operator.[363]

According to Art. 57, par. 2(a)(i), the obligation to take 'constant care' of civilian population, civilians and civilian objects enshrined includes the duty to do 'everything feasible' to verify that the above-mentioned are not the object of the attack. The notion of *feasibility* plays a pivotal role here; albeit left undefined, it can be interpreted as referring to 'those precautions which are practicable or practically possible taking into account all *circumstances ruling at the time*'.[364] As it was for distinction and proportionality, the principle of precaution too relies on a situational, context-related assessment: what matters is at which temporal point those circumstances become relevant. If precautionary rule is addressed to the human operator fielding LAWS, then the circumstances will be those of *that* moment: what happens next which was unknown or unknowable to the operator falls outside the scope of the rule. Precaution also encompasses the choice of means and methods of warfare with a view to avoiding or minimizing incidental loss, as established by Art. 57 (2)(a)(ii),[365] and the proportionality assessment required by the following Art. 57 (2)(a)(iii).[366]

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[362] See Boothby, *Autonomous Attack*, cit., at 80-81 (however arguing that only humans – commanders, officers, and in particular programmers of LAWS – are addressed by the rule).

[363] See Sassoli, *Autonomous Weapons*, cit., at 336 (noting that in spite of the contention that only human being can plan and decide to conduct an attack, it is possible that they do so 'temporally and geographically removed from the attack, as long as they define the parameters ac- cording to which the robot attacks, make sure that it complies with them and has the necessary information to apply such parameters').

[364] See Article 3, par. 10, Amended Protocol (II) to the CCW, cit., italics mine.

[365] The provision is commonly believed to reflect customary law; see Henckaerts&Doswald-Beck, *Customary International Humanitarian Law*, cit., *Rule 17*, at 57.

[366] See Henckaerts&Doswald-Beck, *Customary International Humanitarian Law*, cit., *Rule 18*, at 58.

So far, it appears that the precautionary call is reserved to a human operator. In some cases, however, it seems that a different understanding of the rule may emerge: a telling example is that of Art. 57 (2)(b), which requires each party to the conflict to cancel or suspend an attack once targeting conditions are (no longer) met.[367] Applying this provision to LAWS, it is implied that LAWS must be equipped with 'override' devices that allow humans to abort operations in real time.[368] Some argue that this would be a positive but not fundamental requirement. As a matter of fact, an analogy can be drawn between LAWS and cruise missiles: as the latter cannot be 'called back' after firing (a change in circumstances being irrelevant from this moment on), so LAWS might not be 'called back' after fielding.[369] On a more general plane, it has been argued that there is no theoretical obstacle for the precautionary rule to apply fully to LAWS; what is more, existing IHL rules would also ensure proper accountability for individuals violating this rule when developing or deploying LAWS.[370]

In our view, an overriding device undoubtedly is an auspicious solution in order to ensure compliance with the precautionary rule. Yet the point is whether it is plausible in a future populated by independent decision-making machines and with a sensibly increased tempo in battlefield.[371] In such scenario it is arguable that specific calls on aborting the operation should be taken by LAWS *themselves*, the goal being to safeguard distinction and proportionality rules.[372] The criteria basing on which the principle of precaution operates are not different from those we

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[367] See Henckaerts&Doswald-Beck, *Customary International Humanitarian Law*, cit., *Rule 19*, at 60.

[368] See ICRC 2014 Report, cit., at 86 (and references therein).

[369] Boothby, *How Far*, cit., at 58.

[370] Reference here is to Henderson-Keane-Liddy, *Remote and Autonomous Warfare Systems – Precautions in Attack and Individual Accountability*, in Ohlin (ed.), *Research Handbook on Remote Warfare*, Cheltenham-Northampton, 2016, 335-370.

[371] As correctly observed in the Heyns Report, cit., at § 41.

[372] According to Anderson-Reisner-Waxman, *Adapting the Law*, cit., at 406, 'autonomous systems might be better able to satisfy the law in some uses and environments than others, but that is *not a matter of principle*; it is a matter of *whether and how far* technological capability advances relative to the legal standards', italics mine.

encountered above: 'good faith and reasonableness'.[373] Given their being inherently context-related, the technological challenge would therefore be to formulate algorithms that replicate human judgment in a working manner. It is therefore impossible to rule out that LAWS capable of acting in accordance with the principle of precaution will be developed.

2.4 An Incidental Conclusion on LAWS: Weapons, Combatants or Tertium*?*

LAWS raise an important issue of categorization in IHL: should they be conceived as weapons, thus being regulated by Weapons Law, or should they be treated like combatants, thus being subject to Targeting Law?[374]

The majority of commentators firmly supports the Weapons Law model.[375] At the opposite end of the spectrum lie those who believe that the analogy with weapons is essentially impaired. Chengeta, for instance, tackles the issue of advanced A.I. applied to machines and concludes that their autonomous offensive capabilities render them new-generation 'robot-combatants' rather than traditional weapons, which makes them escape even the legal review established by Art. 36 API.[376] The nexus between the 'master' (i.e. the combatant) and the 'tool' (i.e. the weapon) is severed in weapons that can make their concrete decisions independently of human intervention.

A position, so as to speak, fairly equidistant from the two above is defended by Crootof.[377] She contends that the analogies between LAWS and

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[373] Anderson-Reisner-Waxman, *Adapting the Law*, cit., at 404.

[374] This is the issue faced by Crootof, *Autonomous Weapon Systems and the Limits of Analogy*, cit., *passim*.

[375] See Anderson-Reisner-Waxman, *Adapting the Law*, cit., *passim*.

[376] See Chengeta, *Are Autonomous Weapon Systems*, cit., at 77. In Chengeta's view, for a weapon (or broadly for a 'capability') to be subject to legal review there must be some effective human control on it at the precise moment lethal force is applied: '… there can never be meaningful human control of the use of force where the decision to use lethal force is made by a machine with no human being giving consideration *in real time*'; ibidem at 80, italics mine.

[377] See Crootof, *Autonomous Weapon Systems and the Limits of Analogy*, cit., *passim*.

weapons or combatants (as well as children and animals)[378] are at the same time misleading and constraining, which leads her to conclude that a 'new law' is required to regulate such 'unconventional warfighters' and to urge for the adoption of an *ad hoc* treaty on LAWS.[379] In this sense, her position diverges from most LAWS supporters, who claim that extant IHL norms can effectively address and regulate autonomous weaponry.[380]

While *in principle* we agree with Crootof on the newness of LAWS – 'warfighters' that have no precedent in the history of warfare – and on the unsatisfying result of stubbornly drawing analogies with weapons and combatants, this does not imply that contemporary IHL is *completely* inadequate to regulate such 'warfighters'. Difficulty in placing LAWS into traditional categories rather witnesses to another element, which in our view plays a key role in assessing LAWS's compatibility with IHL: that is, the circumstance that a *historical* change in waging war is ongoing today. This may (and in our view *should*) inspire a more in-depth, principled reflection on autonomous killing by the international community at large. It is an *unprecedented* reflection in the true sense of the word: at no point in human history mankind has faced a similar scenario. Such circumstance is indeed fundamental to understand the following analysis through the lenses of the Martens Clause.

2.5 'Principles of Humanity' & 'Dictates of Public Conscience'

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[378] In her view, these two uncommon analogies fail to regulate LAWS adequately. As for children, their employment in armed conflict as combatants is grounded on the need to protect children and their special rights (*ibidem*, at 18), a rationale that cannot be extended to machines. As for animals, they cannot be assimilated to machines, since animals: are basically employed to support soldiers; enjoy no protection in IHL; cannot be taught IHL, which conversely is at the core of the debate on LAWS (*ibidem*, at 21).

[379] *Ibidem*, at 24. The name 'warfighters' is elected as it keeps these new 'tools' exerting lethal force distinct from combatants, whose *status* is already recognized and regulated by IHL Conventions.

[380] See for instance Anderson-Reisner-Waxman, *Adapting the Law*, cit., at 411 ('… international regulation of autonomous weapon systems should begin with the premise that the law of armed conflict provides an appropriate general framework').

Both Weapons Law and Targeting Law are fairly demanding in terms on when and how to resort to lethal force in armed conflict; however, simply technological obstacles will be overcome eventually, so 'technological' objection to LAWS is deemed for failure, sooner or later. LAWS's opponents dispose however of a 'trump' argument against this technology, i.e. that LAWS *as such* violate established principles of IHL, namely the 'principles of humanity' and the 'dictates of public conscience' (the so-called Martens Clause). It is an argument that reiterates the well-known dichotomy between positive and natural law.[381] The aim of the present Paragraph is therefore to shed light on the nature of such principles under IHL (3.5.1) and therefore to assess arguments against LAWS (3.5.2).

2.5.1 The Martens Clause

'[H]ailed as a significant turning point in the history of [IHL]',[382] the famous Martens Clause was first inserted in the Preamble of the 1899 Hague Convention II:[383] such clause, named after the Russian delegate to the Hague

[381] Reference is made to O'Connell-Day, *Sources and the Legality and Validity of International Law. Natural Law as Source of Extra-Positive Norms*, in Besson-D'Aspremont (eds.), *The Oxford Handbook on the Sources of International Law*, 2017, 562-580. For a modern appraisal of natural law as source of international law, see also Lauterpacht, *The Grotian Tradition in International Law*, British Yearbook of International Law 23 (1946), 1-53. There are several scholars that recently have tried to defend a more incisive role for natural law in the international law-making. Judge Cançado Trindade finds the 'public conscience' as a source of natural law endowed with binding force; Cançado Trindade, *Some reflections on the principle of humanity in its wide dimension*, in Kolb-Gaggioli (eds), *Research Handbook on Human Rights and Humanitarian Law*, Cheltenham-Northampton, 2013, 188-195, at 195. In his dissenting Opinion in the Nuclear Weapons case Judge Koroma labelled the quest for specific legal prohibition on weapons, means and methods of warfare (namely, nuclear weapons) as 'an extreme form of positivism' (see ICJ, *Nuclear Weapons*, cit., *Dissenting Opinion of Judge Koroma*, p. 14.). However, most international scholarship today fiercely opposes arguments grounded in natural law: see *ex multis* Weil, *Towards Relative Normativity?*, American Journal of International Law 77 (1983), 413-432; Kingsbury, *Legal Positivism as Normative Politics: International Society, Balance of Power and Lassa Oppenheim's Positive International Law*, EJIL (2002), 401-437.

[382] As contended by Cassese, *The Martens Clause: Half a Loaf or Simply Pie in the Sky?*, in Cassese-Gaeta-Zappalà (eds.), *The Human Dimension of International Law*, Oxford, 2008, 39-67, at 39.

[383] See Convention (II), cit., Preamble.

Peace Conference F. F. de Martens who proposed it,[384] stipulates that, being it impossible to regulate all circumstances that could occur in time of conflict, and whenever existing laws of war were to be found incomplete, civilians and combatants 'remain under the protection and the empire of the *principles of international law*, as they result from the usages established between civilized nations, from the *laws of humanity*, and the *requirements of the public conscience*'.[385]

Before discussing the content, it is helpful to recall the origin of the Clause. The Peace Conference was discussing the treatment of civilians taking up arms against an occupying force when a dispute arose between the Delegates: on the one hand some – especially military powers – suggested they should be regarded as *franc-tireurs* and treated accordingly (namely subjecting them to capital punishment); on the other hand, smaller States, fearing that their territories could become the theatre of military occupation, believed it to be more appropriate to extend the *status* of combatants to them.[386] The Clause – which was then proposed as a compromise and purposely drafted in vague terms – was intended to establish that the conduct of hostilities must be governed by international law even absent written rules.[387] It can be said to act as a permanent reminder that what proves to be inhumane and abhorrent in war could

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[384] On the historical role of the Russian diplomat, see more extensively Pustogarov, *F. F. Martens (1845-1909), a Humanist of Modern Times*, 312 International Review of the Red Cross No. 36 (1996), 300-314; Miyazaki, *The Martens Clause and International Humanitarian Law*, in Swinarski, *Studies and Essays on International Humanitarian Law and Red Cross Principles in Honour of Jean Pictet*, Geneva, 1984, 433-444.

[385] Ibidem, *italics mine*.

[386] See Kalshoven-Zegveld, *Constraints on the Waging of War*, cit., at 11-12.

[387] See Kolb, *Advanced Introduction*, cit., at 20 (underscoring that the clause is meant to rebut 'any mechanical application of the principle, inherent in prohibitive bodies of law, namely that "what is not prohibited is allowed"'). Cassese explains that Martens proposed his clause in order to rebut the Belgian proposal of leaving some matters concerning military occupation unregulated by written law; the Belgians were confident that the inherent vagueness of customary law could favor the position of smaller States at the Conference. Martens displayed a 'grandiloquent rhetoric' (Cassese, *The Martens Clause*, cit., at 46) to elaborate a formula that could satisfy the opposed interests of the States gathered at the Conference. The Author concludes that Martens 'used loose language for the purpose merely of solving a diplomatic problem' (ibidem, at 54).

never be tolerated.[388] The Martens Clause is repeated almost verbatim in the Preamble of the 1907 Hague Convention (IV),[389] the 1949 Geneva Conventions,[390] the 1977 Additional Protocols, the CCW,[391] and many other instruments.

What are the bases of the 'repulsion' that animates the Clause? One may be tempted to answer that they are merely moral imperatives, void as such of binding force. This conclusion sounds too premature, at least as far as 'established custom' is concern. As a matter of fact, it has to be understood as referring to customary law: if a weapon, means or method of warfare is not proscribed by treaty law, it may still be unlawful if it is not consistent with a *customary* norm. If the Clause terminated here, it would be at best redundant. On the contrary, 'principles of humanity' and 'dictates of public conscience' are acknowledged to refer to extra-positive sources of law. As Cassese put it, 'Martens deserves credit for crafting such an ingenious blend of natural law and positivism',[392] being him the first who, probably unknowingly, approached moral principles from an 'apparently positivist'[393] perspective.

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[388] Cassese, *The Martens Clause*, cit., at 69 (concluding that in spite of its broadly diplomatic rather than strictly humanitarian rationale, the Clause has been nonetheless employed to promote a better protection of human dignity).

[389] See *supra*. Note that the 1907 version is slightly different from the previous one, some terms having been replaced with new ones ('inhabitants' replaced 'population'; 'law of nations' was substituted for the more modern 'international law'; 'requirements' was replaced by 'dictates'); the substantive content of the provision remained untouched though (see Meron, *The Martens Clause, Principles of Humanity and Dictates of Public Conscience*, 94 AMERICAN JOURNAL OF INTERNATIONAL LAW (2000), 78-89, at 79).

[390] More precisely in the denunciation clauses of the four Conventions (Common Articles 63/62/142/148): the goal is to make clear that States party to those treaties, in case of their denunciations, remain nevertheless bound by the principles of the law of Nations. See Meron, *The Martens Clause*, cit., at 80.

[391] See the Preamble of CCW, cit.: 'in cases not covered by this Convention and its annexed Protocols or by other international agreements, the civilian population and the combatants shall at all times remain under the protection and authority of the principles of international law derived from established custom, from the principles of humanity and from the dictates of public conscience'.

[392] See Cassese, *The Martens Clause*, cit., at 40.

[393] *Ibidem*.

The legal significance to be attributed to the Clause is therefore disputed. On the one hand are those who deny the Clause any normative relevance, on the other hand are those who acknowledge that to a certain extent it can bind States and other relevant actors.[394] Some assert that the Clause may serve only as an interpretative tool of existing IHL norms.[395] Allegedly it remains confined to a gap-filling or, at most, to an inspiring, *de jure condendo* role. The Martens Clause could not prohibit a specific weapon, means and method of warfare *ex se*, as suggested by the very factual circumstance that so far no weapon, means and methods of warfare has been considered as proscribed on the sole basis of the Martens Clause.[396] Both domestic and international case-law seem to resort to the Clause: (1) to confirm a solution already reached thanks to the application of existing law; (2) to advance a new interpretation thereof; (3) to reject *a contrario* arguments. In addition, written and oral proceedings before the ICJ in the *Legality of the Threat or Use of Nuclear Weapons* case give important indications on States' practice, with numerous Delegation contrasting any sort of Clause's binding effect.[397]

Such a positivist take on the Clause has several drawbacks. For instance, it neutralizes *de facto* the scope of the provision, which is reduced to a mere re-statement of existing positive norms. One may therefore wonder whether another interpretation of the Clause has to be preferred, in accordance with the ancient maxim *ut res magis valeat quam pereat*. A second group of scholars has thus suggested that the Clause should have an impact

[394] The divide between a 'narrow' and a 'broad' view of the Clause was proposed by Ticehurst, *The Martens Clause and the Laws of Armed Conflict*, 317 INT'L REV. RED CROSS 125, 126 (1997). More recently, a tri-partition has been proposed in lieu of the bi-partition: see Evans, *At War With Robots: Autonomous Weapon Systems and the Martens Clause*, 41 Hofstra Law Review No. 3 (2013), 697-734.

[395] See Schwarzenberger, *The Legality of Nuclear Weapons*, London, 1958, 10-11 (highlighting that the Clause was adopted with a view to preventing 'an unintended and cynical argument *a contrario*'); Abi-Saab, *The Specificities of Humanitarian Law*, cit., 274-275.

[396] This is the position held by Cassese, *The Martens Clause*, cit., *passim*.

[397] Cassese, *The Martens Clause*, cit., and references therein.

on the sources of international law.[398] The same idea has been supported, *inter alios*, by Judge Shahabuddeen, who argued that both 'principles of humanity' and 'dictates of public conscience' operate as principles of international law – thus as *normative* sources – albeit their precise content has to be 'ascertained in the light of the changing conditions'.[399] Rephrasing his argument, it seems possible to distinguish between a *static* content and a *dynamic* efficacy concentrated in the Martens Clause. Again, Cassese concludes his thorough review on the legal validity of the Clause envisaging that as *lex specialis* it 'loosens the requirements prescribed for *usus*, while at the same time elevating *opinio* (*iuris* or *necessitatis*) to a rank higher than that normally admitted'.[400] In a different fashion, Meron too seems to admit that the Martens Clause can play a normative role. After asserting that it 'does not allow one to build castles of sand', he concedes that '[e]xcept in *extreme cases*, its references to principles of humanity and dictates of public conscience cannot, alone, delegitimize weapons and methods of war, especially in contested cases'.[401] It is legitimate though to wonder on which criteria a source can sometimes (almost always) be void of binding effect, and sometimes (quite rarely) have that same effect. Either the Martens Clause is a normative source or it is not: *tertium non datur*.

An alternative view to express Meron's position may be the following. In most cases, existing IHL (thus, positive law) suffice to proscribe weapons, means and methods that are at variance with 'principles

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[398] See Cassese, *The Martens Clause*, cit., at 42-43 (comparing and contrasting scholarship on the point). See in particular See Röling, *International Law in an Expanded World*, 1960, at 37-38 (arguing that the *sedes materiae* of the clause in the four Geneva Conventions – denunciation of the treaties – is indicative of the fact that it contains specific rules of conduct for States should those treaties cease to bind them); Strebel, *Martens Clause*, in Bernhardt (ed.), *Encyclopedia of Public International Law*, vol. III, 1997, at 327 (underscoring that the clause is particularly apt to address rapid technological evolution).

[399] ICJ, *Nuclear Weapons*, cit., at 406: 'the principles would remain constant, but their practical effect would vary from time to time: they could justify a method of warfare in one age and prohibit it in another'.

[400] See Cassese, *The Martens Clause*, cit., at 67 (comparing the role played by the Martens Clause in IHL to that of 'elementary considerations of humanity' in general international law).

[401] Meron, *The Martens Clause*, cit., at 88, emphasis added.

of humanity' and 'dictates of public conscience'; the vast majority of scholars and authorities cited above acknowledge indeed that positive law derives therefrom. There are (few) cases, however, when positive law as such does not regulate a specific weapon, means and method of warfare appearing nonetheless as inconsistent with 'principles of humanity' and 'dictates of public conscience'. In these cases, the latter come to the fore and exercise their normative power directly, without the intermediation of positive law. In Aristotelian terms, their *potential* normative force is always present and switches to *actual* normative force only when positive law is absent.

This position has been captured years ago by an Italian international lawyer, Benvenuti.[402] He argued that the Martens Clause, in codifying 'principles of humanity' and 'dictates of public conscience', referred to 'substantial values, inherent in individual and group relations [that] […] by virtue of their foundations […] impose themselves, by their own force, in the legal order'.[403] Those 'principles' and 'dictates' constitute the 'universal,

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[402] Benvenuti, *La Clausola Martens*, cit., (all translations are ours). Benvenuti argues that the natural status of 'principles of humanity' and 'dictates of public conscience' attaches more importance to how they perform rather than where they come from. In legal scholarship *jus naturale* is often named as *jus necessarium*, which refers to the need for that body of law to remain valid even in the most critical situations human society can face, namely war. The often-quoted maxim '*sileant ergo leges inter arma*' – one must not forget – goes on specifying: '*sed civiles illae et judiciariae et pacis propriae, non aliae perpetuae et omnibus temporibus accomodatae*'. In sum, that positive law can be voided in times of war does not imply that extra-positive law does not apply as well. Benvenuti refers extensively to the Lieber Code: see for instance Arts. 40 ('[t]here exist no law or body of authoritative rules of action between hostile enemies, except that branch of law of nature and nations which is called the law and the usages of war on land') and 41 ('[a]ll municipal law of the ground on which the armies stand, or of the countries to which they belong, is silent and of no effect between the armies on the field'). On the contrary, extra-positive law has been recognized as imposing direct obligations on the Parties to a conflict. Benvenuti makes then the telling example of slavery, which has never been acknowledged by *jus naturale*. He then cites privateering and the reflections made by another Italian scholar, Fiore, who commented so: 'privateering is today abolished, and it is an absolute prohibition set forth by international law. It was extremely useful to have solemnly *declared* so in Paris … so that … signatory States showed all States that do not wish to act in opposition to the civilized world what is the path they would walk on, if they want to respect *principles of absolute justice*' (at 205, emphasis added).

[403] *Ibidem*, at 179.

and at the same time historically determined foundation' of all conventional and customary IHL.

To sum, 'principles of humanity' and 'dictates of public conscience' have heavily contributed to the development of IHL throughout the past century. Undisputedly the Martens Clause plays a *de jure condendo* role; whether it has a normative status, inasmuch as source of extra-positive law, is more contrasted. However, drawing an analogy with the reflection on human dignity in IHRL,[404] it seems that the legal debate on the Martens Clause is more developed and has led to noteworthy, principled outcomes. An explanation of this can be found in the conception of IHL as a legal system as profoundly indebted to morality, where extra-positive law has always been a suggestive reference for natural-law thinkers. Such openness to extra-positive law could but be well reflected in the debate on LAWS.

2.5.2 The Relevance of the Martens Clause in the Debate on LAWS

'Principles of humanity' and 'dictates of public conscience' are constantly employed as an argument against LAWS.[405] Attention will be devoted, in turn, to: (*i*) State practice; (*ii*) other international actors; (*iii*) legal scholarship.

States referring to the Martens Clause or to the principle of humanity at large have been numerous so far:[406] to name few, Brazil[407] at the 2014 MoE;

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[404] See *infra*, Chapter III.

[405] See in particular the Report recently published by HRW-IHRC, *Heed the Call. A Moral and Legal Imperative to Ban Killer Robots*, 2018, available at https://www.hrw.org/report/2018/08/21/heed-call/moral-and-legal-imperative-ban-killer-robots.

[406] The same disclaimer applies: we cited only some interventions that have some relevance for the issue considered here, in an exemplifying rather than analytical fashion. See ICRC, Ethics and autonomous weapon systems, cit., § 15 (listing the States that have generally referred to the Clause or its content: Algeria, Argentina, Austria, Belarus, Brazil, Cambodia, Costa Rica, Cuba, Ecuador, Egypt, France, Germany, Ghana, Holy See, India, Kazakhstan, Mexico, Morocco, Nicaragua, Norway, Pakistan, Panama, Peru, Republic of Korea, Sierra Leone, South Africa, Sri Lanka, Sweden, Switzerland, Turkey, Venezuela, Zambia and Zimbabwe).

[407] https://www.unog.ch/80256EDD006B8954/(httpAssets)/12688EA8507C375BC1257CD70065815B/$file/Brazil+MX+LAWS.pdf (considering the Clause in a '[l]ast but not least'

Sri Lanka[408] and Ecuador[409] at the 2015 MoE; Australia[410] and Sierra Leone[411] at the 2016 MoE; Brazil[412] and Sri Lanka[413] again at the 2017 GGE. In appealing to the Martens Clause States do not distinguish between legal and moral arguments: in most cases the Martens Clause is seen through the lens of morality. Nor do States refer to a particular meaning of the Clause: they content themselves with affirming that 'principles of humanity' and 'dictates of public conscience' could run against LAWS, without specifying *which* of them would act so.

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position, and underscoring its being 'a keystone' of IHL without specifying on which grounds LAWS would be incompatible therewith though).

[408] https://www.unog.ch/80256EDD006B8954/(httpAssets)/30534E70A6CFAAC6C1257E26005F2B19/$file/2015_LAWS_MX_Sri+Lanka.pdf (recalling the Clause and therefore expressing guardedness about 'allowing any level of autonomy in the use of weapons systems' as '[t]he implications of LAWS becoming the moral-discerner in its own right, without human control, are far reaching to contend with').

[409] https://www.unog.ch/80256EDD006B8954/(httpAssets)/8FD4D07ECAF70100C1257E26005E147F/$file/2015_LAWS_MX_Ecuador.pdf (expressing concerns about 'aspectos fundamentales' such as 'la inobservancia de la ética y de los derechos humanos fundamentales, en particular de la cláusula de Martens').

[410] https://www.unog.ch/80256EDD006B8954/(httpAssets)/008A00242684E78FC1257F920057BD3C/$file/2016_LAWS+MX_GeneralExchange_Statements_Australia.pdf (listing 'the fundamental question whether the principles of humanity and dictates of public conscience can ever allow machines to select, attack and kill human beings, entirely outside of human control' under the 'ethical approach' to the matter).

[411] https://www.unog.ch/80256EDD006B8954/(httpAssets)/0054AE2FAA24E566C1257F9B004A2CAB/$file/SIERRA+LEONE+GENERAL+STATEMENT+2016+MEETING+ON+LAWS.pdf (considering the Martens Clause as a normative ground against which the legality of LAWS must be assessed, thus *prima facie* attributing legal significance thereto).

[412] https://www.unog.ch/80256EDD006B8954/(httpAssets)/A0B7B1C9846B02F9C125823B00452D57/$file/2017_GGE+LAWS_Statement_Brazil.pdf (arguing for an innovative 'integrated approach to determining the legality of such systems, taking into account the relationship between IHL, International Human Rights Law, and fundamental overarching principles as human dignity. In the case of the CCW, which is primarily a humanitarian instrument, the Martens Clause provides a conceptual platform for bridging these different dimensions and approaches').

[413] https://www.unog.ch/80256EDD006B8954/(httpAssets)/57E7A2A6AEC534B6C125823C00601784/$file/2017_MHCP_Statement_SriLanka.pdf (mixing legal and moral considerations: '[e]ven if any of the existing IHL principles are found to be inapplicable, the test of public conscience and laws of humanity as referred to in the Martens Clause provides compelling reasons for establishing basic guiding principles on the legality of the use of LAWS').

The Martens Clause is a key argument for NGOs that oppose the development of LAWS, such as HRW[414] and ICRAC[415]. In the field of non-state actors, however, a prominent role in this sense has been played by the ICRC: in its statements, the ICRC refers to the 'principles of humanity' and 'dictates of public conscience' as structurally linked with morality,[416] distinct from positive law,[417] but capable of working as a 'portal' that links up morality and law.[418] When it comes to assessing the normative status of the Martens Clause, it seems that the matter has not been clarified properly yet; it would be however hard to contend that IHL-compliant LAWS would

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[414] See *Losing Humanity*, cit., (showing that 'there is certainly a large number for whom the idea is shocking and unacceptable' but that such evidence – which is relevant under the Martens Clause – 'does not create binding law'). HRW importantly restated such idea in its more recent Killer Robots, cit. ('[g]iven the significant doubts about the ability of fully autonomous weapons to conform to the requirements of the law […] the standards of the Martens Clause should *at the very least* be taken into account when evaluating the weapons' legality', italics added).

[415] https://www.unog.ch/80256EDD006B8954/(httpAssets)/029589144209 56E2C1258272005789BE/$file/2018_LAWS6a_ICRAC.pdf (arguing that '[d]ictates of public conscience must always take precedence over any short-term advantage that might be gained from autonomous technologies […] ICRAC reiterates the spirit of the Martens Clause—that morality can provide a strong basis *for new law*', italics added).

[416] https://www.unog.ch/80256EDD006B8954/(httpAssets)/4CE346B40DDBF000C1257E2600616A59/$file/ICRC+general+statement+CCW+LAWS+expert+meeting+13+04+2015+FINAL.pdf (in which the Delegate emphasizes 'the concerns raised by autonomous weapon systems under the principles of humanity and the dictates of public conscience. […] [t]here is a sense of deep discomfort with the idea of any weapon system that places the use of force beyond human control. In this respect, we would like this week to hear the views delegations on the following crucial question for the future of warfare, and indeed for humanity: would it be morally acceptable, and if so under what circumstances, for a machine to make life and death decisions on the battlefield without human intervention?').

[417] https://www.unog.ch/80256EDD006B8954/(httpAssets)/B3834B2C62344053C1257F9400491826/$file/2016_LAWS+MX_CountryPaper_ICRC.pdf ('[t]he fundamental question at the heart of concerns, and *irrespective of whether they can be used in compliance with IHL*, is whether the principles of humanity and the dictates of public conscience would allow machines to make life-and-death decisions in armed conflict without human involvement', italics added). It is implied that 'IHL' and the Martens Clause stand as discrete elements in the ICRC's perspective.

[418] This latter point is well illustrated in the Working Paper submitted for the GGE Session of April 2018, where it is argued that the Martens Clause is the means via which '[c]onsiderations of humanity and the public conscience provide ethical guidance for discussions, and there is a requirement to connect them to legal assessments via the Martens Clause'. See ICRC, *Ethics and autonomous weapon systems: An ethical basis for human control?*, cit., § 73.

be legally proscribed as such. At most, as illustrated by the ICRC, they may raise ethical concerns that need to be translated into legal terms; should this translation not occur, their development and deployment would be permissible under IHL.

Among scholars the relevance of the Martens Clause is contrasted. Some authors argue that the Clause plays an extremely limited role in assessing the legality of LAWS, as positive IHL already covers all the issues that this technology raises.[419] The harshest critic of the Martens Clause is probably Evans, who argues that appealing to 'principles of humanity' and 'dictates of public conscience' has no other purpose than of 'incentiviz[ing] the dissemination of sensationalist, fear-mongering rhetoric aimed at persuading the public, impressionable States or NGOs that the challenged weapons are abhorrent'.[420] On the contrary, others link the 'principles of humanity' and the 'dictates of public conscience' to concepts such as that of human dignity, in an attempt to derive from it a deontological argument against autonomous killing.

To recapitulate, the current state-of-the-art may be summarized as follows. *First*, the Clause is relevant to the debate on LAWS: in this sense, it has been demonstrated that autonomous killing is in contrast with both 'principles of humanity' and 'dictates of public conscience' in their current understandings.[421] *Second*, it is imbued with so many moral considerations

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[419] See for instance Schmitt, *Autonomous weapon systems*, cit., at 32 (contending that rather than being 'an overarching principle', it may at most 'address lacunae in the law', which however is not the case for LAWS).

[420] See Evans, *At War with Robots*, cit., at 727.

[421] See *amplius* HRW-IHRC, *Heed the Call*, cit., 19-43 and *passim*. As for 'principles of humanity', they are construed by taking into account the prohibition on inhumane treatment and the provisions that protect human life and dignity; as for the 'dictates of public conscience', public opinion and positions expressed by States are analyzed with a view to showing that there is widespread aversion towards autonomous killing. Methodologically, the case of LAWS witnesses to an enlargement of law-making actors, as not only States, but also NGOs and other international actors – even civil society! – are considered when assessing 'general practice'. This development, however, seems as of today limited to the branch of IHL, and more specifically to the construction of the principle of humanity as enshrined in the Martens Clause: see *amplius* Cassese, *The Martens Clause*, cit., *passim* (emphasizing *opinio juris* with respect to traditional state practice).

that almost all commentators tend to acknowledge a quite limited normative role. In brief, that the Clause may orient States and other international actors *de jure condendo* seems to be furthest the international discussion can go.

Commenting on this point, however, it does not seem inappropriate to propose a nuanced understanding of the Clause, at least to stimulate further discussion on the topic of its relevance for LAWS. It may be useful, in this sense, to recall Benvenuti's take on the 'principles of humanity' and the 'dictates of the public conscience', i.e. as 'universal, and at the same time *historically* determined foundation' of IHL. As illustrated above (2.1), the idea of *limitation* is somehow inherent in IHL: the 'enemy' cannot be killed (or injured) at any cost.[422] This was made possible by the ideology that shaped IHL back then, namely *humanitarianism*, which aimed (and still aims) at reducing human suffering.[423] Humanitarianism proceeds from a particular, 'historically determined' understanding of 'humanity' as incompatible with (a certain kind of) suffering.[424] In the twentieth century, 'humanity' was then enlarged to include 'human rights', with the relationship between the two (apparently) segregated bodies of law making the object of a long-standing doctrinal debate.[425] Coming to the case of

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[422] See for instance Alexander, *A Short History*, cit., at 115 (citing provisions adopted by the Hague Conferences in a view to showing that by the end of the nineteenth century 'the existence of an unlimited right to injure the enemy' had already been denied).

[423] Key IHL provisions, such as the prohibition of weapons causing unnecessary suffering and superfluous injury, or of indiscriminate weapons, as well as the provisions protecting civilians or combatants temporarily hors de combat, can all be explained in the light of humanitarianism. For a general overview of humanitarianism and its nexus with 'humanity', see *amplius* Fast, *Unpacking the principle of humanity: tensions and implications*, 97 International Review of the Red Cross No. 897/898 (2016), 111-131.

[424] See Coupland, *Humanity: What Is It And How Does It Influence International Law?*, 83 International Review of the Red Cross No. 844 (2001), 969-989 (distinguishing between 'humanity-sentiment' as a form of positive and benevolent disposition and 'humanity-mankind' as the entire group of human beings populating the world); see also Pictet, *Red Cross Principles*, ICRC, 1956, 14-31 (claiming that humanity is 'something understood but not actually expressed'. and that such principle – from which 'all others principles hang' – is 'born of man's love for his fellowmen'.

[425] On this point, see *amplius infra*, Chapter III. See also the position of Larsen, *A 'Principle of Humanity' or a 'Principle of Human-Rightism'?*, in Larsen-Cooper-Nyusten, *Searching for a*

LAWS, it is therefore possible to claim that today's understanding of 'humanity' requires human deliberation to be present at each and every act of using lethal force against individuals. Human control would thus appear as 'something that has historically been taken for granted—assumed but never stated'.[426] It is today, in an historical moment when this nexus risks being radically severed, that a particular understanding of 'humanity' has begun to emerge, and make itself *discernible*.[427] This understanding of the principle of humanity seems not only particularly fitting as far as LAWS are concerned, but also, on a more general plan, consistent with the way international lawmaking is acknowledged to operate.[428]

The question remains whether 'humanity' in this sense – i.e. as 'historically determined' – can be considered as a veritable source of law or remains in the realm of ideals that may at most play a *de jure condendo* role. Conceiving humanity as a value that takes different shapes depending on historical, actual contexts is an argument that goes in the direction of natural-law supporters, who consider 'principles of humanity' and 'dictates of public conscience' as sources of extra-positive law. Closing on this issue, it must be acknowledged that so far few to no scholars that oppose the

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'Principle of Humanity', Cambridge, 2013, 124-148 (showing human rights bodies' current practice of applying both branches of law).

[426] In the words of Asaro, *Jus Nascendi: robotic weapons and the Martens Clause*, in Calo-Froomkin-Kerr, *Robot Law*, Cheltenham-Northampton, 2016, 367-385, at 383.

[427] For further explanation on the natural-law oriented notion of 'discerning', see O'Connell-May, *Sources and the Legality*, cit., particularly at 563 (arguing that international law stemming from natural law is recognizable through a process of discernment that embraces 'the exercise of reason, observation of nature, and openness to trascendence').

[428] See Barile, *Il metodo logico-storico di rilevazione del diritto internazionale non scritto e le sue radici giusnaturalistiche*, 72 Rivista di diritto internazionale No. 1 (1989), 7-26: the Author argues that an historical appraisal of fundamental values have always guided the 'discernment' of legal rules. In the Grotian tradition interpreters are called to 'discover' inner truth that make themselves discernible at a particular point in space and time, and therefore to conform positive law with natural law. In the Author's view, until the XVIII century such methodology was extremely careful about the historical dimension of such values; later, natural lawyers were more inclined to 'inventing' new rules of international law rather than 'elaborating' them having regard to their historical dimension. By doing so, natural-law tradition became spurious, abstract, and eventually *unconvincing*, which led to its relinquishment in favor of legal positivism. This argument is *mutatis mutandis* the same of the one adopted by Benvenuti, *La Clausola Martens*, cit., *passim*.

development of LAWS have resorted to this argument, probably because of a still-widespread skepticism towards natural law: after paving a strong moral way to banning LAWS, it is reiterated that in all cases an *ad hoc* treaty must be adopted.[429] Legally speaking, virtually *everyone* agrees that LAWS as such are not proscribed (yet), and *many* argue that they should be as soon as possible.

2.6 Concluding Remarks

In order for LAWS to be consistent with IHL, they must be developed in accordance with Weapons Law and employed in accordance with Targeting Law. In the foregoing we showed that autonomous killing performed via ATC does not contrast *as such* with IHL; rather, it is possible that technology will develop to a point that ensure adequate – and therefore *acceptable* – levels of compliance with rules of IHL. Arguably the 'technological' argument's days are numbered.

In contrast, a stronger argument has been emerging in the discussions around LAWS, namely that autonomous killing would be incompatible with the principle of humanity as enshrined in the Martens Clause. It is an argument that has undisputed *moral* roots: many actors share this view. However, when it comes to debating the *legal* relevance of such argument, voices become less harmonious and skepticism spreads. In our view, this can be explained by taking account of the traditional, unsolved opposition between natural law and legal positivism: to contend that something is legally prohibited only by virtue of its being morally reprehensible appears unacceptable to most legal scholars today. Hence it is explained why even also those who fiercely oppose autonomous killing do not confine themselves to clarifying the moral and natural-law background of their aversion, but insist on the opportunity of adopting an

[429] In this sense, the position expressed by HRW-IHRC in their 2018 Report, *Heed the Call*, cit., is telling: the concluding Section is named 'The Need for a Preemptive Ban Treaty' (at 44-45).

ad hoc treaty to expressly prohibit LAWS: in a way, mere restatement of extra-positive law is perceived as *insufficient*. In sum, appeals to the 'principles of humanity' and 'dictates of public conscience' serve a *de jure condendo* purpose.

We propose a slightly different argument here: while it is certainly auspicious that the international community reaches an agreement on LAWS, it is possible to argue that the principle of humanity contained in the Martens Clause is a sufficient legal basis for prohibiting LAWS. The power of *opinio juris*, expressed not only by traditional actors (States) but also by new international actors (such as NGOs and civil society at large), coupled with the pressing *moral* imperatives that underlie this reflection, may do. There would be no risk of falling into an ill-placed natural-law argument: construing our methodology in terms of 'discerning' moral imperatives (or, in a more correct terminology: *values*) ensures that the whole reasoning does not get abstract or arbitrary. The point is that according to the current status of the discussion such 'discernment' is not at the horizon *yet*. The moral argument still needs a better construction. The only way forward lies in that States and other actors not only insist in calling for a ban – something that, albeit important, has been made continuously for almost five years! – but also clarify the reasons why it is so vital to prohibit autonomous killing. In a word, that they propose a *principled* reflection on the *values* associated with retaining human presence at the act of applying force against individuals. In our view, this can occur only upon reflection in terms of human *dignity*: it is contrary to one's own dignity (and therefore to the principle of humanity under IHL) to make such individual the object of a lethal decision taken by algorithms and not by humans. Only *when* – and *if* – this proposition is acknowledged as valid, and shared by an adequate number of actors, the 'moral' background will receive *normative* force in keeping with the Martens Clause.

Chapter III

LAWS IN INTERNATIONAL HUMAN RIGHTS LAW

SUMMARY: 3.1 Introduction. – 3.2 Human Rights generally at stake. – 3.3 Human Rights particularly at stake: the Right to Life. – *3.3.1 Preliminary Remarks.* – *3.3.2 Negative Obligations.* – 3.3.2.1 Legality. – 3.3.2.2 Necessity. – 3.3.2.3 Proportionality. – *3.3.3 Positive Obligations.* – 3.3.3.1 The Duty of Precaution regarding the Choice of Weapons. – 3.3.3.2 Duty to Educate and Train Law-Enforcement Officials. – 3.3.3.3 Duty to Investigate and Prosecute. – *3.3.4 'Non-Arbitrariness' as a Way Forward.* – *3.3.5 Right to 'Legibility' and Right Not to Be Subject To Solely 'Automated' Decision-Making as Another Way Forward.* – 3.4 Human Dignity. – *3.4.1 Preliminary Remarks.* – *3.4.2 'Human Dignity' in IHRL.* – *3.4.3 'Human Dignity' in the Debate on LAWS.* – 3.5 Human Dignity and the Principle of Humanity. A Joint Appraisal. – *3.5.1 Theories on the Relationship between IHL and IHRL.* – *3.5.2 The Convergence of IHL and IHRL towards a 'Common Denominator'.* – 3.6 Concluding Remarks.

Fusca sum et decora.
(Tyconius, *The Monza Epitome*, 370-390 AD.)

3.1 Introduction

LAWS' impact on IHRL makes today the object of analysis by an increasing number of scholars.[430] Albeit most emphasis is on armed conflicts – which witnesses to the fact that it is essentially a military-driven technology –, it

[430] Still today legal scholarship on LAWS in the context of IHRL is extremely scarce. This might be due to a foreseeable lack of practical application of LAWS in scenarios other than those of armed conflicts as well as the absence of specific limitations or prohibitions of weapons in that body of law. See Spagnolo, *Human Rights implications of autonomous weapon systems in domestic law enforcement: sci-fi reflections on a lo-fi reality*, 43 QIL Zoom-In (2017), 33-58, at 37; Heyns, *Human Rights and the Use of Autonomous Weapons Systems (AWS) During Domestic Law Enforcement*, 38 Human Rights Quarterly (2016), 350-378, at 353-354. See also HRW-IHRC, *Shaking the Foundation: The Human Rights Implication of Killer Robots*, 2014, available at: https://www.hrw.org/report/2014/05/12/shaking-foundations/human-rights-implications-killer-robots.

has been argued that LAWS will be presumably employed in law-enforcement operations, where the solely applicable regime is IHRL.[431]

As a matter of fact, their predecessors – armed drones – are operated in crowd control, border monitoring, extraterritorial targeted killings almost daily. For the purposes of our analysis, we will consider LAWS operating in the same scenarios of current unmanned systems,[432] without discussing legal issues about how to qualify the relevant operations, especially as far as targeted killings are concerned.[433] As explained in Chapter I, LAWS will presumably function and operate according to a pre-set of algorithms allowing them to take specific decisions in a given environment (ATC). Being able to apply lethal force against human targets, it is somehow implied that LAWS will conduct a preliminary screening of the environment, the objects and the individuals, gathering a certain amount of data; on a later stage, these data will be processed and elaborated in order to take a decision (e.g. to shoot or not to shoot). Mass surveillance and automated processing of data will inevitably be part and parcel of future law enforcement operations, which will incur in a process of 'digitalization'.[434]

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[431] By contrast, in armed conflict the applicable regime is IHL and IHRL, which does not cease to apply. On the relationship between IHL and IHRL, see *amplius infra*.

[432] For a thorough overview of existing technology, see Heyns, *Human Rights and the Use of Autonomous Weapons Systems*, cit., 358-361; Spagnolo, *Human Rights implications*, cit., at 39-42. For the possible employment of autonomous technology in law-enforcement scenarios, see for instance Lundberg-Christensen, *Assessment of Man-portable Robots for Law Enforcement Agencies*, Proceeding of the 2007 Workshop on Performance Metrics for Intelligent Systems, 76-83, available at https://dl.acm.org/citation.cfm?id=1660887 (claiming that the interaction between human agent and unmanned systems proved beneficial also in negotiating scenarios). Surprisingly maybe, studies on the employment of remotely-piloted systems for law-enforcement tasks have been published at very beginning of this century: see Nguyen-Bott, *Robotics For Law Enforcement: Beyond Explosive Ordnance Disposal*, International Symposium On Law Enforcement Technologies, Space And Naval Warfare Systems, 2000, available at https://www.ncjrs.gov/pdffiles1/Digitization/190348NCJRS.pdf.

[433] On this issue scholarship has become so far immense. See *ex multis* Tramontana, *Uccisioni mirate, legittima difesa preventiva e diritti umani*, Diritti Umani & Diritto Internazionale 1/2018, 53-76, and Lubell-Derejko, *A Global Battlefield? Drones and the Geographical Scope of Armed Conflict*, 11 Journal of International Criminal Justice, 2013, 65-88.

[434] See Spagnolo, *Human Rights implications*, cit., at 43.

In the present Chapter the advent of autonomous killing is analyzed through the lenses of IHRL. Attention will be given first to a set of human rights that are as of today affected by massive gathering of personal data and to a certain extent by automated decision-making, namely right to privacy and right not to be discriminated (3.2). Current practice of 'signature strikes' operated through armed drones will be scrutinized in order to draw analogies applicable for LAWS. We will then turn to the right that is particularly at stake when LAWS are involved, that is the right to life (3.3). The object of the discussion will be to shed light on the technological challenges that LAWS need to face in order to be IHRL-compliant. This will eventually lead to a more principled reflection on the topic, which will be addressed from the standpoint of 'human dignity' – a 'meta-principle' of the entire body of IHRL, the 'mother of all rights' – in an attempt to assess whether LAWS technology run *per se* contrary to IHRL (3.4). After joining our findings with what we have argued on the principle of humanity in IHL (3.5), some concluding remarks will be drawn (3.6).

3.2 Human Rights generally at stake

As a preliminary disclaimer, this Paragraph's purpose is to discuss possible implications of LAWS on rights *other* than the right to life. The object of our analysis are autonomous weapons capable of taking decisions resulting in the death of those who receive force: it is therefore a narrower field of interest than analyzing all possible employment of autonomous technology (e.g. non-lethal AWS).

In all cases, the first human right coming to the fore is the right to privacy.[435] LAWS' technology may easily turn out to be a tempting occasion

[435] On the right to privacy generally, see Art. 12 UDHR ('No one shall be subjected to arbitrary or unlawful interference with his privacy, family, home or correspondence, nor to unlawful attacks on his honor and reputation. Everyone has the right to the protection of the law against such interference or attacks'). See also Art. 17 ICCPR and *General Comment No. 16, Article 17*, 8 April 1988; Art. 8 ECHR; Art. 11 ACHR. In the framework of

for governments to establish a constant surveillance upon individuals, especially in the age of terrorist threat.[436] IHRL protects the right not to be subjected to arbitrary or unlawful interference with an individual's privacy, family, home or correspondence as a component of the right to freedom of expression and thought. However, while acknowledging such right as 'one of the foundation of a democratic society',[437] the main international instruments protecting human rights allow for limitations and restrictions to it.[438] As will be shown in the following, even stricter conditions apply when it comes to public authorities putting in place massive surveillance and the systematic collection and storing of data.[439]

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the Council of Europe, of particular importance is the *Modernized Convention for the Protection of Individuals with Regard to the Processing of Personal Data*, adopted by the 128th Session of the Committee of Ministers in Elsinore, Denmark, on 18 May 2018, CM/Inf(2018)15-final (CETS No. 108) (hereinafter: Modernized Convention). The European Union is today at the forefront of the protection of the right to privacy: see art. 8 CFREU; for other EU acts, reference can be made to *Directive 95/46/EC on the protection of individuals with regard to the processing of personal data and on the free movement of such data*; *Council Framework Decision 2008/977/JHA on the protection of personal data processed in the framework of police and judicial cooperation in criminal matters* (recently repelled by Directive (EU) 2016/680) and the topical *Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC* (General Data Protection Regulation; hereinafter: GDPR). For an historical overview of the international provisions protecting the right to privacy, see Della Morte, *Big Data e protezione internazionale dei diritti umani. Regole e conflitti*, Naples, 2018, at 75 ff.. To catch a glimpse of the existing discourse around these practices, see UNGA Res. 68/167, 21 January 2014; OHCHR, *The Right to Privacy in the Digital Age*, Report of 30 June 2014, UN doc A/HRC/27/37.

[436] See for instance UNHCR, *Report of the Special Rapporteur on the promotion and protection of human rights and fundamental freedoms while countering terrorism*, (2014) UN Doc A/69/397 §§ 35 ff..

[437] See UNGA, *The right to privacy in the digital age*, 18 December 2013, UN doc A/RES/68/167, preamble.

[438] See *General Comment No. 16*, cit., § 7 ('[a]s all persons live in society, the protection of privacy is *necessarily* relative', italics added); Art. 8(2) ECHR (listing three parameters for limiting the right to privacy, namely legality, necessity and proportionality).

[439] Such considerations move from the assumption that massive storage of data as well as constant surveillance are dangerous for a democratic society. Decades ago the European Court of Human Rights (hereinafter: ECtHR) acknowledged that 'an unlimited discretion to subject persons within their jurisdiction to secret surveillance' would risk 'undermining or even destroying democracy on the ground of defending it'; see ECtHR, *Klass et al. v. Germany*, No. 5029/71, judgment (plenary), 6 September 1978, § 49. For a discussion on the right to privacy as at particularly at stake when counterterrorism measures are put in place,

Possibly thanks to the pervasiveness of new technologies of data interception and re-elaboration, however, human rights bodies have raised the bar for such practices. For instance, the ECtHR has scrutinized practices such as the interception of private communications and addressed the issue of the developing technologies that allow for growing monitoring and control by State authorities of private activities.[440] In the *Szabó and Vissy* case the Court held that while that 'governments resort to cutting-edge technologies' is 'a natural consequence of the forms taken by present-day terrorism', it would 'defy the purpose of government efforts to keep terrorism at bay … if the terrorist threat were paradoxically substituted for by a perceived threat of unfettered executive power intruding into citizens' private spheres by virtue of uncontrolled yet far-reaching surveillance techniques and prerogatives'.[441] It follows that legal safeguards have to be put in place by States when employing such 'strategic, large-scale interception' of personal data.[442] What should be taken note of is that in assessing the respondent State's safeguards the Court interpreted the requirement of 'necessary in a democratic society' provided for by Art. 8(2) ECHR as requiring the more stringent 'strict necessity' *by reason of* the pervasiveness of the cutting-edge surveillance technologies based on 'automated and systemic data collection'.[443] In short, the rationale the Court leans on seems to be the following: *the more impactful on human rights a surveillance measure is, the more stringent the conditions for the resort thereto need to be*.

In the case of LAWS, the purpose of data collection would be *inter alia* to identify a target for the use of force. In this sense, it would be the right

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see *amplius* Nino, *Terrorismo internazionale, privacy e protezione dei dati personali*, Naples, 2012.

[440] See *Liberty et al. v. the United Kingdom*, judgment, 1 July 2008; *Kennedy v. the United Kingdom*, judgment, 18 May 2010, and more recently *Roman Zakharov v. Russia* [GC], No. 47143/06, judgment, 4 December 2015.

[441] See ECtHR, *Szabó and Vissy v. Hungary*, No. 37138/14, judgment, 12 January 2016, §§ 67-68.

[442] *Ibidem*, § 67.

[443] *Ibidem*, § 73 *in principio* and 67.

to life to be put primarily at stake. It follows that requirements for gathering such personal data need to be far more stringent than in other contexts that have come under the scrutiny of human rights bodies so far. A blanket, massive collection of personal data for law-enforcement purposes would virtually expose every individual, in a given geographical area, to a violation of their right to privacy.

Other human rights that can be impacted by LAWS are the right not to be discriminated against and the right not to be subject to torture or other inhuman or degrading treatment. As for the former, it is widely recognized both in customary and treaty law.[444] Legal scholarship has given much attention to issues of discrimination connected with the employment of emerging technologies, especially algorithms.[445] Arguably the same concerns raise with regard to LAWS, whose ATC methodology must be construed in a way that ensures zero racial or discriminatory bias.[446] As far as the latter,[447] it is acknowledged that the nonlethal but nevertheless excessive use of force by law-enforcement agents constitutes a cruel, inhuman or degrading treatment.[448] As a result, the use of LAWS equipped

[444] See Art. 7 UDHR (standing as 'autonomous right' as well as part of the general clause contained in Art. 1). See also Art. 17 ICCPR; Art. 8 ECHR; Art. 11 ACHR; Art. 2 ACHPR. It is also a cardinal principle of EU law: see Art. 2 TEU, and Arts. 8, 10 TFEU, as well as Art. 21 CFREU.

[445] See *amplius* Della Morte, *Big Data*, cit., *passim*; see also Chander, *The Racist Algorithm?*, 115 Michigan Law Review No. 6 (2017), 1023-1045 (restating the prominence of maintaining human control in order to avoid veiled forms of discrimination).

[446] See Spagnolo, *Human Rights implications*, cit., at 45 (drawing analogies from the US practice of employing algorithms allegedly capable of predicting the defendant's 'level of risk' in criminal proceeding and concluding that '[s]hould similar software be introduced in AWS which are used for law enforcement activities, the risk of discrimination would be high'), and further references therein.

[447] Established as well in treaty and customary law: see Art. 5 UDHR; Art. 7 ICCPR; Art. 3 ECHR; Art. 5 ACHR; Art. 5 ACHPR. The prohibition against torture is universally recognized as a *jus cogens* provision.

[448] For relevant case-law, see *ex multis* ECtHR, *Ribitsch v. Austria*, judgment, 4 December 1995, § 38: 'any use of physical force which has not been made strictly necessary by his own conduct diminishes human dignity and is in principle an infringement of Article 3'. More generally on the implications of using excessive force on the right at issue, see Garanina, *The Police and the Prohibition of Torture and Inhuman or Degrading Treatment or Punishment*, in Alleweldt-Fickenscher, *The Police and International Human Rights Law*, Cham, 2016, at 21-42.

with less-lethal or nonlethal weapons for law-enforcement purposes is subject to the same rules that are normally applicable to existing scenarios.[449] An interesting argument that has been recently put forward is that as LAWS make real-time decisions without human intervention, the force they use would be inherently 'inhuman' inasmuch as applied by a non-human agent.[450] Albeit appealing, in our view this argument seems at best far-fetched. The concept of 'inhuman' has always been interpreted as relating to the *actual treatment* of an individual rather than to the *nature* of the one inflicting such treatment.[451] In other words, it seems that this argument may play a *de jure condendo* role, by inspiring further reflections on the issue; but it cannot be employed to argue that autonomous killing qualify as 'inhuman treatment' in itself.

Having clarified the rights that can be generally affected by LAWS, it is now time to zoom in on the right that is above all impacted by such technology – namely the right to life.

3.3 Human Rights particularly at stake: the Right to Life

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[449] See in particular the *UN Code of Conduct for Law Enforcement Officials*, adopted by UNGA Res. 34/169, 17 December 1979 (hereinafter: Code of Conduct), on which see *amplius infra*, Art. 5: 'No law enforcement official may inflict, instigate or tolerate any act of torture or other cruel, inhuman or degrading treatment or punishment'.

[450] See Heyns, *Human rights and the use*, cit., at 363: '[s]ince machines are not humans, it can be argued that the application of force by a machine to a human being without direct human involvement and appropriate levels of control is inherently, or by definition, "inhuman" treatment').

[451] This can be inferred from existing case-law and scholar literature on the topic. See *ex multis* Greer, *Is the Prohibition against Torture, Cruel, Inhuman and Degrading Treatment Really 'Absolute' in International Human Rights Law?*, 15 Human Rights Law Review No. 1 (2015), 101-137 (testing current interpretation of the prohibition); Webster, *Interpretation of the Prohibition of Torture: Making Sense of 'Dignity' Talk*, 17 Human Rights Review (2016), 371-390 (focusing on the contribution that the discourse around 'human dignity' gives to the interpretation and application of the right not to be subject to cruel, inhuman or degrading treatment); Weissbrodt-Heilman, *Defining Torture and Cruel, Inhuman, and Degrading Treatment*, 29 Law & Inequality (2011), 343-394 (clarifying that differences in the layers of ill-treatment depend on the actual treatment the victim is exposed to, and making the example of the US post-9/11 practice of interrogatories).

3.3.1 Preliminary Remarks

Often referred to as the 'supreme right',[452] the right to life is where any use of lethal force begins.[453] The right to life finds its place in the UDHR[454] as well as in any major human rights treaty – the ECHR,[455] the ICCPR,[456] the ACHR,[457] the AfCHPR.[458] It has gained customary status,[459] and today it is even considered as part of *jus cogens*.[460] Before addressing the right to life from the viewpoint of the use of force it seems appropriate to spend few remarks on the legal regime that ensures its protection. This will help clarify both the *rationale* and the *scope* of the right to life.

First, the right to life has regularly been proclaimed in solemn, high-sounding terms by most treaty norms and scholarship. It is considered as

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[452] See HRC, CCPR General Comment No. 6: Article 6 (Right to Life), 30 April 1982, § 1, and accordingly HRC, *General comment No. 36 (2018) on article 6 of the International Covenant on Civil and Political Rights, on the right to life*, CCPR/C/GC/36 (hereinafter: GC36). See also CCPR, Communication No. 146, 148-154/83, *Baboeram and others vs. Suriname*, View adopted on 4 April 1985, § 14.3; ECtHR (GC), *Streletz, Kessler and Krenz v. Germany*, 22 March 2001, §§ 72, 87 and 94; IACtHR, *Baldéon Garcia vs. Peru*, 6 April 2006.

[453] See O'Connell, *The law on lethal force begins with the right to life*, 3 Journal on the Use of Force and International Law (2016) No. 2, 205-209.

[454] See Art. 3: 'Everyone has the right to life, liberty and security of person'.

[455] See Art. 2: 'Everyone's right to life shall be protected by law. No one shall be deprived of his life intentionally save in the execution of a sentence of a court following his conviction of a crime for which this penalty is provided by law. Deprivation of life shall not be regarded as inflicted in contravention of this Article when it results from the use of force which is no more than absolutely necessary: (a) in defence of any person from unlawful violence; (b) in order to effect a lawful arrest or to prevent the escape of a person lawfully detained; (c) in action lawfully taken for the purpose of quelling a riot or insurrection'.

[456] Art. 6 § 1: 'Every human being has the inherent right to life. This right shall be protected by law. No one shall be arbitrarily deprived of his life'.

[457] Art. 4 § 1: 'Every person has the right to have his life respected. This right shall be protected by law and, in general, from the moment of conception. No one shall be arbitrarily deprived of his life'.

[458] Art. 4: 'Human beings are inviolable. Every human being shall be entitled to respect for his life and the integrity of his person. No one may be arbitrarily deprived of this right'.

[459] See Heyns Report, cit., § 42.

[460] See for instance O'Connell, *The law on lethal force*, at 206; recently Heyns-Probert, *Securing the Right to Life: A Cornerstone of the Human Rights System*, EJIL:Talk! (11 May 2016) www.ejiltalk.org/securing-the-right-to-life-a-cornerstone-of-the-human-rights-system/; Gormley, *The Right to Life and the Rule of Non-Derogability: Peremptory Norms of* Jus Cogens, in Ramcharan (ed.), *The Right to Life in International Law*, Dodrecht-Boston-Lancaster, 1985, 120-159.

an 'essential' right, from which all other rights spring: 'if a person is deprived of his right to life, all other human rights will be meaningless'.[461] As shown by the UDHR's resort to the term 'inherent', there was a discernible sense that the right to life had a solid background in customary law, even in extra-positive law.[462] The right to life holds a central place in the field of human rights, its protection having inspired an immense scholarship to date.[463]

Second, the right to life's paramount importance justifies its characterization as a right not subject to derogation (*i*) and absolute in nature (*ii*).

As for (*i*), it is well acknowledged that no derogation to the right to life is permitted in exceptional situations as armed conflict or public emergencies.[464] The prohibition of derogation from treaty provisions protecting the right to life is set forth explicitly by the ECHR,[465] the ICCPR,[466] and the ACHR,[467] and only implicitly by the AfCHPR. The rationale of such prohibition lies on the circumstance that the right to life is the 'prerequisite

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[461] See Kabaalioğlu, *The Obligations to 'Respect' and 'Ensure' the Right to Life*, in Ramcharan (ed.), *The Right to Life*, cit., 160-181, at 160. In the same line, Przetacznik, *The Right to Life as a Basic Human Right*, 56 Revue de Droit International (1978), 23-47.

[462] See Kabaalioğlu, *The Obligations to 'Respect' and 'Ensure'*, cit., at 161 (citing Lord Dukeston's intervention in the Second Session of the Commission on Human Rights according to which the right to life was 'part of the law of nature which was the foundation of all law and international law'; see more extensively E/CN.4/SR.41, 16 December 1947).

[463] See *ex plurimis* Dinstein, *The Right to Life, Physical Integrity, and Liberty*, in Henkin (ed.), *The International Bill of Rights, The Covenant on Civil and Political Rights*, New York, 1981, 114-137.

[464] See GC36, § 1. For HRCt's case law, see Communication No. R.11/45, *Suarez de Guerrero v. Colombia*, Views adopted on 31 March 1982, § 13.1; Communication No. 146/1983, *Baboeram Adhin v Suriname*, Views adopted on 4 April 1985, § 14.3.

[465] Art. 15(2): 'No derogation from *Article 2*, except in respect of deaths resulting from lawful acts of war, or from Articles 3, 4 (paragraph 1) and 7 shall be made under this provision'.

[466] Art. 4(2): 'No derogation from *Articles 6*, 7, 8 (paragraphs I and 2), 11, 15, 16 and 18 may be made under this provision'.

[467] Art. 27(2): '[t]he foregoing provision does not authorize any suspension of the following articles: […] Article 4 (Right to Life)'.

for the enjoyment of all other human rights' and therefore 'has crucial importance both for individuals and for society as a whole'.[468]

As for (*ii*), the right to life is generally considered as absolute in nature. What 'absolute' actually means with the respect to the right to life is however open to debate. For instance, General Comment No. 36 claims that '[a]lthough it inheres in every human being, the right to life is not absolute'.[469] The subsequent *relative* character is due to the circumstance that Art. 6 ICCPR allows for deprivations of life on condition of being 'non-arbitrary'. On the contrary, several authors consider the right to life as absolute in that 'human life may lawfully be taken in certain restrictive situations consistently with the right to life'.[470] The issue is an interpretive one that can be easily solved as follows: the right to life as recognized by the relevant norm (ICCPR, ECHR, custom, etc.) is absolute *as a whole*. In other words, conditions for its (lawful) deprivation are thus part and parcel of the absolute character of the right. As will be shown below, this has an restrictive impact on the interpretation of these conditions, in line with the traditional maxim *exceptiones sunt strictae interpretationis*.

Third, the right to life encompasses not only negative duties (i.e. not to arbitrarily deprive someone's life) but also *positive* duties (i.e. to ensure the enjoyment of it to all concerned individuals). 'Positive obligations' is how legal scholarship generally refers to these duties.[471] Encapsulated in the

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[468] See GC36, § 1. See also ECtHR (GC), *Makaratzis v. Greece*, 20 December 2004, § 56: 'Article 21 […], which safeguards the right to life and sets out the circumstances when deprivation of life may be justified, ranks as one of the most fundamental provisions in the Convention, from which no derogation is permitted ... Together with Article 3, it also enshrines one of the basic values of the democratic societies making up the Council of Europe'.

[469] See GC36, § 16.

[470] See O'Connell, *The right to life begins*, cit., at 206.

[471] See *ex multis* Shelton-Gould, *Positive and Negative Obligations*, in Shelton (ed.), *The Oxford Handbook of International Human Rights Law*, Oxford, 2013, 562-585; Klatt, *Positive Obligations under the European Convention on Human Rights*, 71 Zaörv (2011), 691-718, at 692; Fredman, *Human Rights Transformed. Positive Rights and Positive Duties*, Oxford, 2008; Borelli, *Positive Obligations of States and the Protection of Human Rights*, 15 Interights Bulletin 1 (2006), 101-103; Mowbray, *Human Rights Law in Perspective: The Development of Positive Obligations under the European Convention on Human Rights by the European Court of Human Rights*, Hart Publishing, 2004.

more general obligation to 'ensure' the rights contained in a treaty,[472] positive obligations complete and fulfill the basic duty to refrain from taking one's life: they are the product of a – necessarily wide – interpretation of the 'inherent' right to life.[473] Such affirmative action consists of both a duty to protect life (3.2.3) and a duty to conduct investigations once a loss of life has occurred (3.2.4).

Having clarified the right to life's scope, it is now time to narrow down our analysis to the use of force. We will focus on (both negative and positive) obligations incumbent on States when resorting to lethal force against individuals. Law-enforcement scenarios, either domestically or extraterritorially, will thus be under our scrutiny. The subject matter – at times referred to as 'law of law enforcement',[474] in a questionable, fragmentary approach – is today made up of treaty law as interpreted by relevant monitoring bodies, as well as customary norms and general principles of law, most of which are reflected in the 1979 Code of Conduct for Law Enforcement Officials[475] and the 1990 Basic Principles on the Use of Force and Firearms by Law Enforcement Officials (hereinafter: UN Basic

[472] See Art. 2(1) ICCPR ('[e]ach State Party to the present Covenant undertakes to respect and to *ensure* to all individuals within its territory and subject to its jurisdiction the rights recognized in the present Covenant'; Art. 1 ECHR ('The High Contracting Parties shall *secure* to everyone within their jurisdiction the rights and freedoms defined in Section I of this Convention'); Art. 1(1) ACHR ('The States Parties to this Convention undertake to respect the rights and freedoms recognized herein and to *ensure* to all persons subject to their jurisdiction the free and full exercise of those rights and freedoms'); Art. 1(1) ACHPR ('[t]he Member States of the Organization of African Unity parties to the present Charter shall recognize the rights, duties and freedoms enshrined in this Chapter and shall *undertake to adopt* legislative or other measures *to give effect* to them'). See *amplius* Kabaalioğlu, *The Obligations to 'Respect' and 'Ensure'*, cit., at 161 and *passim*.

[473] The HRC has repeatedly stated that the right to life should not be narrowly interpreted, and that the expression 'inherent right to life' cannot be properly understood in a restrictive manner. See GC36, cit., § 3 *in principio*; Communication No. R.11/45, *Maria Fanny Suarez de Guerrero v. Colombia*, U.N. Doc. Supp. No. 40 (A/37/40) at 137 (1982), 31 March 1982, § 93.

[474] See *Use of Force in Law Enforcement and the Right to Life: The Role of the Human Rights Council. Academy In-Brief No. 6*, published by the Academy of International Humanitarian Law and Human Rights, Geneva, November 2016, at 5. See also Casey-Maslen (ed.), *Weapons under International Human Rights Law*, Cambridge, 2014, at xvi–xvii.

[475] Adopted by UN General Assembly Resolution 34/169 of 17 December 1979; they have been already cited *supra*.

Principles).[476] Albeit *per se* void of binding force, they have been referred to by monitoring bodies on numerous occasion, which renders some of the most important provisions on the use of force contained therein of a customary nature.

3.3.2 Negative Obligation

In the words of the HRC's first General Comment on the Right to Life, '[t]he deprivation of life by the authorities of the State is a matter of the utmost gravity. Therefore, the law must strictly control and limit the circumstances in which a person may be deprived of his life by such authorities'.[477] Deprivation of life must occur in accordance with the principles of: (*1*) legality; (*2*) necessity and (*3*) proportionality.

3.3.2.1. Legality

The first tenet of the negative obligation stemming from the right to life is thus the prohibition of taking one's life absent a legal basis: we can call this the principle of *legality*.[478] The deprivation of life must result from the exercise of a power that is provided either in domestic law or in international law, or both. Art. 6(1) ICCPR,[479] Art. 2(1) ECHR,[480] and Art. 4(1) ACHR[481] all require expressly a legal basis, whereas the ACtHPR does not.[482]

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[476] Adopted by the Eighth United Nations Congress on the Prevention of Crime and the Treatment of Offenders, Havana, Cuba, 27 August-7 September 1990.

[477] HRC, *General Comment No. 6*, cit., §3.

[478] In this context the principle of legality is different from the principle *nullum crimen, nulla poena sine lege* which as well constitutes a basic human right protected by treaty and customary law.

[479] 'This right shall be protected by law'.

[480] 'Everyone's right to life shall be protected by law'.

[481] 'This right shall be protected by law and, in general, from the moment of conception'.

[482] It is however recognized implicitly: see for instance ACommHPR, *General Comment No. 3 on the African Charter on Human and Peoples' Rights: The Right to Life (Article 4)*, § 7: 'States have a responsibility under the Charter to develop and implement a legal and practical framework to respect, protect, promote and fulfil the right to life'.

The existence of a legal and regulatory framework for the use of lethal force is thus a prerequisite for a lawful resort to it. The UN Basic Principles thoroughly indicate that such framework must be sufficiently detailed and describe which arms and ammunition is permitted in a given circumstance.[483] Regional and universal monitoring bodies have consistently recalled the importance for law-enforcement authorities to be provided with an appropriate operative framework.[484]

In this respect, the use of LAWS can be consistent with the principle of legality as long as an appropriate normative (i.e.: legal and regulatory) framework is put in place by State authorities. It does not seem that their introduction will impact negatively on the rule of legality; rather, these issues – autonomous killing and the requirement of legality – place themselves on discrete plans.

3.2.2.2 Necessity

The prominent principle governing the actual use of force is the principle of *necessity*, which requires that lethal force be resorted to 'only… when *strictly unavoidable* in order to protect life'.[485] As inferable from the letter of Art. 2(1) ECHR, necessity has to be interpreted in the light of a strict and compelling test, namely as 'absolute necessity'. Such expression marks the difference between the necessity test under the right to life and other human rights provisions such as the right to privacy or the freedom of expression.[486]

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[483] See *UN Basic Principles*, cit., § 1.

[484] See for instance ECtHR, *Tagayeva and Others v. Russia*, judgment, 13 April 2017, §§ 592-599 (concluding that the absence of a sufficiently strong regulatory framework 'bears a relevance' on the issue of proportionality); *Giuliani and Gaggio v. Italy*, No. 23458/02, judgment, 24 March 2011, § 209 (affirming that the protection of the right to life necessitates 'an appropriate legal and administrative framework defining the limited circumstances in which law enforcement officials may use force and firearms, in the light of the relevant international standards'); *Makaratzis v. Greece* [GC], no. 50385/99, §§ 56-59, ECHR 2004-XI; *McCann and Others*, § 150.

[485] See *UN Basic Principles*, cit., § 9 *in fine*.

[486] See ECtHR, *Giuliani and Gaggio vs. Italy*, No. 23458/02, 24 March 2011, § 176 (affirming that 'a stricter and more compelling test of necessity must be employed than that normally applicable when determining State action is "necessary in a democratic society" under paragraph 2 of Articles 8 and 11 of the Convention').

The principle of necessity is thus built upon two foundations: (*i*) the absence or unavailability of less-lethal means, making the resort to lethal force an *extrema ratio*; (*ii*) the existence of a legitimate purpose for resorting to lethal force.[487]

As for the first, law-enforcement officials are required to exhaust non-violent means (such as persuasion, negotiation and mediation) before using lethal force.[488] Should such non-violent means prove inadequate and ineffective, then precedence must however be given to less-lethal means capable of neutralizing the individual without taking his life.[489] This lead inevitably to the conclusion that even potentially violent suspects should be arrested than killed, when such less-lethal option is viable and reasonable according to the circumstances of the case.[490] Temporal considerations may play a decisive role in assessing whether the use of lethal force satisfies the requirement of 'absolute necessity' under this tenet. 'Ticking bomb' scenarios are illustrative. When split-second decisions must be taken to neutralize an individual posing a grave and imminent risk to bystanders, less-lethal means may be unavailable and resort to lethal force turns out to be the only effective solution.[491]

As for the second, importance must be attached to the aims that the actual use of lethal force is intended to achieve. These aims are at times

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[487] See *UN Basic Principles*, cit., § 4: 'Law enforcement officials, in carrying out their duty, shall, as far as possible, apply non-violent means before resorting to the use of force and firearms. They may use force and firearms only if other means remain ineffective or without any promise of achieving the intended result'.

[488] Ibidem, at 7. For a practical application of this rule, see ECtHR, *Shchiborshch and Kuzmina vs Russia*, Judgment, 16 January 2014, § 238 (apparently suggesting that a law enforcement official should wait for appropriate resources to arrive *in loco* before exerting lethal force).

[489] Focusing on the ECtHR's case-law, see: *Finogenov and Others vs. Russia*, §§ 231-236 (dealing with gas); *Khamzayev and Others vs. Russia*, judgment, 3 May 2011, § 185 (for a case involving fragmentation bombs); *Stewart vs. the United Kingdom*, No. 10044/82, decision, 10 July 1984, §§ 28-30 (for a case involving rubber bullets).

[490] See HRCttee, *Suarez de Guerrero v Colombia*, Views, Comm no R.11/45, 9 April 1981, Supp No. 40 (A/37/40) at 137 ; IACtHR, *Nadege Dorzema et al v Dominican Republic*, judgment (Merits, Reparations and Costs), 24 October 2012, §85 (iii); Code of Conduct, art. 3 (Commentary); Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns, A/HRC/26/36, 1 April 2014, § 59.

[491] See ECtHR, *McCann v. the United Kingdom*, § 74.

listed in the applicable treaty provision, as is with respect to the ECHR;[492] at times they are not – as is for the ICCPR –, resulting in a necessary intervention by the relevant monitoring body.[493] The UN Basic Principles, as well as the Code of Conduct and other soft-law instruments all require a legitimate aim to be present at each and every use of lethal force against an individual.[494]

Applying these findings to LAWS, the question is whether the absence of human decision-making at the single use of force in itself runs contrary to the principle of necessity. For instance, some contend that as machines they have 'no capacity to *read the intention* of suspects, an element that is important when deciding to use certain force against the suspect': LAWS would then be unable to comply with the requirement *de quo*.[495] So the problem might be rephrased as follows: if a LAWS is developed that can

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[492] See Art. 2(2) ECHR: '(a) in defence of any person from unlawful violence; (b) in order to effect a lawful arrest or to prevent the escape of a person lawfully detained; (c) in action lawfully taken for the purpose of quelling a riot or insurrection'. The list is considered as *numerus clausus*; see Schabas, *The European Convention on Human Rights. A Commentary*, Oxford, 2015, at 147 (arguing that because of such strict approach 'there will inevitably be disputes about whether this was the genuine intent of the authorities'). A similar drafting was proposed (unsuccessfully) at the Commission on Human Rights during the *travaux préparatoires* of the ICCPR: see *amplius* Boyle, *The Concept of Arbitrary Deprivation of Life*, in Ramcharan, cit., 221-244, at 227 *passim*.

[493] See UN doc. CCPR/C/79/Add. 39, § 6.

[494] See *UN Basic Principle*, cit., § 9 ('to prevent the perpetration of a particularly serious crime involving grave threat to life, to arrest a person presenting such a danger and resisting their authority, or to prevent his or her escape'); Code of Conduct, art. 3 ('[l]aw enforcement officials may use force only when strictly necessary and to the extent required for the performance of their duty', the Commentary specifying that the aims are: 'prevention of crime'; 'effecting or assisting in the lawful arrest of offenders or suspected offenders'); Council of Europe's 2001 European Code of Police Ethics, adopted by the Committee of Ministers of the Council of Europe on 19 September 2001, §37, http://polis.osce.org/library/f/2687/500/CoE-FRA-RPT-2687-EN-500 (stipulating that law-enforcement officials may resort to lethal force 'only to the extent required to obtain a legitimate objective').

[495] See Chengeta, *Can Robocop 'Serve and Protect' within the Confines of Law Enforcement Rules?*, 1 March 2014 (unpublished), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2755188, 1-51, at 13, italics mine (focusing on the fact that LAWS 'lack the human qualities and ability to exercise human judgment when it comes to ascertaining whether a certain action is necessary or not').

'read' such intentions, then the necessity requirement will be respected in principle. The abovementioned objection to LAWS is thus 'technological'.

It seems appropriate however to dwell upon this point a bit more, as it has several implications on the importance of human decision-making. It is possible to draw an analogy from the parallel issue of surrender during armed conflict.[496] As a matter of fact if the goal of a law-enforcement operation is 'maintaining public order and security, preventing and detecting crime, and providing assistance',[497] and if resort to lethal force is an *ultima ratio* choice, negotiation plays a key role as it allows for preventing the commission of a crime without depriving the suspect of his/her life. The UN Basic Principles stress the importance of having law-enforcement officials properly trained and educated in this sense.[498] Provided that once LAWS are fielded it will be them that face individuals, it will be vital to have them endowed with the power to request (and accept)[499] surrender.

Arguably the feasibility of LAWS requesting surrender for the purposes of IHL is hotly disputed. For instance, Sparrow claims that recognition is a 'hard problem' for LAWS for two reasons mainly: first, it requires perception, a 'notoriously hard task' for computers; second, it requires understanding the significance of context, which involves distinguishing genuine surrender from 'fake' surrender.[500] However, for LAWS supporters the argument remains that all that should be asked to the machine is to perform '*at least* as well as human warfighters'.[501]

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[496] On which see *amplius supra*, Chapter II.

[497] See *Violence and The Use of Force*, published by the ICRC, July 2011, available at https://www.icrc.org/eng/assets/files/other/icrc_002_0943.pdf, at 40.

[498] See *UN Basic Principles*, cit., § 20 (using the terms 'peaceful settlement of conflicts' and 'methods of persuasion, negotiation and mediation').

[499] The issue of LAWS being able to accept surrender has been left unexplored in armed conflict. In law-enforcement operations however surrender is always available to suspects as by so doing they cease constituting a threat to the society and can be arrested.

[500] See Sparrow, *Twenty Seconds to Comply*, cit., at 705-709 (underscoring the natural superiority of human brain in interpreting the actions of other human being and identifying their possible intentions, and claiming that for a machine to come close to replicating such behavior is 'extremely challenging').

[501] See id., at 709, italics mine. Such approach is followed and defended by Arkin, *The Case for Ethical Autonomy*, cit., *passim*.

Let us imagine a scenario where a LAWS is confronting a suspect, say barricaded in a compound, armed and shooting at bystanders entering his/her line of sight.[502] In order for the principle of necessity to be respected insofar as requiring use of lethal force as last resort, the LAWS must be capable of approaching the suspect, ordering surrender and, if s/he does not, preventing him/her from posing further threats. In this last case, it may be contended that as a LAWS does not risk any personal injury (in the sense in which a human agent would) it might even allow the suspect to shoot at it before opening fire, or that in any case it must be equipped with less-lethal weapons solely.[503] This would ensure more compliance with the rule of necessity, but as will be argued later also the use of less-lethal weapons may result in a death in given circumstances, which does not remove the problem of LAWS's compliance with the principle under observation.

What seems to be undisputed is that, pursuing the human/machine comparison, if a certain standard of conduct is lawful when adopted by a human agent, and if a LAWS is deployed that ensures the *same* level of performance of a human agent, then the deprivation of life resulting from the use of such LAWS may be considered lawful as well. Albeit technologically difficult to develop, LAWS ensuring a reasonable level of performance when dealing with human suspect, say in split-second-

[502] A scenario not different from the one that took place in June 2016 in Dallas, Texas, when a suspect, Mr. Johnson, that had been the author of the shooting of several bystanders at a 'Black Lives Matter' manifestation was cornered by the police in a parking garage. From that position he could shoot at bystanders as he had a loaded rifle with him. So when negotiations broke down, the chief of the police authorized using a bomb disposal robot to deliver C4 explosive for the purpose of blowing him up. For a comment on the lawfulness of the law-enforcement officials' conduct on that occasion, see O'Connell, *Remote-Controlled Killing in Dallas*, in EJIL:Talk!, 19 July 2016, available at https://www.ejiltalk.org/remote-controlled-killing-in-dallas/.

[503] See for instance, and *mutatis mutandis*, Sparrow, *Twenty Seconds to Comply*, cit., at 705-709.

decision scenarios,[504] would be compliant with the principle of necessity on the basis of the existing IHRL rules.[505]

3.2.2.3 Proportionality

As the Commentary on Art. 3 of the UN Code of Conduct explains, 'in no case' force can be authorized 'which is *disproportionate* to the legitimate objective to be achieved'.[506] In order to properly understand what proportionality entails in law-enforcement scenarios, two considerations must be shed light on.

First, the principle of proportionality comes into play only 'when the principle of necessity has been met'.[507] The close connection between necessity and proportionality has been duly outlined by the ECtHR elsewhere.[508] The UN Basic Principles and international case-law establish that an unavoidable resort to force is prerequisite for a proportionality assessment:[509] the fact that law enforcement officials may be granted recourse to lethal force does not entail 'that any degree of force may be used'.[510]

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[504] As it allegedly was in the Dallas episode recalled *supra*, at least according to the police chief's comments released just after the killing of the suspect. The circumstance is however contrasted; see O'Connell, *Remote-Controlled Killing*, cit. (arguing that '[p]olice knew no police or bystanders would be harmed in any way by their bomb. They also knew that any explosives Johnson had were not on his person or nearby, or else they would not have risked bombing him. In other words, police had no immediate need to kill Johnson').

[505] In this sense, it seems to us that it is correct to argue for the existence of a 'duty to individuate the use of force under IHRL': see Brehm, *Defending the Boundary*, cit., at 45-49. The Author's analysis is well detailed and tackles different scenarios where LAWS may be unlawful.

[506] Commentary (b) on Art 3, 1979 Code of Conduct.

[507] See *Use of Force in Law Enforcement and the Right to Life: The Role of the Human Rights Council. Academy In-Brief No. 6*, at 9.

[508] ECtHR, *Handyside vs. the United Kingdom*, judgment, 7 December 1976, § 58 ('[t]he United Kingdom was said to have violated the principle of proportionality, inherent in the adjective "necessary"…').

[509] See UN Basic Principles, § 5: '[w]henever the lawful use of force and firearms is unavoidable, law enforcement officers shall … act in proportion to the seriousness of the offence and legitimate objective to be achieved';

[510] See Boyle, *The Concept of Arbitrary Deprivation of Life*, in Ramcharan, cit., at 240.

Second, the guiding star in assessing whether the amount of force employed was disproportionate is the 'legitimate purpose' to be achieved. Again, this requires the force to be calibrated on a case-by-case basis. For instance, on several occasions human rights bodies have maintained that even though law-enforcement agents may use force to prevent a suspect from escaping, such use of force is not unconstrained, especially when the suspect is not posing an actual threat to another's life.[511] Moving from such a notion of proportionality, it is quite unsurprising that the international practice has evolved towards a final ground of justifying deliberate deprivations of life corresponding to the 'protect life' principle.[512] This principle has finally found recognition by the UN Basic Principles.[513]

As is in armed conflict, the principle of proportionality requires a balancing calculation: in IHRL terms, and namely when it comes to the right to life, the balance to be struck is between the amount of force (lethal, less-lethal, no force) on the one hand and both 'the seriousness of the offense and the legitimate objective to be achieved'.[514] Again, this is a matter of establishing whether the principle of proportionality *by itself* demands human deliberation at the act of striking such balance. If one imagined a LAWS operating in the same scenarios that have been under scrutiny by human rights bodies, it would be hard to reach a completely divergent

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[511] See *ex multis* ECtHR [GC], *Nachova v Bulgaria*, judgment, 6 July 2005, § 95 (finding that an escaping suspect who does not pose a threat to life may not be shot 'even if a failure to use lethal force may result in the opportunity to arrest the fugitive being lost'); [Comm], *Farrell v the United Kingdom*, decision, 11 December 1982 (stressing that the purpose of arresting could not justify a deliberate decision to kill absent any immediate threat to life). But note [Comm], *M.D. v. Turkey*, Decision, 30 June 1997 (considering that the shooting of a terrorist bombing suspect who was escaping met the terms of the exception set out in Art. 2(2)(b) ECHR).

[512] See Heyns Report, cit., § 70 (describing this as 'the guiding star of the protection of the right to life'). See also O'Connell, *The law on lethal force*, cit., at 206 ('to save life immediately'); Boyle, *The Concept of Arbitrary Deprivation of Life*, cit., at 241-242 (commenting on early drafts of Art. 6 ICCPR and namely a French-Lebanese proposal based on the standard of 'danger to human life', and explaining how such position was not supported by most domestic systems back then). For the text of that proposal, see E/CN.4/SR.93.

[513] *UN Basic Principles*, cit., § 9.

[514] See Chengeta, *Can Robocop Serve and Protect*, cit., at 17.

conclusion only because no human deliberation had been present at the act of using lethal force.

ECtHR's case-law can offer some telling examples; we will pick out some relating to the three grounds for permitted use of lethal force set forth at Art. 2(2) ECHR in order to demonstrate that case-law's findings on the lawfulness of the use of force rely on a situational judgment depending on what the 'applier' of force perceived, which seems per se compatible with that 'applier' being a non-human agent.

Considering 'defense from unlawful violence' (Art. 2(2)(a) ECHR) it is important to consider what follows. In a case involving a law-enforcement operation aimed at neutralizing an armed man who was about to shoot at some agents, the Court affirmed that 'the use of lethal force in the circumstances of this case, albeit highly regrettable, was not disproportionate and did not exceed what was absolutely necessary to avert what was *honestly perceived* … to be a real and immediate risk to his life and the lives of his colleagues'.[515] *Mutatis mutandis*, it is clear that a LAWS would not act in self-defense as it does not risk its life. However, it seems unlikely that given the costs of the machine States will not consider the opportunity to allow LAWS to fire back, at least when the force used against them is likely to destroy them. In any case, even in the case that LAWS will be prevented from firing back, it will act to defend others (e.g. an hostage, a potential target…) from unlawful violence, so the Court's assessment remains valid. The parameter the Court resorted to in order to assess the lawfulness of the law-enforcement official's action was 'honest perception' or 'honest belief'. It is a well-established standard in such kind of cases;[516]

[515] See ECtHR, *Bubbins v. the United Kingdom*, No. 50196/99, judgment, 17 March 2005, §§ 140, 152.

[516] The test was first set in *McCann and Others*, cit., § 200 ('[t]he use of force by agents of the State in pursuit of one of the aims delineated in paragraph 2 of Article 2 of the Convention may be justified under this provision where it is based on an honest belief which is perceived, for good reasons, to be valid at the time but which subsequently turns out to be mistaken. To hold otherwise would be to impose an unrealistic burden on the State and its law-enforcement personnel in the execution of their duty, perhaps to the detriment of their

obviously it is meant to apply to human agents. As elaborated in the *Armani da Silva* case – probably the most important judgment in this field –, such standard is a subjective one, meaning that 'the *reasonableness* of a belief in the necessity of lethal force' must be determined having regard to 'the *position* of the person who used lethal force'.[517]

Applying these categories to LAWS, for compliance with the right to life it may be sufficient to demonstrate that given the actual situation the LAWS was operating within, its system worked in a way that would appear *reasonable* to human judgment *ex post*. This implies that there must be some form of 'reporting', 'feedback-based' mechanisms that can be checked in order to assess why and how a LAWS conducted as it did. In particular, such conduct must be comprehensible and understandable to rational agents. So if a human agent could: (*i*) access to the LAWS; (*ii*) check recorded data; (*iii*) assess system's performance; and then (*iv*) compare the results with an hypothetical human-agent-ruled scenario, should he find that the LAWS acted as that human agent would, the requirement of proportionality would be respected. The same goes with respect to the legitimate aims of effecting a lawful arrest or preventing escape (Art. 2(2)(b)) as well as quelling riot or insurrection (Art. 2(2)(c)). 'Reasonableness' again is the standard against which the (necessity and) proportionality of the use of force is measured against.[518]

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lives and those of others'). See for instance ECtHR, *Yüksel Erdoğan and Others v. Turkey*, No. 57049/00, judgment, 15 February 2007, § 97

[517] See ECtHR [GC], *Armani Da Silva v. the United Kingdom*, No. 5878/08, judgment, 30 March 2016, §§ 244-248, italics mine (case concerning the fatal shooting of a Brazilian national mistakenly identified by the London police as a suicide bomber). Albeit the case concerns the issue of putative self-defense, it provides for some indicators that are of use for our purposes too.

[518] See *Perk and Others v. Turkey*, no. 50739/99, judgment, 28 March 2006, § 68 ('les policiers pouvaient raisonnablement estimer qu'il fallait tenter de pénétrer dans l'appartement, désarmer les intéressés et les arrêter. En outre, lorsque les policiers sont entrés dans l'appartement en question, il est raisonnable de penser qu'ils ont jugé nécessaire de tirer jusqu'à ce que les suspects armés ne soient plus physiquement en mesure de riposter par des coups de feu').

In conclusion, according to existing case-law it cannot be excluded that the use of LAWS will comply with the negative obligation stemming from the right to life. While it is undeniable that current standards of 'reasonableness', 'honest belief' or 'honest perception' have been elaborated having in mind the human agency of the applier of lethal force, there seems to be no real obstacle in applying the same standards to LAWS, provided that they ensure at least a comparable level of performance. Yet it is more than understandable that such requirement is a very demanding one for machines, as it requires an advanced situation-awareness that may take years, if not decades to be successfully developed for A.I.. This is why most commentators agree that LAWS will not be able to perform as humans do, at least in the near future.[519] Legally speaking, however, human deliberation is *not* a requirement for compliance with the rule of proportionality – as is neither for the rule of necessity nor for the rule of legality.

3.3.3. Positive Obligations

Negative and positive obligations cannot be treated as separated, non-communicating sets of duties incumbent on States; in some circumstances positive obligations are 'inherent' in the negative obligations.[520] Rather, they complete each other in a way that renders the protection of the right to life 'practical and effective'.[521] This is why it has been said that '[w]hen lethal force is used within a "policing operation" by the authorities it is difficult to separate the State's negative obligations … from its positive

[519] See Chengeta, *Can Robocop Serve and Protect*, cit., at 14-18; Spagnolo, *Human Rights implications*, cit., at 48; Heyns, *Human Rights and the Use of Autonomous Weapons Systems*, cit., at 364-365.

[520] See ECtHR, *Verein Gegen Tierfabriken Schweiz (Vgt) v. Switzerland (No. 2)*, No. 32772/02, judgment, 30 June 2009, § 79 (stating that 'in addition to the primarily negative undertaking of a State to abstain from interference in Convention guarantees, "there may be positive obligations inherent" in such guarantees' and quoting previous case-law);

[521] See among others ECtHR, *Öneryildiz v Turkey*, No. 48939/99, judgment, 30 November 2004, § 69 ('the Court reiterates, firstly, that its approach to the interpretation of Article 2 is guided by the idea that the object and purpose of the Convention as an instrument for the protection of individual human beings requires its provisions to be interpreted and applied in such a way as to make its safeguards practical and effective').

obligations'.[522] The obligation to 'respect' and 'ensure' the right to life implies a complex set of duties which in line with the IACtHR's findings[523] can be distinguished in two macro-areas: duties of precaution (*1*) and investigation (*2*).

3.3.3.1 The Duty of Precaution regarding the Choice of Weapons

The precautionary principle requires the public authorities to plan law-enforcement operations in a manner that reduces the risk of deprivations of life. As such it operates *ex ante*, that is before the actual employment of lethal force and with a view to minimizing the resort thereto.

The positive duty of precaution was asserted for the first time by the ECtHR in the famous *McCann* case.[524] In assessing the shooting of three members of the Irish Resistance Army (suspected of having on them a remote control device to be used to detonate a bomb nearby) by Special Air Service soldiers in Gibraltar, the Court find a violation of the right to life in that the UK authorities had failed to take 'appropriate care in the control and organization' of the operation.[525] Other human rights bodies have repeatedly required the respect of precautionary rules when planning the use of force against individuals.[526] The UN Basic Principles as a whole revolve around the principle of precaution.

The duty of precaution also covers an aspect of paramount importance in the debate around LAWS, namely law-enforcement official's choice of weapons and ammunitions. To begin with, regulation of arms and caution in the employment thereof are the sign of a 'democratic society'.[527]

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[522] See ECtHR, *Finogenov and Others v. Russia*, cit., § 208.

[523] See *Velásquez Rodríguez case*, 29 July 1988, judgment, Inter-Am.Ct.H.R. (Ser. C) No. 4 (1988), §§ 166 ff..

[524] ECtHR, *McCann v. the United Kingdom*, judgment, 27 September 1995.

[525] Ibidem, § 212 *in fine*.

[526] See IACtHR, *Nadege Dorzema et al v Dominican Republic*, cit., §87 (linking the principle of precaution with the principle of proportionality, and stressing how the former 'is also related to the planning of preventive measures, since it involves an assessment of the reasonableness of the use of force').

[527] See ECtHR, *McCann v the United Kingdom*, § 212.

As a matter of fact, using a given weapon instead of another does have an cross-cutting impact on positive and negative obligations regarding the right to life. Intuitively enough, the use of a weapon that is not appropriate in the context raises issues in terms of necessity, proportionality, and precaution.

The UN Basic Principles stipulate that State officials must be provided with adequate equipment, in particular alternative weapons to firearms in order to ensure a differentiated use of force.[528] With respect to the choice of the single weapons and ammunitions, human rights bodies have elaborated a substantial case-law. The Commission of Inquiry in Syria (established within the framework of the Human Rights Council) has issues reports condemning the use of snipers, IEDs, shelling and fragmentation mortar bombs, chemical and thermobaric weapons, barrel bombs, missiles and cluster munitions.[529] The IACmHR[530] and the HRC[531] as well have dealt with parallel cases involving the use of powerful weapons by State agents.

On this particular point the ECtHR has developed an indicative case-law.[532] *First*, it has found that resort to indiscriminate weapons[533] is generally in contrast with the duty to take 'all feasible precautions with a view to

[528] See *UN Basic Principles*, cit., § 2.

[529] To cite one, see HRC, *Report of the Independent International Commission of Inquiry on the Syrian Arab Republic*, A/HRC/36/55, *passim*.

[530] Report No. 25/03, Santo Domingo Colombia, Petition 289/2002 of 6 March 2003 (for a case involving the use of cluster munitions).

[531] See CCPR/C/79/Add.93, 18 August 1998, Concluding Observations: Israel, § 17 (urging Israel to enforce stricter limitations on the use of rubber bullets).

[532] Some case-law refers to violations of the right to life occurred in an armed-conflict scenario. The Court has however not left any doubt that ECHR is fully applicable in such situations: see Schabas, *The European Convention*, cit., at 153-154 (with reference to case-law at ft. 300). With respect to the right to life, the Court has so far maintained a 'chary' approach (ibid. at 154), avoiding to invoke IHL in assessing alleged violations, in contrast to the approach followed in *Hassan v. the United Kingdom*. Albeit Art. 15(2) ECHR allows for an attenuation of the respect for the right to life in armed-conflict scenarios – provided that the State formally derogated from its obligations under the same provision –, so far no such situation has come under the scrutiny of the Court, which has been pushed to decide 'against a normal legal background'; see *Khamzayev and Others v. Russia*, No. 1503/02, judgment, 3 May 2011, § 187; *Isayeva v. Russia*, § 191.

[533] For a definition of indiscriminate weapons, see *supra* Chapter II.

avoiding and, in any event, minimizing, incidental loss of civilian life'.[534] In the *Isayeva* case, the Court held that the use of 'heavy combat weapons' – namely FAB-250 and FAB-500 explosive bombs launched from Russian jets – on the village of Katyr-Yurt (Chechnya) was inconsistent with the duty to plan and execute an operation 'with the requisite care for the lives of the civilian population'.[535] In the recent *Tagayeva* case, it considered grenade launchers, tank cannons and flame-throwers, concluding that even though the decision to resort to the use of lethal force could be justified in some circumstances (e.g. during the storming of a school where terrorists are holding hundreds of hostages), the employment of indiscriminate weapons *per se* leads to a violation of the right to life.[536] *Second*, when it comes to less-lethal weapons findings might be different. For instance, in the *Finogenov* case, the resort to an incapacitating gas to terminate an hostage-taking situation in the Dubrovka theater in Moscow was not deemed in contrast with the principle of proportionality as 'while dangerous', it 'was not supposed to kill, in contrast, for example, to bombs or air missiles' and 'left the hostages a high chance of survival'.[537]

Applying the foregoing to LAWS, it must be ascertained that as *sui generis* weapons[538] they are not 'indiscriminate'. First, LAWS will presumably carry firearms but in strictly technological terms they could be equipped with distinct, interchangeable weapons – also less-lethal. What however renders them so far unique is that they feature software allowing

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[534] See ECtHR, *Tagayeva and Others v Russia*, § 573.

[535] See ECtHR, *Isayeva v. Russia*, No. 57950/00, judgment, 24 February 2004, §§ 179-201(albeit recognizing that the operation had been planned and executed in the pursuit of a legitimate aim). The use of aerial bombing in populated areas has also been condemned in *Benzer and Others v. Turkey*, No. 23502/06, judgment, 12 November 2013, § 89, 184 (claiming that the bombing as occurred was not 'acceptable in a democratic society' and inconsistent with any customary and treaty rule applicable to armed conflict).

[536] See *Tagayeva and Others v. Russia*, §§ 584-611.

[537] See *Finogenov and Others v. Russia*, § 232. Note that on that occasion the Court decided not to consider the gas as a 'lethal' or 'non-lethal' weapon, stressing by contrast that what mattered was that such gas 'was, at best, potentially dangerous for an ordinary person, and potentially fatal for a weakened person'.

[538] See *supra* Chapter II.

the machine itself to make a determination around when to resort to lethal force against individuals. In this respect, claiming that LAWS cannot live up to the States' positive duty of choosing non-disproportionate weapons because they would not be able to direct lethal force against permissible targets falls within the technological objection. If a LAWS is developed that can make this sort of determination as a human would do (i.e.: that can shoot the terrorist about to detonate a bomb with, say, no harm for bystanders), then the positive obligation will be respected.

3.3.3.2 Duty to Educate and Train Law-Enforcement Officials

UN Basic Principles focus on 'qualifications, training and counseling'[539] of law-enforcement officials tasked with using the force. In particular, the previous 'completion of special training' in the use of firearms is envisaged for those officials;[540] in the course of such training the officials must be provided with special attention to 'issues of police ethics and human rights' and 'alternatives to the use of force and firearms'.[541]

Human rights bodies have dealt with situations in which law-enforcement officials acted in a way that suggested lack of appropriate training. For instance, the ECtHR affirmed that military policemen must be trained to assess whether there is an absolute necessity to use firearms, 'not only on the basis of the letter of the relevant regulations, but also with due regard to the pre-eminence of *respect for human life as a fundamental value*'.[542]

In order to assess whether the use of LAWS can be compliant with such duty, it must be preliminarily ascertained if LAWS may be considered as law-enforcement officials for the purposes of the duty to educate and train. It is evident that UN Basic Principles – as well as other human rights provisions as interpreted by the relevant monitoring body – *assume* human

[539] As the title of Section §§ 18-21 goes.

[540] See § 19.

[541] See § 20.

[542] See *Nachova and Others v. Russia*, § 97, *italics mine*; see also *McCann v. the United Kingdom*, §§ 211-212 (complaining about the 'reflex action' of law-enforcement agents, considered as the result of poor training).

agency of the law-enforcement personnel.[543] Their premise is that those who are tasked with using lethal force against individuals are human beings. LAWS, by contrast, separate human deliberation from an actual, specific use of force. But if a LAWS decides when to resort to lethal force, this means that they fall into the category of law-enforcement officials.

'Education' and 'training' may therefore be applied to LAWS, albeit with an important *caveat*. Arguably they comprise awareness-raising and learning activities aimed at developing knowledge, skills and attitudes in the field of human rights.[544] It is clear that 'education' and 'training' posit a human process of learning – a process that cannot apply as such to LAWS. It is however true that LAWS will operate within the boundaries of the software they are endowed with. It follows that if they can be programmed in a way that they can apply a graduated use of force, at the same conditions that human agents would do that, the duty of precaution will be considered respected substantially.[545] As much as technically challenging, such a scenario is not implausible,[546] as the approach of this work goes. A crucial point that remains unexplored, however, is to what extent such 'education' and 'training' may comply with the ECtHR's standard of 'respect for human life as a fundamental value'.[547] Understanding the *value* of human life is a complex operation that cannot be translated into algorithms.[548] This leads

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[543] See Chengeta, *Can Robocop Serve and Protect*, cit., at 19-20.

[544] See for instance the *UN Declaration on Human Rights Education and Training*, adopted by the UNGA on 19 December 2011, UN Doc. A/RES/66/137.

[545] Chengeta, *Can Robocop Serve and Protect*, cit., 20 (arguing however that a LAWS could 'never do it better than a human being because it cannot fully appreciate the situation, understand the intentions of the suspect and above all may not possess negotiating capacity to persuade like a human being would do').

[546] See Heyns, *Human Rights and the use of Autonomous Weapons Systems*, cit., 362-366.

[547] See *supra*.

[548] See supra Chapter II. For a thought-provoking example, see Surden, *Machine Learning and the Law*, 89 Washington Law Review No. 1 (2014), 87-115, particularly at 90-93 (considering algorithms for classifying incoming emails as either 'spam' or 'wanted' emails that are based on their ability to continually refine their internal model rather than in their actual understanding of the emails' content). The suggestion is therefore the following: these classifying algorithms do not really grasp the reality they organize, they just get… good at doing their jobs thanks to their capability of inferring new and useful patterns from big quantities of data. They are *intrinsically* 'dumb' but *apparently* 'intelligent'.

us to a decisive consideration. Even though the specific use of force may be in line with IHRL rules that regulate the resort to lethal force, its 'applier' cannot understand the value of its action as it has no human agency.

This may appear as a radical incompatibility with the positive duty of 'educating' and 'training'; on closer inspection, however, such objection can be rebutted by supporters of LAWS. The rationale of the positive duty is to develop a better respect for basic human rights in law-enforcement operations, where are too often ignored.[549] *If* a machine is developed that cannot go beyond a certain degree of force pending certain conditions (i.e. the same in which human agents would resort to lethal force) due to (*recte*: thanks to) algorithmic constraints, *then* the duty of 'educating' and 'training' would be respected by definition, and understanding the value of human life, yet welcomed in abstract, would turn into a redundant prerequisite. To put it differently: in order for a machine to perform in an acceptable manner it is not essential for it to possess the same *cognitive* capabilities humans have.

To sum, the positive duty of 'educating' and 'training' may be interpreted as imposing on State an obligation to develop LAWS to be employed in law-enforcement operations that can perform – at least – as human agents, meaning with analogous responses to analogous circumstances.[550]

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[549] This is one of the main grounds basing on which the HRC has concluded that, for instance, US' and Israel's conduct do not respect the right to life. See Concluding observations on the fourth periodic report of Israel, CCPR/C/ISR/CO/4, 21 November 2014, §13(a) (calling upon Israel to take ''all necessary measures to prevent incidents of excessive use of force during law enforcement operations, including by ensuring that rules of engagement or open fire regulations of [Israel's] security forces in the West Bank, including East Jerusalem, and the Access Restricted Areas of Gaza, are consistent with article 6 of the Covenant and the Basic Principles on the Use of Force and Firearms by Law Enforcement Officials'); Concluding observations on the fourth periodic report of the United States, 2014, §11(a) and (b) (expressing concern about the 'still high number of fatal shootings by certain police forces, including, for instance, in Chicago, and reports of excessive use of force by certain law enforcement officers' and calling upon the US to '[s]tep up its efforts to prevent the excessive use of force by law enforcement officers').

[550] This is the argument made by Arkin, *The Case for Ethical Autonomy*, cit., *passim*.

3.3.3.3. Duty to investigate and prosecute

Better known as 'procedural obligation',[551] this positive duty stems from the need to hold accountable those who are responsible for unlawful deprivations of life.[552] It involves the obligation to invest and prosecute when necessary; in this sense, it is 'not an obligation of result but of means only'.[553] The aims are: (*i*) ensuring that those responsible are brought to justice; (*ii*) promoting accountability and preventing impunity; (*iii*) avoiding denial of justice; (*iv*) eventually drawing necessary lessons for revising practices and policies with a view to avoiding repeated violations.[554]

Human rights bodies have so far developed a considerable case-law on the duty to investigate and prosecute.[555] On a whole, investigations are required to be thorough, independent, accessible to the victim's family, prompt, capable of leading to a determination as to whether the use of force was permissible, and finally allowing appropriate public scrutiny.[556] In

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[551] See ECtHR [GC], *Šilih v. Slovenia*, No. 71463/01, judgment, 9 April 2009, § 153; *Ergi v. Turkey*, 28 July 1998, § 82; *McCann v. the United Kingdom*, §§ 157-164.

[552] See Schabas, *The European Convention*, cit., at 134. See also GC No. 36, cit., § 31: '[a]n important element of the protection afforded to the right to life by the Covenant is the obligation to investigate and prosecute allegations of deprivation of life by State authorities or by private individuals and entities, including allegations of excessive use of lethal force' (references omitted).

[553] See ECtHR [GC], *Šilih v. Slovenia*, § 193. See also IACtHR, *Cantoral Huamaní and Garcia Santa Cruz v. Peru*, Preliminary objection, merits, reparations and costs, 10 July 2007, Series C 167 (2007), § 131, and *Pueblo Bello Massacre v Colombia*, 31 January 2006, Series C 140 (2006), § 143.

[554] See *GC36*, cit., § 31 (references omitted). See also ECtHR, *Jasinskis v. Latvia*, judgment, 21 December 2010, § 72 (arguing that the 'essential' purpose of the duty to investigate is 'to secure the effective implementation of the domestic laws which protect the right to life and, in those cases involving State agents or bodies, to ensure their accountability for deaths occurring under their responsibility').

[555] See *ex multis* IACtHR, *Velásquez Rodríguez v Honduras*, Merits, Judgment of 29 July 1988, Series C No 4 (1988), § 166; ACtHPR, No. 245/02, *Zimbabwe NGO Human Rights Forum v Zimbabwe* (2006), § 153.

[556] As scholarship notes, the European case-law has advances more than other regional and universal bodies. See Leach-Murray-Sandoval, *The Duty to Investigate Right to Life Violations across Three Regional Systems: Harmonisation or Fragmentation of International Human Rights Law?*, in Buckley-Donald-Leach, *Towards Convergence in International Human Rights Law*

short, they must be effective, in the sense of being capable of establishing facts and identifying those responsible.[557] A criminal action is not required *per se*,[558] except in cases of intentional deprivation of life, where civil action for redress is believed inadequate absent other remedies.[559]

LAWS's impact on procedural obligations is twofold. On the one hand, their use is likely to *advance* standards of investigations. Allegedly they can be equipped with a 'black box' performing not only a recording function to capture data for subsequent analysis, but also a tracking function that enables human operator to audit the performance and understand why LAWS did what they did.[560] This means that in the event of a LAWS applying lethal force against an individual, a human operator would be able to determine whether that force was permissible or not and, in the latter, what went wrong (e.g. a malfunctioning of the system). This is a matter that touches upon the issue of *legibility* of LAWS – a concept that will be illustrated below. If human operators could not ascertain *ex post facto* the reasons why a LAWS has performed in a certain way in certain circumstance, this would impinge on the procedural obligation stemming from the right to life. In order for the use of LAWS to be compliant with it, it is thus required that their performance be legible.

Approaches of Regional and International Systems, Leiden, 2016, 31-67, at 32. See Schabas, *The European Convention*, cit., at 135, with relevant case-law at fts. 153-157.

[557] See *Finogenov and Others v. Russia*, cit., § 269. The ECtHR has at times adopted different-in-name but equal-in-substance standards: compare *Öneryıldız v Turkey*, No 48939/99, Judgment, 30 November 2004, § 94 ('exemplary diligence'); *Opuz v Turkey*, No 33401/02, Judgment, 9 June 2009, §§ 131 and 137-149 ('due diligence'). The standard of due diligence is the one adopted by the IACtHR; see Leach-Murray-Sandoval, *The Duty to Investigate*, cit., at 33.

[558] See ECtHR [GC], *Šilih v. Slovenia*, cit., § 194.

[559] See Schabas, *The European Convention*, cit., at 137, with relevant case-law at fts. 175-176. See also HRCt, *Suarez de Guerrero v. Colombia*, cit., § 13.3 (for a case concerning an arbitrary killing performed by State agents); *Bautista de Arellana v. Colombia*, Communication No. 563/1993, U.N. Doc. CCPR/C/55/D/563/1993 (1995), § 8.2 (arguing that 'purely disciplinary and administrative remedies cannot be deemed to constitute adequate and effective remedies … in the event of particularly serious violations of human rights, notably in the event of an alleged violation of the right to life').

[560] This is a function LAWS can be endowed with. See for instance *Summer Study on Autonomy*, Report published by the DoD Defense Science Board, June 2016, at 13, 34.

On the other hand, they may *compromise* the duty to hold those who are responsible for an unlawful use of force accountable. This is a matter that touches upon the issue of responsibility for wrongdoings committed through LAWS, and will be dealt with more thoroughly in the next Chapter. For now, suffice it to say that LAWS may perform in a way that is neither understandable nor explicable by their operators.[561] If States do not put in place mechanisms allowing for a 'clear distribution of lines of responsibilities',[562] such lack may be conducive to a violation of the right to life under its procedural tenet.

In conclusion, human presence at the very act of using force may not be a requisite of the procedural obligation, provided that: (*i*) it is possible to trace *ex post facto* why and how LAWS have performed; (*ii*) it is possible to assign responsibility should an impermissible use of force have occurred.

3.3.4 'Non-Arbitrariness' as a Way Forward

To recapitulate what has emerged so far from the case-law of human rights bodies, it seems that human presence at the moment of deliberating whether to employ lethal force against an individual is *not* required *as such* by IHRL. It seems appropriate however to take an extra step in our analysis of the right to life and assess if within that right there is any 'hidden' ground for prohibiting LAWS.

Interestingly some assert that 'non-human decision-making regarding the use of lethal force is … *inherently arbitrary*, and all resulting deaths are arbitrary deprivations of life'.[563] The requisite of non-

[561] As shown in Chapter I, predictability must be one key feature of LAWS in order for them to be operationalized in contexts of policing as well as armed conflict. However it has been argued that algorithms may perform in unforeseeable ways in real-life situations due to environmental complexity; should machine learning or deep learning techniques be employed, then the chance for unpredictable behavior will tend to increase.

[562] ECtHR, *Tagayeva and Others v. Russia*, cit., § 570.

[563] See Heyns Report, cit., § 90; Asaro, *On banning autonomous weapon systems*, cit., at 700 ('[t]he decision to kill a human can only be legitimate if it is non-arbitrary, and there is no way to guarantee that the use of force is not arbitrary without human control, supervision, and responsibility').

arbitrariness for deprivations of life is explicit in ICCPR and in the ACHR; it is only implicit in the ECHR.[564] In order to ascertain whether autonomous decision-making is in itself at variance with the principle of non-arbitrariness we must consider what 'arbitrariness' actually means for the purposes of the protection of the right to life. It is appropriate to discuss the notion in isolation from both negative and positive obligations for a twofold reason: *first*, as it has been shown above, the two set of obligations naturally tend to converge and overlap in practice; *second*, this might provide an ultimate, independent ground for rejecting LAWS on the account of the right to life.

To begin with, the principle of non-arbitrariness is generally associated with the requirement of legality.[565] Even when there is a legal basis for using lethal force against an individual, such use must not be 'arbitrary'. Allegedly it covers not only deprivations that occur 'against the law' but also 'unjustly, inappropriately or … unpredictabl[y]'.[566]

The meaning of the word 'arbitrary' or 'arbitrarily' was contested during the *travaux préparatoires* of Art. 6 ICCPR.[567] It was in fact a dispute that had begun years before, at the time of the drafting of UDHR, [568] where two opposing interpretations were pushed, one that considered 'arbitrary' as synonym with 'not in conformity with or provided for by law', another as synonym with 'unjust' notwithstanding conformity with domestic law.[569] ICCPR's provision on the right to life – discussed at the Fifth, Sixth and

[564] See Pedrazzi, *The Protection of the Right to Life in Law-Enforcement Operations*, in Cortese (ed.), *Studi in onore di Laura Picchio Forlati*, Turin, 2014, 105-114, at 107.

[565] See Heyns, *Autonomous weapons in armed conflict and the right to a dignified life: an African perspective*, 33 South African Journal On Human Rights No. 1 (2017), 46-71, at 52 (affirming that 'an "arbitrary" deprivation of life can be seen as taking of life in a way that is in violation of international law').

[566] See Chengeta, *Can Robocop 'serve and protect'*, cit., at 9-10.

[567] See Boyle, *The Concept of Arbitrary Deprivation*, cit., 224-226 and *passim*.

[568] Where it appeared in four clauses, save for in Art. 3 protecting the right to life. See Boyle, *The Concept of Arbitrary Deprivation*, cit., 224.

[569] See id. at 225. See *amplius* Hassan, *The word 'arbitrary' as used in the Universal Declaration of Human Rights: 'illegal' or 'unjust'?*, 10 Harvard International Law Journal (1969), 225-262.

Eighth sessions of the Commission on Human Rights –[570] finally included the reference to the notion of arbitrariness to solve disagreements among Delegates about how to best draft the provision, especially as far as capital punishment was involved.[571]

Subsequent case-law shows that the notion of 'arbitrariness' has been employed to complement that of 'legality'. A deprivation of life has been declared arbitrary not only when in contrast to existing law, but also when inconsistent with the relevant human rights provision.[572] Apparently 'arbitrariness' was intended as a comprehensive notion aimed at including (without specifying) several grounds of exception to the prohibition of deprivation of life – the ones that for example have been listed in the provision of Art. 2(2) ECHR.[573] It has been noted for example that the IACtHR's case-law refers to a notion of 'arbitrariness' going beyond the use of force that 'does not conform to the formal law, but also that which is unjust', where 'unjust' is framed in the principles of necessity and proportionality as explained above.[574]

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[570] See E/CN.4, SR.90, 91, 93, 94, 97, 98, 101, 135, 139, 140, 144, 149, 150, 152, 153, 199, 309, 310, 311.

[571] See Boyle, *The Concept of Arbitrary Deprivation*, cit., at 227-233. The author explains how some Delegates were more favorable to a 'general limitations language' avoiding to fix grounds of exceptions (for instance, the US and USSR), while others pushed for a 'detailed listing' approach. Eventually the 'controversial' sentence referring to the notion of arbitrariness was adopted 'very much as a last resort'. See also Nsereko, *Arbitrary Deprivation of Life: Controls on Permissible Deprivations*, in Ramcharan, cit., 245-283, at 247-248 (underscoring that the language eventually adopted for Art. 6(1) ICCPR has 'the advantage of being general and capable of covering the different legal systems of the world').

[572] See HRC, Case No. R.11/45, *Camargo Guerrero v. Colombia*, view adopted on 1982, A/37/40, 93-94. For a comment, see Boyle, *The Concept of Arbitrary Deprivation*, cit., at 236 (concluding that 'it was insufficient for conformity with the Covenant to establish that the deprivation was justified in the State's law', thus showing how the notion of 'arbitrariness' is larger in scope than that of 'legality'). See also more recently ACmHPR, *General Comment No. 3 on the African Charter on Human and Peoples' Rights: The Right to Life (Article 4)*, § 12 ('[a] deprivation of life is arbitrary if it is impermissible under international law, or under more protective domestic law provisions').

[573] See Pedrazzi, *The Protection of the Right to Life*, cit., at 109 and *passim*.

[574] Id. at 109. The authors refers to IACtHR, *Barrios Family v. Venezuela*, judgment, 24 November 2011, § 49 (stating the use of force by State agents must be exceptional and 'limited by the principles of proportionality, necessity and humanity').

GC36 deserves mention in that it offers a thorough recognition of what 'arbitrariness' has come to mean to date. Allegedly it encompasses: (*i*) inappropriateness; (*ii*) injustice; (*iii*) lack of predictability; (*iv*) due process of law; (*v*) necessity; (*vi*) proportionality; (*vii*) reasonableness.[575] Recently, it has been declined in terms of 'discrimination' and even through the lens of 'gender-sensitive approach'.[576] This is in line with scholarship,[577] which has interpreted the notion of 'arbitrariness' as covering practice such as death penalty inflicted on a discriminatory basis,[578] summary and extrajudicial executions,[579] enforced or involuntary disappearances,[580] law enforcement abuses of power,[581] and military excesses,[582] often with respect not only to the right to life but also to the right to liberty. In short, as General Comment No. 3 to the ACHPR puts it, the notion of 'arbitrariness' applies to '[a]ny

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[575] See GC36, cit., § 18, with relevant case-law at fts. 37-43.

[576] See *Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions on a gender-sensitive approach to arbitrary killings*, A/HRC/35/23, 6 June 2017.

[577] See for instance Nsereko, *Arbitrary Deprivation of Life*, cit., 257 and *passim*.

[578] See *General Comment No. 6*, §§ 6-7; GC36, § 16 ('countries which have not abolished the death penalty and that have not ratified the Second Optional Protocol can only apply the death penalty in a *non-arbitrary manner*, with regard to the most serious crimes and subject to a number of strict conditions…', italics mine).

[579] Also when committed by private individuals and public authorities have not adequately prevented, investigated or prosecuted the responsible (thus violating their positive obligations). See for instance the *Cotton Field* case, IACtHR, *González et al. v. Mexico*, judgment, 16 November 2009. See more generally IACtHR, *Nadege Dorzema et al v Dominican Republic*, Judgment (Merits, Reparations, and Costs), 24 October 2012, §97; ACmHPR, *General Comment No. 3*, cit., §§ 38-39.

[580] For a definition, see UN Doc. E/CN.4/1983/16, § 66; UN Doc. E/CN.4/1992/CRP.1, 12 February 1992, § 606 (b). See ECtHR [GC], *Varnava and Others v. Turkey*, judgment, 18 September 2009, § 148.

[581] See HRC, Communication No. 305/1988, *Van Alphen v. The Netherlands*, Views adopted on 23 July 1990, §. 5.8; Communication No. 1134/2002, *Gorji-Dinka v. Cameroon*, Views adopted on 17 March 2005, § 5.1. For ECtHR's early case-law, see *mutatis mutandis X v. the United Kingdom*, judgment, 5 November 1981, §§ 42-43 (for a case concerning an 'arbitrary' deprivation of liberty under Art. 5 ECHR).

[582] See *Hugo Bustíos Saavedra* (Peru), judgment [Comm.], 16 October 1997, §§ 58-61. See *mutatis mutandis* ECtHR [GC], *Hassan v. the United Kingdom*, No. 29750/09, judgment, 16 September 2014, § 110 (affirming, in a case concerning the right to liberty under Art. 5 ECHR, that the applicant's 'capture and detention was *consistent with the powers* available to the United Kingdom under the Third and Fourth Geneva Conventions, and was *not arbitrary*', italics mine)

deprivation of life resulting from a violation of the procedural or substantive safeguards' of the relevant human rights treaty:[583] *nihil pluris*.

In the light of the foregoing, the contention according to which autonomous killing (i.e. in which human agents play no actual deliberative role) would be *per se* 'arbitrary' and therefore proscribed by the right to life is at most *de jure condendo*. Rather, what can be inferred from existing law is that, for instance, an *unreasonable* deprivation of life is prohibited insofar as arbitrary. When the 'applier' of lethal force is a machine – i.e. a non-human agent – it is arguable that *as long as it is possible to verify and explain how and why* the LAWS acted as it did, the deprivation of life could not be deemed arbitrary. Counting upon the nexus between 'non-arbitrariness' and 'reasonableness', the issue of LAWS's impact on the right to life may be rephrased as follows: *if* no scrutiny is possible on how and why a LAWS conducted in a certain way (e.g. shooting a suspect allegedly about to detonate a bomb in a public place *à la Armani da Silva*), *then* a human agent (e.g. the operator, the public prosecutor, the judge, the citizen) will be given no explanation by the system. This might be the case, for example, when self-learning algorithms are involved, as the decision-making process may be unintelligible also to data controllers.[584] Such situation would surely have an impact, for instance, on the positive obligation to conduct investigations into an (allegedly) unlawful deprivation of life as well. It is therefore possible to interpret the requirement of 'non-arbitrariness' in the sense that each decision to use lethal force against an individual (*rectius*: the algorithmic process leading to such outcome) must be *explainable* and *understandable*.

3.3.5 Right to 'Legibility' and Right Not to Be Subject To Solely 'Automated' Decision-Making as Another Way Forward

[583] See *General Comment No. 3*, cit., § 12.
[584] See *amplius supra* Chapter I.

The need for an understandable and explainable algorithmic decision-making process has recently inspired some legal scholarship in the field of data protection. It has been argued that individuals who have been made the object of automated decision-making must enjoy a 'right to legibility' of the processes they have been involved in. In this paragraph it is therefore inquired: (*i*) what it is the scope of such right in the field of data protection; (*ii*) to what extent this right may be of any use in understanding ATC and its impact on the right to life.

To begin with data protection, the individual's right to *understand* the functioning and the impact of algorithms concerning him/her has been recognized in several provisions regarding data protection adopted in the frameworks of the Council of Europe[585] and the European Union[586], in both cases in binding terms. In particular, the right to know the reasons that underlie an 'automated' decision derives from a set of several rights such as the right to receive *ex ante* information from data controllers and the right to access to information *ex post*, that is after the decision-making process has been undertaken or concluded.[587] Another key provision concerning data

[585] See Modernized Convention No. 108, art. 9; *Explanatory Report to the Protocol amending the Convention for the Protection of Individuals with regard to Automatic Processing of Personal Data*, CM(2018)2-addfinal (CETS No. 223) (hereinafter: Explanatory Report), §§ 71-83.

[586] See for instance the GDPR. For the sake of clarity, as established by its art. 2(2) the GDPR does not apply to the field of 'common foreign and security policy' (b) nor to processing of personal data 'by competent authorities for the purposes of the prevention, investigation, detection or prosecution of criminal offences or the execution of criminal penalties, including the safeguarding against and the prevention of threats to public security' (d), which *de facto* limits the scope of our analogy. On the contrary, Modernized Convention No. 108 applies to all activities carried out by public authorities in full, as provided for by art. 3(1) ('[e]ach Party undertakes to apply this Convention to data processing subject to its jurisdiction in the public and private sectors, thereby securing every individual's right to protection of his or her personal data') in conjunction with art. 1 ('[t]he purpose of this Convention is to protect every individual, whatever his or her nationality or residence, with regard to the processing of their personal data, thereby contributing to respect for his or her human rights and fundamental freedoms, and *in particular the right to privacy*', italics added). What is more, the twofold circumstance that (*i*) such provision is entitled 'object and purpose' and (*ii*) the presence of an open-textured expression such as the one that has been emphasized above ('in particular') allows for a broad interpretation of the provisions contained in Modernized Convention No. 108, which would cover the right to life as well.

[587] See for instance GDPR art. 15(1): '[t]he data subject shall have the right to obtain from the controller confirmation as to whether or not personal data concerning him or her are

protection is the right not to be subject to a decision *significantly* affecting an individual based *solely* on an automated processing of his/her data.[588] In the GDPR field – but the same seems to hold true for other international instruments – some scholars have proposed a *systemic* interpretation of these two rights in the sense that they establish a 'right to legibility': in short, it is argued that transparency and comprehensibility require that the right not to be subject to 'automated' decision-making proscribe also nominal human intervention and that the right of access include a broader right to know the rationales behind specific decisions concerning the data subject.[589] The main rationale of the envisaged 'right to legibility'[590] is to ensure a more effective protection of the rights of individuals affected by 'automated' decision-making in fields where their vulnerability could be exploited more (for instance, marketing manipulations or unfair commercial practices).[591]

Thinking of ATC in terms of legibility turns to be particularly effective through the lens of the right to life as well, for the following reasons. *First*, an ex-ante knowledge of how algorithms involved in the ATC process appears to satisfy the legal requirement of 'legality' and 'non-arbitrariness' of the use of force as enshrined in IHRL. It has been argued that the protection of the right to life necessitates 'an appropriate legal and

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being processed, and, where that is the case, *access* to the personal data and the following information: … h) the existence of automated decision-making, including profiling, referred to in Article 22(1) and (4) and, at least in those cases, *meaningful information about the logic involved*, as well as the *significance* and the *envisaged consequences* of such processing for the data subject' (italics added); *Modernized Convention 108*, art. 9(1): 'Every individual shall have a right: … (c) to obtain, on request, *knowledge of the reasoning* underlying data processing where the results of such processing are applied to him or her' (italics added).

[588] See art. 9(1)(a) Modernized Convention No. 108; art. 22(1) GDPR.

[589] See Malgieri-Comandè, *Why a Right to Legibility of Automated Decision-Making Exists in the General Data Protection Regulation*, 7 International Data Privacy Law No. 4 (2017), 243-265.

[590] It must be recalled that the 'right to legibility' is not widely recognized as a workable framework for understanding GDPR's provisions. For a critical approach, see Wachter et al, *Why a Right to Explanation of Automated Decision-Making Does Not Exist in the General Data Protection Regulation*, 7 International Data Privacy Law No. 2 (2017), 76-99, at 92 (contending for instance that 'the phrase "solely" suggests even some nominal human involvement may be sufficient').

[591] See Malgieri-Comandè, *Why a Right to Legibility*, cit., at 253.

administrative framework *defining the limited circumstances* in which law enforcement officials may use force and firearms, in the light of the relevant international standards'.[592] If such regulatory framework is obscure, or fails to provide individuals with understandable – 'legible' – indications about the conditions in which LAWS resort to lethal force in law-enforcement situations (the abovementioned 'limited circumstances'), the requirement of legality will be hardly met. *Second*, ex-post explanation about the process that has actually led to a specific automated decision comes to the fore from the perspective of the duty to conduct investigations into (allegedly) unlawful deprivations of life. As explained above, such investigations have to be *capable* of leading to a determination of whether the force used was justified *in the circumstances*.[593] In the dynamic of ATC processing, it is therefore of paramount importance that public authorities provide an intelligible account of how an automated process has worked; a failure to 'explain how',[594] *reddere rationem*, may lead to responsibility under IHRL.[595]

A stronger argument may be developed as follows: *if* the individual enjoys a right not to be subject to a solely automated decision, *then* LAWS would be prohibited as such, as ATC in split-second scenarios does not allow for human intervention. On closer inspection, however, not even this circumstance seems decisive for considering LAWS as already prohibited by IHRL. The right in itself is subject to exceptions, namely when the decision is authorized by law and adequate safeguards of the individual's

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[592] See ECtHR, *Giuliani and Gaggio v. Italy*, No. 23458/02, judgment, 24 March 2011, § 209.

[593] ECtHR, *Isayeva v. Russia*, No. 57950/00, judgment, 24 February 2005, §§ 221-223 (for a case where the ineffectiveness of the investigation was predicated in that it had made 'few attempts to find an explanation for … serious and credible allegations', thus placing the need for an *explanation* about the use of force at the center of the right to life under its procedural tenet).

[594] See ECtHR, *Khodorkovskiy and Lebedev v. Russia*, No. 11082/06 and 13772/05, judgment, 25 July 2013, § 848 (discussing the algorithmic method used for distributing convicted individuals among prisons).

[595] The issue has also been tackled from the standpoint of international humanitarian law. See Marguiles, *Making Autonomous Weapons Accountable: Command Responsibility for Computer-Guided Lethal Force in Armed Conflicts*, in Ohlin (ed), *Research Handbook on Remote Warfare*, Edward Elgar Press, forthcoming, at 23 (underscoring that the onus is on the State to provide adequate details about decision-making processes at large).

rights are laid down.[596] Assuming that the employment of LAWS will be regulated by law (*a fortiori* as already proscribed by the abovementioned rule of legality) and will ensure that the specific conditions of the (potential) target are taken into due consideration, the exception can attach.

To sum, the right to 'legibility' as pushed forward by scholarship is a useful tool for 'testing' the compatibility of LAWS with the right to life. Failure to provide information and explanation about how and why algorithms work and lead to a certain decision, both *ex ante* and *ex post*, will expose public authorities employing LAWS to responsibility under IHRL. The same responsibility attaches when law does not regulate the circumstances in which ATC is allowed and does not provide adequate guarantees for the respect of basic human rights, as this would contrast with the right not to be subject to a solely 'automated' decision-making. However, it does not seem that a right not to be subject to solely 'automated' decisions exists in IHRL in the sense that individuals may *never* be the target of LAWS. In order to reach such conclusion, it is necessary to move to a different understanding of the rights at stake – which is not provided for by existing IHRL. Here is where human dignity kicks in.

3.4 Human Dignity

3.4.1 Preliminary Remarks

Human dignity has been described as 'the basic underpinning and […] the very *raison d'être* of international humanitarian law and human rights law',[597] 'one of the most pervasive and fundamental ideas in the entire

[596] See *Modernized Convention 108*, Art. 9 par. 2. What is more, as far as the GDPR is concerned law-enforcement operation fall outside the scope of the rule. The divergence between the former contexts (e.g. credit scoring) and those where LAWS will be operated in our scenario (e.g. law-enforcement operations) warn against drawing rash and far-fetched analogies; an *a fortiori* reasoning here, albeit appealing, may risk obliterating that divergence and more importantly misunderstanding existing law.

[597] ICTY, *Furundžija case*, Trial Chamber Judgment, 10 December 1998, § 183.

corpus' of IHRL.[598] Scholarship on human dignity, as well as domestic and international case-law, have literally blossomed in the last century, which today results in the difficulty – if not the impossibility! – to enucleate an universally-accepted notion of 'human dignity'. 'Human dignity' appears as a polymorphous concept, tasked with different and quite discrete functions depending on the *contexts* where it is employed and the *purposes* of its employment: a *reductio ad unum* seems impracticable. To cite an example of such polymorphism, human dignity may be understood as source of State duties towards individuals, but also as source of duties that individuals have towards themselves (i.e. *objective* dignity).[599] This is why

[598] See Carozza, *Human Dignity*, in Shelton (ed.), *The Oxford Handbook of International Human Rights Law*, Oxford, 2013, 345-359, at 354. 'Human Dignity' is a well-affirmed principle also from the standpoint of domestic (constitutional) law; it would however go too beyond the scope of the present work to analyze the concept of dignity and the uses thereof in those contexts. For a general appraisal of human dignity as a social and constitutional value, see recently Barak, *Human Dignity. The Constitutional Value and the Constitutional Right*, Cambridge, 2015, and Duprè, *The Age of Dignity. Human Rights and Constitutionalism in Europe*, Oxford, 2015. For other references to human dignity, see O'Connell-Day, *Sources and the Legality and Validity of International Law*, cit., at 575 (showing that the notion of human dignity is imbued with natural-law thinking, and explaining the 'renaissance' of such notion in the second half of the twentieth century).

[599] On this point, see *amplius* De Sena, *Dignità umana in senso oggettivo e diritto internazionale*, 11 Diritti Umani e Diritto Internazionale No. 3 (2017), 573-586; Hennette-Vauchez, *A human* dignitas*? Remnants of the ancient legal concept in contemporary dignity jurisprudence*, 9 International Journal of Constitutional Law No. 1 (2011), 32-57.

several commentators consider this concept as a vacuous,[600] suspicious,[601] even dangerous,[602] one, lacking any stable meaning and content.[603]

While it is not possible to provide a thorough account of what 'human dignity' is and how it has been employed in the legal discourse on human rights so far, it seems important at least to focus on the *legal* status of human dignity in IHRL, as it is gaining traction in the debate around LAWS. The Paragraph is structured as follows: *first*, an overview of the positions that consider 'human dignity' as a relevant notion for assessing the implications that LAWS may have on IHRL will be provided (3.4.2); *second*, the normative value of 'human dignity' in IHRL will be analyzed with a view to testing the soundness of resorting to such concept to oppose LAWS (3.4.3).

3.4.2 'Human Dignity' in IHRL

The first reference to human dignity in IHRL is made in the UDHR. The term appears in the Preamble ('*inherent* dignity … of all members of the human family') and in Art. 1, which proclaims that '*all* human beings are born free and equal in dignity *and* rights'. It follows that dignity is (*i*) a value that pertains to human beings *as such*, and (*ii*) an *universal* one as it attaches to being a member of a community. No further explanation is provided; as

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[600] See Bagaric-Allan, *The Vacuous Concept of Dignity*, 5 Journal of Human Rights No. 2 (2006), 257-270 (contending that the discourse on dignity is so rich in open-ended observations that it is impossible to grasp anything about that concept 'in any sense beyond the tautological', at 268).

[601] See Martens, *Encore la dignité humaine : réflexions d'un juge sur la promotion par les juges d'une norme suspecte*, in Verdussen et al. (eds.), *Les droits de l'homme au seuil du troisième millénaire : mélanges en hommage à Pierre Lambert*, Bruxelles, 2000, 561-579, (particularly at 562: [l]a dignité humaine est en passe de devenir la notion la plus agaçante de la littérature judiciaire, tant elle se prête à des utilisations variées').

[602] See the Joint Dissenting Opinion of Judges Spielman and Jebens in ECtHR, *Vereinigung Bildender Künstler v. Austria*, No. 68354/01, judgment, 25 January 2007, § 9 ('[p]our nous, il ne s'agit pas du concept abstrait ou indéfini de dignité humaine, notion qui peut être *en soi dangereuse* lorsqu'elle est de nature à justifier hâtivement des limitations inacceptables aux droits fondamentaux', italics added).

[603] See for instance Bates, *Human Dignity – An Empty Phrase in Search of Meaning*, 10 Judicial Review No. 2 (2005), 165-169 (claiming that until a definition is provided the concept of 'human dignity' will be of little use in adjudication).

a matter of fact, it has been argued that such a 'cosmopolitan' principle was meant to address governments, and therefore did not need 'a deep philosophical justification'.[604] Human dignity then appears in the text of Arts. 22 and 23(3) UDHR.[605] Further references to human dignity have been made in other universal instruments – such as the ICCPR,[606] the ICESCR,[607] the CERD,[608] the CEDAW,[609] the CAT,[610] the CRC,[611] the CRPD[612] – as well as in regional instruments,[613] *each time in a different context and in an unspecified meaning*.

It follows that attributing a precise meaning – or at least one that goes beyond a minimum understanding of the concept – to 'human dignity' is nearly impossible. On closer inspection, however, such *de minimis* result is the one that States back then aimed to achieve: adapting to the most

[604] As explained by Brownsword, *Human dignity from a legal perspective*, in Düwell et al. (eds.), *The Cambridge Handbook of Human Dignity*, Cambridge, 2014, 1-22, at 2-3.

[605] Art. 22: 'Everyone, as a member of society, has the right to social security and is entitled to realization, through national effort and international co-operation and in accordance with the organization and resources of each State, of the economic, social and cultural rights indispensable for his dignity and the free development of his personality'; Art. 23(2): 'Everyone who works has the right to just and favourable remuneration ensuring for himself and his family an existence worthy of human dignity, and supplemented, if necessary, by other means of social protection'.

[606] Art. 10(1): 'All persons deprived of their liberty shall be treated with humanity and with respect for the inherent dignity of the human person'.

[607] Art. 13(1) *in principio*: 'The States Parties to the present Covenant recognize the right of everyone to education. They agree that education shall be directed to the full development of the human personality and the sense of its dignity, and shall strengthen the respect for human rights and fundamental freedoms'.

[608] See Preamble.

[609] See Preamble.

[610] See Preamble (which affirms that the rights recognized therein 'derive from the inherent dignity of the human person').

[611] See Preamble and Arts. 23, 28, 37, 39, 40.

[612] See Preamble and Arts. 1, 3(a), 8(1)(a), 16(4), 24(1)(a), 25(d). For references to dignity in this Convention, see also Carozza, *Human Dignity*, cit., at 351 (suggesting that due to the numerous reference to 'dignity' it is plausible that the concept is used more as a separate matter from human rights than a way of grounding them as a whole).

[613] While no reference to human dignity is made in the ECHR, the ACHR employs the word 'dignity' three times (Arts. 5(2), 6(2) and 11(1)) and the ACHPR as well (twice in the Preamble and in Art. 5).

heterogeneous contexts without losing in functionality.[614] In other words, the key feature of an open-textured concept such as that of 'human dignity' lies in the functions it may perform (i.e. its *dynamic* dimension) rather than in its content (i.e. *static* dimension).

In addition to providing a shared foundation of human rights, the concept of 'human dignity' has been used for two purposes at least. The *first* is *ad adiuvandum*, i.e. to provide either further justification for protecting a certain human right or stricter grounds of limitation thereof. Examples for the former category may be traced in international case-law on physical integrity[615] or equality and non-discrimination[616], while for the latter

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[614] See Carozza, *Human Dignity*, cit., at 349 ('[t]he capaciousness of the word 'dignity' allows it to represent an affirmation belonging to a wide array of different traditions, while the generality of the term, standing alone without further elaboration, does not decisively signify any of those traditions'). Of the same opinion is McCrudden, *Human Dignity and Judicial Interpretation of Human Rights*, 19 EJIL No. 4 (2008), 655-724.

[615] See *ex multis* ECtHR, *Tyrer v. the United Kingdom*, No. 5856/72, judgment, 25 April 1978 (for a case relating to corporal punishment of a child in school as in violation of the right not to be subject to torture or inhuman or degrading treatment: '[a]lthough the applicant did not suffer any severe or long-lasting physical effects, his punishment – whereby he was *treated as an object* in the power of authorities – constituted an *assault* on precisely that which is one of the main purposes of Article 3 to protect, namely a person's dignity and *physical integrity*', § 33, italics added); *Kuznetov v. Ukraine*, No. 39042/97, judgment, 29 April 2003 (for a case relating to conditions of detention that were believed to 'have caused him considerable mental suffering, diminishing his human dignity'); *Bouyid v. Belgium* [GC], judgment, 28 September 2015 (for a case relating to a use of force towards an individual: 'in respect of a person who is deprived of his liberty, or, more generally, is confronted with law enforcement officers, any recourse to physical force which has not been made strictly necessary by his own conduct diminishes human dignity and is, in principle, an infringement of the right set forth in Article 3', § 88). See IACtHR, *Juvenile Reeducation Institute v. Paraguay*, judgment, 2 September 2004 (for a case concerning conditions of detention: 'all persons detained have the right to live in prison conditions that are in keeping with their dignity as human beings', § 151); *Velásquez Rodríguez case*, cit. (for a case concerning prolonged denial of communication in prison, § 156); *Loayza Tamayo v. Peru*, judgment, 17 September 1997 (for a case regarding excessive force in controlling inmate behavior, § 57); *Miguel Castro-Castro Prison v. Peru*, judgment, 25 November 2006 (for a case where prison inmates were forced to nakedness for extended periods of time, §§ 305-306).

[616] See *ex multis* ECtHR [GC], *Nachova and Others v. Bulgaria*, No. 43577/98 and 43579/98, judgment, 6 July 2005 (case concerning the shooting of two Roma fugitives by military police during attempted arrest: '[r]acial violence is a particular affront to human dignity'); IACtHR, *Atala Riffo and Daughters v. Chile*, judgment, 24 February 2012 (case concerning a discrimination based on sexual orientation where the Court applies an earlier *dictum* on equality: 'the notion of equality springs directly from the oneness of the human family and is linked to the essential dignity of the individual', § 79).

reference can be made to some case-law relating to undocumented migrants[617]. *Second*, human dignity works also as an argument *ad addendum*, i.e. allowing for an interpretive expansion of a whole range of rights: this is the case of right to housing[618] and to 'dignified' life[619], to name a few.

Construed as such, human dignity would 'make a merely rhetorical appearance' in IHRL:[620] it would be hard to attach a particular *legal* status to this concept. A rather unspecified 'right to dignity', as an independent, autonomous right that joins other rights, does not seem to exist as such in IHRL.[621] However, it may be argued that by virtue of its indeterminateness

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[617] See for instance IACtHR, *Juridical Condition and Rights of the Undocumented Migrants*, Advisory Opinion OC-18/03, 17 September 2003, § 119: 'the State may grant a distinct treatment to documented migrants with respect to undocumented migrants, or between migrants and nationals, provided that this differential treatment is reasonable, objective, proportionate and does not harm human rights … States may also establish mechanisms to control the entry into and departure from their territory of undocumented migrants, which must always be applied with strict regard for the guarantees of due process and respect for human dignity'.

[618] CESCR, *General Comment No. 4: The Right to Adequate Housing (Art. 11(1) of the Covenant)*, UN Doc. E/1992/23, § 7: 'the right to housing should *not* be interpreted in a *narrow or restrictive sense* which equates it with, for example, the shelter provided by *merely having a roof* over one's head or views shelter exclusively as a commodity. Rather it should be seen as the right to live somewhere in security, peace and *dignity*', italics added. For other examples in the field of adequate food, highest attainable standard of health, work, social security and culture at the universal level, see *amplius* Carozza, *Human Dignity*, cit., 355-356, with references.

[619] The term within brackets is amply used in ACommHPR, *General Comment No. 3 On The African Charter On Human And Peoples' Rights: The Right To Life (Article 4)*, §§ 3, 6, 11, 36, 43. See also IACtHR, *Case of the Yakye Axa Indigenous Community v. Paraguay*, judgment, 17 June 2005 (case regarding a community of indigenous people that were deprived of adequate food, water, and healthcare, and claimed that the respondent State had violated, inter alios, their right to life: '[o]ne of the obligations that the State must inescapably undertake as guarantor, to protect and ensure the right to life, is that of generating minimum living conditions that are compatible with the dignity of the human person and of not creating conditions that hinder or impede it', § 162).

[620] Quoting Carozza, *Human Dignity*, cit., at 358.

[621] See Carozza, *Human Dignity*, cit., at 353 (contending that such approach is not followed in some domestic legal orders – for example Germany and Israel – where a 'right to dignity' is explicitly recognized). The 'right to dignity' is contested as such also from the standpoint of domestic constitutional law: see O'Mahony, *There is no such thing as a right to dignity*, 10 International Journal of Constitutional Law No. 2 (2012), 551-574 (arguing that due to inconsistent formulation and application in domestic legal orders the alleged 'right to dignity' is intermingled with that to 'personal autonomy'). The ambiguity of human dignity both as source of rights and as a right itself has been captured by Waldron, *Dignity*

'human dignity' could stand at least as a general principle of international law or, more specifically, of IHRL.[622]. However, according to many the mere circumstance that human dignity is considered as 'the foundation on which the superstructure of human rights is built' is not enough to conclude that this concept works as a general principle.[623] Defending human dignity's alleged role as provider of a 'convenient language'[624] for pushing for a more developed interpretation of human rights would mean nothing different from employing that concept for purely rhetorical purposes.[625]

Arguably there would be a third way to conceive human dignity in IHRL, namely as a 'normative reference point' pointing to 'some supra-positive value'.[626] This approach would be reflected normatively in a conception of 'general principles' that links them to extra-positive law.[627]

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and Rank. In memory of Gregory Vlastos (1907-1991), 48 Archives Européennes de Sociologie No. 2 (2007), 201-237, at 203 (preferring the term 'duality' to 'ambiguity'). See also Hennette-Vauchez, *A human* dignitas*?*, cit., particularly at 49 ff. (recalling the debate around considering dignity as a particular right in terms of its waiving).

[622] See *amplius* Dworkin, *Taking Rights Seriously*, London-New York, 1977. See also Guastini, *Filosofia del diritto positivo. Lezioni*, Turin, 2017, at 57-65 (describing 'principles' as norms that are fundamental, i.e. axiological and undeserving further justification, and structurally indeterminate, i.e. open-textured, defeasible and generic). In international law 'general principles' can be either *induced* from domestic legal systems (hence the 'general principles of law recognized by civilized nations' ex Art. 38(1)(c) of the ICJ's Statute) or *deduced* 'from international legal logic directly'. On general principles, see *amplius infra*, Chapter IV.

[623] Brownsword, *Human dignity from a legal perspective*, cit., at 3. This approach to human dignity as source of human rights is confirmed by positive IHRL, namely, *inter alia*, the Preamble to ICCPR and ICESCR ('Recognizing that these rights *derive* from the inherent dignity of the human person', italics added). For references in international legal scholarship, see for instance Le Bris, *L'humanité saisie par le droit international public*, Paris, 2012, at 75 ff. (arguing that human dignity and human rights stand as discrete legal entities and that the latter 'joue ainsi un rôle de "catalyseur" dans le sens où elle provoque, par sa seule présence, une mutation de ceux-ci et ce, sans que sa nature n'en soit elle-même modifiée').

[624] See McCrudden, *Human Dignity and Judicial Interpretation of Human Rights*, cit., at 655.

[625] In brief, this is the critical position defended by De Sena, *Dignità umana in senso oggettivo*, cit., at 583-584 (arguing that McCrudden's take is too much imbued with a socio-legal, 'functionalistic' perspective that does not allow for grounding such notion of human dignity in the normative category of 'principles').

[626] Quoting from Carozza, *Human Dignity*, cit., at 358.

[627] See Voigt, *The Role of General Principles in International Law*, cit., at 8 and more generally Henkin, *International Law: Politics, Values and Functions: General Course in Public International Law*, 216 Recueil des Cours de l'Academie de Droit International de la Hague (1989), Dordrecht-Boston-London, at 61 ('[p]rinciples common to legal systems often reflect

From such standpoint, the nexus between law and morality is given emphasis: as has been affirmed, human dignity would form a 'conceptual hinge', a 'portal' through which moral imperatives are imported into law.[628] Albeit appealing, such account of human dignity may sound unconvincing at least for two reasons. *First*, resorting to contrasted notion such as that of 'natural law' seems unnecessary (even counterproductive!) if the ultimate goal of that appeal is to bring new content to treaty norms through interpretation:[629] the same results from conceptions of general principles that are not grounded in such extra-positive dimension.[630] *Second*, and once again, the extremely divergent understandings of the concept impede the attribution of a substantive meaning thereto, which in turn shakes the (pretty much unstable) natural-law foundations of human dignity.

Concluding on this general overview, it seems that in IHRL at least the following assertions can be made on human dignity: (*i*) it surely works as an interpretive tool to broaden the scope of existing human rights, but its substantive content seems so hard to grasp that most commentators are skeptical (*rectius*: agnostic) about the very existence thereof; (*ii*) it is so clung to the particular human right in relation to which it is employed that it ends

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natural law principles that underlie international law'). Further references to general principles in this sense can be found in ICJ, *Case Concerning Pulp Mills on the River Uruguay* (Argentina v. Uruguay), judgment, 20 April 2010, § 52 (Separate Opinion of Judge Cançado Trindade). Another champion of the natural law tradition at the ICJ was Judge Tanaka; see ICJ, *South West Africa Cases (Ethiopia v. South Africa; Liberia v. South Africa)*, judgment, 18 July 1966, at 276 ('it is undeniable that in Article 38, paragraph 1 (c), some natural law elements are inherent. It extends the concept of the source of international law beyond the limit of legal positivism according to which, the States being bound only by their own will, international law is nothing but the law of the consent and auto-limitation of the State'). Judge Tanaka conceives natural law as the opposite of consent-based law. See also his Dissenting Opinion in ICJ, *North Sea Continental Shelf cases (Federal Republic of Germany v. Denmark; Federal Republic of Germany v. the Netherlands)*, judgments, 1969, 172-197 (where he focuses on possible contrasts between natural and positive law).

[628] Quoting from Habermas, *The concept of human dignity and the realistic utopia of human rights*, 4 Metaphilosophy (2010), 464-480, at 469.

[629] In this sense Carozza, *Human Dignity*, cit., at 358.

[630] Such as, for instance, the position held by See also Bassiouni, *A Functional Approach to 'General Principles of International Law'*, cit., whose analysis of how general principles functions in practice (in particular when it comes to filling gap in existing law) is meant to 'provide a more objective basis than the value-laden natural law philosophy', at 774.

up being redundant for ascertaining the violation thereof.[631] Resorting to human dignity may turn out to be a *circular* argument in these cases. However, it is argued that a specific understanding of dignity may help frame a particular human right (such as the right to life) as covering a new set of cases that would remain as such outside its scope.

3.4.3 'Human Dignity' in the Debate on LAWS

The concept of 'human dignity' has proved to be a particularly effective weapon in the arsenal of those who oppose the development of LAWS. As captured in quite effective terms by Heyns, framing the issue in the light of 'human dignity' takes precedence on other arguments, as it replaces the '*can* they do it?' question with the (far more impellent) '*should* they do it?' question.[632] In other words, if the fact that the ultimate decision on whether or not to engage a particular target runs *as such* counter human dignity, then it would not matter if LAWS comply with other rules of international law (IHRL and IHL as well), as they would be *ipso facto* proscribed. It is therefore of paramount importance to understand for which purposes the concept of

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[631] A telling example of the latter aspect is provided by regional case-law in the field of arbitrary resort to force against an individual, where references to human dignity does not seem to go beyond a mere *ad abundantiam* argument. See for instance *Bouyid v. Belgium* [GC], cit., § 100: 'where an individual is deprived of his or her liberty or, more generally, is confronted with law-enforcement officers, any recourse to physical force which has not been made strictly necessary by the person's conduct diminishes human dignity', and § 101: 'any conduct by law-enforcement officers vis-à-vis an individual which diminishes human dignity constitutes a violation of Article 3 of the Convention'. Unpacking the Court's reasoning, a violation of human dignity results solely from an unnecessary use of force, which as such violates Art. 3 ECHR. The concept of 'human dignity' that emerges from this line of reasoning and the human right enshrined in Art. 3 ECHR are therefore overlapping and ultimately impossible to be kept distinct, which makes our contention right. See amplius Webster, *Interpretation of the Prohibition of Torture*, cit., *passim*.

[632] See Heyns, *Autonomous weapons systems: living a dignified life and dying a dignified death*, in Bhuta et al. (eds.), *Autonomous Weapons Systems*, Cambridge, 2016, 3-12, particularly at 10: 'there may be an implicit requirement in terms of international law and ethical codes that only human beings may take the decision to use force against other humans. The implication of this approach bears emphasis. If there is such a requirement, then even if the correct target is hit and the force used is not excessive – and, in that sense, the explicit requirements of international law are met in a formal way – it will remain *inherently* wrong for a machine to make the determination that such force be used against a human being' (italics added).

human dignity is resorted to in the debate around LAWS, considering in turn (*i*) State practice at the international level, (*ii*) other non-State practice and (*iii*) relevant scholarship.

As for States, references to human dignity are scattered and cursory. At the CCW Germany was the first to explicitly refer to human dignity during the 2014 MoE: the 'right to dignity' was used as an argument to argue for the need for a 'principle of human control' over autonomous weaponry.[633] At the 2015 MoE references to 'human dignity' were made by Chile[634] and Ecuador[635], as well as by Sri Lanka[636] and Costa Rica[637] at the 2016 MoE, and by Brazil[638] at the 2017 GGE; lastly, at the 2018 GGE it was Greece's turn.[639] 'Human dignity' has been employed either as an

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[633] See https://www.unog.ch/80256EDD006B8954/(httpAssets)/9FB02F665072E11AC1257CD70066D830/$file/Germany+LAWS+2014.pdf ('For Germany, this principle of human control is the foundation of the entire international humanitarian law. It is based on the right to life, on the one hand, and on the right to dignity, on the other. Even in times of war, human beings cannot be made simple objects of machine action').

[634] https://www.unog.ch/80256EDD006B8954/(httpAssets)/A61BC7B145D5C3E4C1257E26005CF1B2/$file/2015_LAWS_MX_Chile.pdf (stressing the importance of '[l]la constante evolución en la valoración del bien jurídico protegido que es la dignidad y la vida humana').

[635] https://www.unog.ch/80256EDD006B8954/(httpAssets)/8FD4D07ECAF70100C1257E26005E147F/$file/2015_LAWS_MX_Ecuador.pdf (arguing that it is important to tackle several aspects associated with LAWS, among which 'las características de estas armas, su inconguencia con el Derecho Internacional Humanitario y con los derechos humanos como el derecho a la vida y a la dignidad').

[636] https://www.unog.ch/80256EDD006B8954/(httpAssets)/3C6DB800C1A0D79AC1257F9200574C75/$file/2016_LAWS+MX_GeneralExchange_Statements_Sri+Lanka.pdf (citing the work of the Special Rapporteur, and underscoring that resorting to LAWS in law-enforcement scenarios 'could pose serious violations of human rights, in particular the right to life and dignity').

[637] https://www.unog.ch/80256EDD006B8954/(httpAssets)/CC4712113BA981C7C1257F9B002CF165/$file/2016_LAWS+MX_HREthicalIssues_Statements_CostaRica.pdf ('[l]as [*sic*] utilización de estas armas podría tener repercusiones para el derecho a la vida, el derecho a la integridad física, el derecho a la dignidad humana y el derecho a la reparación').

[638] https://www.unog.ch/80256EDD006B8954/(httpAssets)/A0B7B1C9846B02F9C125823B00452D57/$file/2017_GGE+LAWS_Statement_Brazil.pdf (arguing for an 'integrated approach to determining the legality of such systems, taking into account the relationship between IHL, International Human Rights Law, and *fundamental overarching principles* as human dignity', italics added).

[639] https://www.unog.ch/80256EDD006B8954/(httpAssets)/3B8A2778AB92E456C12582720056F151/$file/2018_LAWSGeneralExchange_Greece.pdf ('it is important to ensure that

independent 'right' – distinct from, say, the right to life – or as a 'principle', without further exploring both the content and the scope of the concept. Recalling what has been highlighted above, conceiving human dignity as an independent 'right' requires sound *normative* arguments, at least in IHRL; the same goes when the category of 'principle' or 'general principle' comes into play. On the contrary, other States have employed 'human dignity' only in relation to ethics or more generally in a sense that discards any possible legal significance.[640] What emerges from the following is that States – main actors in the international legal order – have not developed a clear normative understanding of what 'human dignity' is (and what it may require or entail) when it comes to LAWS.

commanders and operators will remain on the loop of the decision making process in order to ensure the appropriate human judgment over the use of force, not only for reasons related to accountability but mainly to protect human dignity over the decision on life or death'.

[640] It is possible to cite the Statements made at the 2015 MoE by France and Denmark, which are particularly telling in this sense. As for France, see https://www.unog.ch/80256EDD006B8954/(httpAssets)/D7D84A60ADAC158CC1257E26005E532F/$file/2015_LAWS_MX_France.pdf (listing possible grounds for discussing LAWS and including 'la question de la dignité humaine' in the ethical standpoint); as for Denmark, see https://www.unog.ch/80256EDD006B8954/(httpAssets)/C5B8B0A4AD379822C1257E26005D7D20/$file/2015_LAWS_MX_Denmark.pdf (labeling 'dignity' as one of the 'almost poetical expressions' put forward in the debate so far).

As far as non-state actors are concerned, 'human dignity' has been so far employed by UNIDIR[641], Human Rights Watch[642], ICRAC[643], PAX[644], Women's International League for Peace and Freedom[645], the Universidad Pablo de Olavide de Sevilla[646] and more extensively by the ICRC[647]. Again,

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[641] https://www.unog.ch/80256EDD006B8954/(httpAssets)/4E524A61D7F205FAC1257CD7005DC383/$file/UNIDIR_MX_LAWS_2014.pdf ('[i]t is crucial to give significant consideration today to the question "If a weapon system were ABLE to do X, would we WANT it to do so?" This question offers opportunity for reflection that go beyond legal assessments to other *fundamental considerations* such as the right to life and protection of human dignity', italics added).

[642] https://www.unog.ch/80256EDD006B8954/(httpAssets)/6CF465B62841F177C1257CE8004F9E6B/$file/NGOHRW_LAWS_GenStatement_2014.pdf ('[w]e found that fully autonomous weapons would threaten the most fundamental rights and principles under international law, including the right to life, right to a remedy, and the *principle of human dignity*', italics added).

[643] Which stands for the International Committee for Robot Arms Control; see https://www.unog.ch/80256EDD006B8954/(httpAssets)/8A68157979FEFBB6C1257CD7006AB5FD/$file/NGO+ICRAC+MX+LAWS.pdf (urging States 'to be guided by the principles of humanity in its [*sic*] deliberations on existing and emerging weapons technology – taking into account considerations of human security, human rights, human dignity, humanitarian law and the public conscience').

[644] https://www.unog.ch/80256EDD006B8954/(httpAssets)/B1C6A315D3ED0F15C1257CD7006AC91B/$file/NGO+PAX+MX+LAWS.pdf ('[w]e view fully autonomous weapons as an affront to human dignity and the sacredness of life … these weapon systems go against the principles of human dignity. Not only the dignity and right to life of those who will be directly affected, but also the dignity of civilians and soldiers in which [*sic*] name these weapons will be deployed … this ethical objection is so important that even if these machines would in theory be able to comply with international law, we should not allow them to be developed').

[645] https://www.unog.ch/80256EDD006B8954/(httpAssets)/BF60D63DBB4F2E45C1257CD7006AD2BC/$file/NGO+WILPF+MX+LAWS.pdf ('[b]eyond the law, giving machines power to target and kill human beings crosses a moral line. It cheapens human life and reduces human dignity. It is, at its essence, inhumane treatment').

[646] https://www.unog.ch/80256EDD006B8954/(httpAssets)/5E8FEA2520A4E522C1258272005897D0/$file/2018_LAWS6d_Universidad+Pablo+de+Olavide+de+Sevilla.pdf
(commenting on the technological challenges posed by A.I. and arguing that 'se trata de cuestiones que afectan a la dignidad humana' and discussing about 'valores fundamentales de respeto e intangibilidad de la dignidad humana como un prius de cualquier actividad científica').

[647] https://www.unog.ch/80256EDD006B8954/(httpAssets)/57F74DA8315842D5C1258272005680 37/$file/2018_LAWSGeneralExchange_ICRC.pdf ('[t]he ethical concerns around loss of human agency in decisions to use force, diffusion of moral responsibility and loss of human dignity could have far-reaching consequences'). As for the ICRC's position, see more extensively the Report *Ethics and autonomous weapon systems: An ethical basis for human control?*, Geneva, 3 April 2018, available at: https://www.icrc.org/en/document/ethics-and-autonomous-weapon-systems-ethical-basis-human-control.

no clear indications are inferable from these statements, as they tend to conflate ethical and legal arguments.

Turning to legal scholarship, more principled reflections on the normative content of human dignity have been proposed. Heyns, former UN Special Rapporteur, has written extensively on the topic.[648] In his view, while acknowledging that human dignity may operate 'as a "conversation stopper", because of the tendency of people to read their own preferences into it', it makes sense to speak about a right to dignity on its own.[649] A normative basis for such understanding of human dignity is provided for by the ACHPR; however, the conceptual difficulties that have been outlined before remain.[650] Heyns' reflections are particularly important as they deal extensively with the *axiological* dimension of human dignity, which he applies to LAWS with a view to showing that autonomous killing reduce an individual 'to numbers: the zeros and the ones of bits'.[651]

More importantly, in the case of LAWS human dignity would be at stake because autonomous killing does not leave open the possibility of *hope*: at the moment when a particular determination is made about an individual (i.e. to shoot or not to shoot), then further self-restraint is not possible if that decision has to be taken by a machine. ATC is a process in which every step is causally linked to the previous:[652] if external circumstances do not change, the final outcome will not as well. In brief:

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[648] The official statement of Heyns' position on LAWS is contained in Heyns, *Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns*, 9 April 2013, A/HRC/23/47, §§ 92 ff., particularly at § 95 ('[d]eploying LARs has been depicted as treating people like "vermin", who are "exterminated." These descriptions conjure up the image of LARs as some kind of mechanized pesticide', references omitted).

[649] See Heyns, *Human Rights and the use of Autonomous Weapons Systems*, cit., at 367-368.

[650] *Ibidem*, at 368 (citing as examples death penalty, imprisonment without parole, and the well-known German Air Security case of 2006). In the view of the writer, conceptual difficulties associated with construing human dignity as a right as such remain: domestic case-law and international documents refer to much divergent notions and uses of human dignity, which hinders any *reductio ad unum*.

[651] *Ibidem*, at 370. See also Heyns Report, cit., § 95 (arguing that entrusting machines with the power to take decisions resulting in the receiver's death paints an imagine of LAWS 'as some kind of mechanized pesticide').

[652] See *supra* Chapter I.

pietas cannot be translated into algorithms. To justify his position, Heyns draws an interesting parallel with death penalty that though seems to work only partially, given the radically different contexts in which respective decisions are taken.[653] In addition, no other *legal* justifications are provided.[654] Normatively speaking, it therefore seems that Heyns' interpretation of human dignity as requiring hope to be virtually exercised at each lethal decision, *yet principled*, is *de jure condendo*.

Other authors support an analogous position – and face analogous problems. One has contended that since human dignity, at first understood merely as a 'social value', has become a 'constitutional value' and 'right' as well, autonomous killing where human deliberation is absent is believed to violate human dignity.[655] Another scholar has written extensively on the Kantian foundation of human dignity, and contends that to entrust a non-human agent with targeting humans would amount to treat the potential victim as 'mere relative ends that can be subjected to efficient disposal'.[656] When justifying the normative status of human dignity, the author resorts

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[653] Quoting Heyns, *Human Rights and the use of Autonomous Weapons Systems*, cit., at 371: '[h]ope, often against the odds, is an important part of our psychological makeup and dealing with the harshness of reality. A sentence of life without parole, for example, like the death penalty, can be seen as a violation of dignity because it means "writing off" the person, not leaving open the possibility of hope'. While it may be interesting to deepen the connection between LAWS and death penalty and its grounds of incompatibility with several human rights recognized by IHRL, one preliminary distinction must be made that is suitable to neutralize the argument's efficacy, namely that the contexts in which LAWS will be operated – such as law-enforcement operations requiring split-second decisions – are radically different from those in which death penalty is inflicted.

[654] Even more telling is the Author's argument in Heyns, *Autonomous weapons in armed conflict and the right to a dignified life*, cit., at 63 (in which he justifies appeal to hope basing on the fact that hope is an 'important measure of optimism' as emphasized by 'psychologists', 'religious and other world views, as well as philosophical traditions').

[655] See Chengeta, *Dignity, ubuntu, humanity and autonomous weapon systems (AWS) debate: an African perspective*, 13 Brazilian Journal of International Law No. 2 (2016), 461-502, at 477-484. The Author (and Heyns' scholar) makes ample reference to philosophical tradition (such as the notion of 'ubuntu'), domestic case-law and constitutional literature on human dignity; in particular, he underscores that the fact that the notion of human dignity remains so undefined is actually advantageous as it provides counter-arguments against those who support LAWS and consider notions such as that of human dignity as powerless.

[656] See Ulgen, *Human Dignity in an Age of Autonomous Weapons: Are We in Danger of Losing an "Elementary Consideration of Humanity"?*, ESIL Conference Paper No. 15/2016, at 19.

to the concept of 'elementary considerations of humanity', enshrined in some ICJ's case-law,[657] arguing that human dignity would be part of such considerations.[658] This, however, only shifts the question without providing an answer: are 'elementary considerations of humanity' a normative source as such?[659] It follows that considering a prohibition on LAWS as stemming from them is, again, a *de jure condendo* operation – one in which referring to human dignity sounds as rhetorical.

Let us now draw some conclusions on human dignity. As a normative concept – i.e. suitable for arguing that LAWS are as such incompatible with IHRL – human dignity is quite contestable. On the one hand, existing law, most human rights bodies' case-law and legal scholarship refers to a notion of human dignity that is too tied to particular human rights to have an autonomous standing. On the other hand – especially in the debate around LAWS –, human dignity is often used as a moral 'modulator'[660] aimed to translate ethical imperatives into normative terms. This results in pretty ambiguous (or suspicious) understandings of human dignity that fuel more heated discussions on the topic. Arguing that LAWS would run counter human dignity conceived in its minimal content does not remove the supporters' objection: *which notion* of human dignity is actually being translated into a *normative* concept prohibiting LAWS? In our view, human dignity may (*rectius*: should) be used to avert the development and deployment of LAWS, but it is necessary that a more principled reflection on it – so as that it can embrace autonomous killing – is pushed forward.

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[657] See ICJ, *Corfu Channel Case*, judgment, 9 April 1949, I.C.J. Reports 1949, 4, at 22; *Nuclear Weapons*, cit., § 79.

[658] See Ulgen, *Human Dignity in an Age*, cit., *passim*.

[659] On elementary considerations of humanity, see Dupuy, *Les "considerations élémentaires d'humanité" dans la jurisprudence de la Cour internationale de Justice*, in Dupuy (ed.), *Droit et Justice. Mélanges offerts à N. Valticos*, Paris, 1999, 117-130; Le Bris, *L'humanité saisie*, cit..

[660] The expression is quoted from Besson, *General Principles in International Law*, cit., at 47.

3.5 Human Dignity and the Principle of Humanity. A Joint Appraisal.

Before turning to the conclusions of the present Chapter, it seems appropriate to compare our findings on IHRL to our previous analysis under IHL. First, the interplay between the two legal systems will be briefly analyzed (3.5.1); second, their 'common denominator' will be outlined with a view to demonstrating that our conclusions on LAWS are valid with respect of both of them (3.5.2).

3.5.1 Theories on the Relationship between IHL and IHRL

The issue of the interplay between IHRL and IHL has been paid extensive attention by scholars.[661] The idea of 'law of war' (*jus in bello*) and 'law of peace' being discrete legal systems, with little to no points of contact, can be traced back to Grotius – who gave his masterpiece the title *De Jure Belli ac Pacis*.[662] At least since the aftermath of World War II the doctrinal approach has got more nuanced, and still today conceives of the two legal systems as being intertwined to a certain degree.

The traditional theory is the so-called 'separation' theory, whose supporters argue that either the *corpus juris* of the law of peace or that of the law of war is applicable depending on the state of international relations. They stand as irremediably incompatible, as Draper famously stated some fifty years ago.[663] Yet evoked at times still today,[664] the 'separation' theory is no longer supportable, as the rise of the human rights movement during the 1960s and 1970s led to an increasingly stronger convergence of IHL and

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[661] See more extensively Heintze, *Theories on the relationship between international humanitarian law and human rights law*, in Kolb-Gaggioli, *Research Handbook on Human Rights and Humanitarian Law*, Cheltenham-Northampton, 2013, 53-64.

[662] Quoted in Kolb, *Human rights law and international humanitarian law between 1945 and the aftermath of the Teheran Conference of 1968*, in Kolb-Gaggioli, *Research Handbook on Human Rights and Humanitarian Law*, Cheltenham-Northampton, 2013, 35-52, at 36.

[663] Draper, *Humanitarian Law and Human Rights*, in Meyer-McCoubrey (eds.), *Reflections on Law and Armed Conflicts*, cit., at 145-150, at 149: '[t]he attempt to confuse the two regimes of laws is unsupportable in theory and inadequate in practice. The two regimes are not only distinct but are *diametrically opposed*', italics added.

[664] See for instance Heintze, *Theories on the relationship*, cit., at 55.

IHRL.[665] Some argue that such approach was sponsored by the ICJ in its landmark Advisory Opinion in the *Nuclear Weapons* case, where it stated that the ICCPR (and namely the right to life enshrined therein) continued to operate in time of armed conflict, and that IHL served as *lex specialis* to interpret the IHRL provision.[666] The resort to the concept of *lex specialis* admittedly served to 'dismiss the relevance of human rights altogether' in that specific case.[667]

Many support a different theory, according to which the two bodies of law, while remaining discrete and divergent in roots and approaches, 'can complete each other on specific points'.[668] The 'complementarity' theory is thus based on a case-by-case comparative approach aimed at reinforcing, enhancing or better interpreting the applicable rules.[669] Maybe surprisingly the ICJ turned to this second theory less than a decade after the

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[665] See Kolb, *Human Rights Law*, cit., at 44-46 (pointing out that such 'progressive convergence' was due, among others, to the 'humanitarianism' that the Geneva Conventions were imbued with: '[t]he IHL of the Geneva period is rooted in the ideal of "humanitarism". Hence, progressive interrelationships with [I]HRL quickly became unavoidable').

[666] See ICJ, *Nuclear Weapons*, cit., § 25: 'The Court observes that the protection of the International Covenant of Civil and Political Rights does not cease in times of war, except by operation of Article 4 of the Covenant whereby certain provisions may be derogated from in a time of national emergency. Respect for the right to life is not, however, such a provision. In principle, the right not arbitrarily to be deprived of one's life applies also in hostilities. The test of what is an arbitrary deprivation of life, however, then falls to be determined by the applicable *lex specialis*, namely, the law applicable in armed conflict which is designed to regulate the conduct of hostilities. Thus whether a particular loss of life, through the use of a certain weapon in warfare, is to be considered an arbitrary deprivation of life contrary to Article 6 of the Covenant, can only be decided by reference to the law applicable in armed conflict and not deduced from the terms of the Covenant itself'.

[667] In the words of Gowlland-Debbas&Gaggioli, *The relationship between international human rights and humanitarian law: an overview*, in Kolb-Gaggioli, *Research Handbook*, cit., 77-94, at 85 (more generally arguing that the concept of *lex specialis* was intended to operate not only as a interpretative aid, but more fundamentally as an exclusionary principle).

[668] See Heintze, *Theories on the relationship*, cit., at 57.

[669] See Kolb, *Human Rights*, cit., at 46: '[i]n some areas, [I]HRL complements IHL; in other areas, IHL strengthens or inspires [I]HRL. One branch of the law frequently serves to interpret the other'. This seems to be the approach endorsed by the ILC: see *Report of the Study Group on Fragmentation of International Law: Difficulties Arising from the Diversification and Expansion of International Law* (13 April 2006) UN Doc A/CN.4/L.682, §§ 102-103.

Nuclear Weapons case. In the 2004 Advisory Opinion in the *Wall* case, the ICJ took a leap forward in acknowledging that IHL and IHRL may concur in regulating a given situation.[670]

More recently, a third theory begun to surface in the scholarship that would tend to focus on the similarities between the two *corpora juris* rather than framing their relationship in terms of *lex generalis/lex specialis*. The 'harmonization' theory aims to 'eliminate or tone down the differences between them',[671] and is grounded in the idea that systemic integration is preferable.[672] IHL and IHRL sometimes so overlap that it is impossible to keep the respective obligations entirely separated, rather forming an *unicum*.[673]

While it has been demonstrated that the adoption of one theory instead of others *does* have an impact on the interpretation of legal obligations – such as the duty to investigate arbitrary deprivations of life in armed conflict –,[674] this is all the more important as fundamental principles of both branches of law come under consideration.

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[670] ICJ, *Legal Consequences of the Construction of a Wall in the Occupied Palestine Territory*, Advisory Opinion, 9 July 2004, § 106: '[m]ore generally, the Court considers that the protection offered by human rights conventions does not cease in case of armed conflict. … As regards the relationship between international humanitarian law and human rights law, there are thus three possible situations: some rights may be exclusively matters of international humanitarian law; others may be exclusively matters of human rights law; yet others may be matters of both these branches of international law. In order to answer the question put to it, the Court will have to take into consideration both these branches of international law, namely human rights law and, as *lex specialis*, international humanitarian law'.

[671] See Gaggioli, *A legal approach to investigations of arbitrary deprivations of life in armed conflicts: The need for a dynamic understanding of the interplay between IHL and HRL*, 36 QIL Zoom-In (2017), 27-51, at 36.

[672] As noted by Gowlland-Debbas&Gaggioli, *The relationship*, cit., at 87, the legal basis for this theory can be traced back to the ILC Report quoted above and lies on the provision of Article 31, par. 3, of the Vienna Convention on the Law of Treaties.

[673] See for instance Heintze, *Theories on the relationship*, at 61-62 (discussing the example of the 1989 Convention on the Right of the Child).

[674] This is the case examined by Gaggioli, *A legal approach*, cit., *passim*, who concludes that when it comes to the procedural obligation stemming from the IHRL norms protecting the right to life, a 'progressive approach' attaching more importance to IHRL as a more developed branch of law than IHL has to be welcomed.

3.5.2 The Convergence of IHL and IHRL towards a 'Common Denominator'

The move from a 'separation' theory to an 'integration' theory is arguably due to the 'natural convergence of the humanitarian principle underlying these two bodies of law'.[675] In brief, irrespective even of the theory that one would adopt to address the relationship between IHL and IHRL, they seemingly have a 'common origin' from which they spring and articulate.

The relevance of such 'common origin' is backed by some normative provisions, international case-law and doctrinal reflections. To begin with, the draft preamble adopted by the Stockholm Conference for the four Geneva Conventions referred to the '[r]espect for the personality and the *dignity* of human beings' as 'the main principle underlying all the humanitarian Conventions'. While the proposal of a common substantive preamble was eventually discarded due to difficulty to achieve an unanimous agreement, the idea of IHL and IHRL being mutually linked started to gain traction.[676] Common Art. 3, which is still considered as the core IHL provision for the regulation of non-international armed conflicts, establishes a set of duties incumbent upon States applicable 'as a minimum'.[677] That the 'minimum' justifying the regulation of a matter traditionally considered by States as being exclusively their domestic affair is rooted in the 'common origin' shared by IHL and IHRL is made clear in APII's Preamble.[678] International judicial and quasi-judicial bodies have

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[675] As put by Stephens, *Human Rights and Armed Conflict: The Advisory Opinion of the International Court of Justice in the Nuclear Weapons Case*, 4 Yale Human Rights and Development Law Journal No. 1 (2001), 1-24, at 2.

[676] See *amplius* Clapham, *The Complex Relationship Between the Geneva Conventions and International Human Rights Law*, in Clapham-Gaeta-Sassoli, *The 1949 Geneva Conventions. A Commentary*, Oxford, 2015, 701-736. See also ICRC's Commentary to GC(I), 2016, available at: https://ihl-databases.icrc.org/ihl/full/GCi-commentary, §§ 127-128.

[677] See Art. 3 and ICRC's 2017 Commentary on GC(II), available at: https://ihl-databases.icrc.org/ihl/full/GCII-commentary.

[678] See APII, cit., claiming that 'the humanitarian principles enshrined in Article 3 […] constitute the foundation of *respect for the human person* in cases of armed conflict not of an international character', italics added. See also API, Art. 72 ('provisions of this Section are additional to […] other applicable rules of international law relating to the protection of fundamental human rights during international armed conflict')

stressed the 'common origin' at various times.[679]. Legal scholarship as well favors the 'common origin' approach: Pictet endorsed the universal applicability of a 'minimum of humanity',[680] while Meron acknowledged that in spite of their divergent 'historical and doctrinal roots' IHL and IHRL share the 'principle of humanity' as a 'common denominator'.[681] More recently, one has argued that '[t]he treatment dispensed to human beings, in any circumstances, ought to abide by the *principle of humanity*, which permeates the whole *corpus juris* of the international protection of the rights of the human person'.[682]

In our understanding, this means that the notion of 'human dignity' in IHRL and that of 'humanity' in IHL stem from the same 'common denominator'. Such circumstance may help ongoing discussions on LAWS, especially in the CCW forum, which instead tend to be too narrow-focused on IHL rules. Assuming that the principle of humanity and that of human dignity both operate as a 'modulator' of moral imperatives into the

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[679] In the famous *Corfu Channel* case, the ICJ asserted the existence of '*elementary considerations of humanity*, even more exacting in peace than in war': see ICJ, *Corfu Channel*, cit., § 21-22, italics added. See also *Nicaragua* case, § 218 (where the Court stated that the guarantees enshrined by Common Art. 3 reflected a 'minimum yardstick' constituting 'fundamental general principles of humanitarian law'); *Nuclear Weapons* case, cit., § 79 (arguing that 'great many rules' of IHL are 'fundamental to the respect of the human person and "elementary considerations of humanity"'). It was however the ICTY that better expressed this idea: see ICTY, *Mucic et al.*, Appeals Chamber, Judgment, 20 February 2001 (Case No. IT-96-21-A), § 149 ('[b]oth human rights and humanitarian law focus on respect for human values and the *dignity of the human person*. Both bodies of law take as their *starting point* the concern for human dignity, which forms the basis of a list of fundamental minimum standards of humanity. … The universal and regional human rights instruments and the Geneva Conventions share a *common "core"* of fundamental standards which are applicable at all times, in all circumstances and to all parties, and from which no derogation is permitted'). See also ICTY, *Celebici* case, Trial Chamber, Judgment, 16 November 1998 (Case No. IT-96-21), § 543; ICTY, *Blaskic*, Trial Chamber, Judgment, 3 March 2000, § 154; ICTR, *Akayesu*, Trial Chamber, Judgment, 2 September 1998, § 565-566; ICTR, *Kambanda*, Trial Chamber, Judgment, 4 September 1998, §§ 15-16; ICTR, *Serushago*, Judgment, 5 February 1999, § 15.

[680] See Pictet, *Développement et principes du droit international humanitaire*, Geneva, 1983, at 73-74.

[681] See Meron, *The Humanization of Humanitarian Law*, cit., at 6.

[682] See Cançado Trindade, *Some reflections on the principle of humanity in its wide dimension*, in Kolb-Gaggioli, *Research Handbook*, 188-197, at 189.

respective legal systems, it is easy to conclude that they would 'translate' the same demand, namely that decisions impacting on human life are not entrusted to non-human subjects. This is however with no prejudice to the fact that such demand is effectively *acknowledged* by the international community.

3.6 Closing Remarks

Summarizing what has been argued throughout this Chapter, the debate on LAWS's compatibility with IHRL can be framed as follows.

First, in order for LAWS to be developed and deployed in IHRL-relevant fields (such as law-enforcement operations) they must comply with IHRL rules as they result from customary law and treaty law in first place. It can be concluded that *although the bar is set pretty high*, it is not impossible for future LAWS to comply with IHRL regulating the use of force.

Second, the issue whether LAWS 'can' operate in accordance with IHRL does not solve the more pressing issue whether they 'should' operate at all. The latter question undoubtedly has a moral connection. Human dignity in IHRL – and humanity in IHL – has thus demonstrated a quite useful tool in the hands of those who oppose LAWS from a more radical standpoint. In strict legal terms, however, human dignity is easier to attack as it lacks a precise normative content. In this perspective references to vague notions of human dignity, yet principled, may stand as *de jure condendo* auspice rather than statement of existing law: they have an *optative* (i.e. expressing a subjective desire) meaning, not an *indicative* (i.e. describing an actual circumstance) one.

Chapter IV

'MEANINGFUL HUMAN CONTROL': A CRITICAL APPRAISAL OF A 'WAY FORWARD'

SUMMARY: 4.1 Introduction – 4.2 MHC in the Debate: 'Narrow' and 'Broad' Understandings. – 4.3 MHC as a Tool for Assigning Responsibility. – *4.3.1. Individual Responsibility*. – *4.3.2 Corporate Responsibility*. – *4.3.3 State Responsibility*. – *4.3.3.1 The 'Subjective' Element*. – *4.3.3.2 The 'Objective Element; In Particular, The Plea of* Force Majeure. – *4.3.3.3 The Element of 'Fault' and the Concept of 'War Torts'*. – *4.3.3.4 Reparations*. – 4.3.4 Conclusion on Responsibility. – 4.4 MHC as a Tool for Preserving Human Deliberation. – 4.5 Legal Nature of MHC. – *4.5.1 MHC as Treaty and Customary Law*. – *4.5.2 MHC as a General Principle of International Law*. – *4.5.3 MHC* Qua *Programmatic Principle?* – 4.6 Concluding Assessments.

Human beings! What are they to you?
Cyphers to count withal—no more!
(Schiller, *Don Carlos*, Act V, Scene X, 1787)

4.1 Introduction

The *proprium* of LAWS technology is that critical functions of the weapon – target selection and engagement – may be entrusted to non-human agents in full. The previous Chapters have shown that virtually all international actors involved in the discussions around LAWS are concerned about the risks associated with removing human agents from the 'loop'. It is a really cross-cutting concern.[683] Those who oppose the development of LAWS naturally emphasize the dangers connected with removing human-decision making: loss in compliance with IHRL and IHL, as the nature of ATC (i.e.

[683] See Crootof, *A Meaningful Floor for "Meaningful Human Control"*, 30 Temple International and Comparative Law Journal No. 1 (2016), 53-62, at 53 (starting off with the claim that '[t]o the extent there is any consensus among States, ban advocates, and ban skeptics regarding the regulation of [LAWS], it is grounded in the idea that all weaponry should be subject to [MHC]').

categorical) would be at odds with requirements for using lethal force; difficulty to distribute accountability in cases of malfunctioning resulting in IHRL/IHL violations; strong deontological aversion to autonomous killing as such. Surprisingly maybe, also supporters assert that human control – in some forms – will be maintained over LAWS. The need for maintaining such human control has find expression in the concept of 'Meaningful Human Control' (hereinafter: MHC).[684]

The debate on MHC – especially at the CCW forum – has been ongoing for years, and may now have come of age, as is reflected in a more 'mature' approach to MHC that has been recently adopted.[685] The aim of this last Chapter is therefore to explore the concept of MHC and the numerous understandings thereof, with a view to assessing if it may play a

[684] See for instance the skeptical position expressed by the US Delegation at the closing of the 2014 MoE: '[t]here have been many references this week to the notion of [MHC]. But from our perspective, this formulation does not sufficiently capture the full range of human activity that takes place in weapons systems development, acquisition, fielding and use'. The US had however acknowledged that 'it is important to remind ourselves that machines do not make decisions; rather, they receive inputs and match those against human programed parameters'. To a certain (limited, as will be explained below) extent, MHC is recognized also by the US. See http://www.unog.ch/80256EDD006B8954/%28httpAssets%29/6D6B35C716AD388CC1257CEE004871E3/$file/1019 (audio file). Another interesting position is that of the Russian Federation, which starting from the first GGE has repeatedly asserted its skepticism towards the adoption of a legal document (either binding or not) regarding LAWS due to lack of common understanding of key elements. This notwithstanding, the Russian Delegation declared that they 'do not doubt the necessity of maintaining human control over the machine'; see *Russia's Approaches to the Elaboration of a Working Definition and Basic Functions of Lethal Autonomous Weapons Systems in the Context of the Purposes and Objectives of the Convention*, CCW/GGE.1/2018/WP.6, 4 April 2018, § 11.

[685] For an early conceptualization of MHC, see UNIDIR, The *Weaponization of Increasingly Autonomous Technologies: Considering How Meaningful Human Control might move the discussion forward*, UNIDIR Resources No. 2, 2014, 1-9. To name a feature that is particularly indicative of this maturity, the concept of MHC has been declined in terms of 'human-machine' interaction, an aspect that had not been given specific attention during the MoE. For a more recent appraisal of the topic, see for instance the Report of the 2017 GGE, CCW/GGE.1/2017/CRP.1, 20 November 2017, at 7: '[t]he importance of considering LAWS in relation to human involvement and the human-machine interface was underlined. The notions that human control over lethal targeting functions must be preserved, and that machines could not replace humans in making decisions and judgements, were promoted. Various related concepts, including, *inter alia*, meaningful and effective human control, appropriate human judgement, human involvement and human supervision, were discussed'.

normative role. This will require a preliminary explanation of how the concept was born in the debate (4.2), its purposes (4.3 and 4.4), and eventually its legal significance (4.5).

4.2 MHC in the Debate: 'Narrow' and 'Broad' Understandings

The fact that MHC is a concept so widespread in the debate on LAWS has led to a plethora of understandings, resulting in the difficulty to reach an universally accepted definition.[686] Such indefiniteness is helpful when it comes to reaching broad agreement in international *fora*; on the contrary it has a boomerang effect when it comes to analyze MHC from a normative standpoint. The strength of MHC is also its Achilles' heel. However, it seems possible to divide the numerous understandings of MHC between two macro-categories at least ('narrow' and 'broad'), the dividing line consisting in the presence of human deliberation at individual uses of force *at a minimum*.

The first to employ the concept of MHC was a UK-based NGO, Article 36, which back in 2013 released a Paper commenting on UK's policy on LAWS.[687] Participating in the 2014 MoE, Article 36 stressed the importance of preserving 'deliberative moral reasoning, by human beings, over individual attack'; again, the NGO's Representative specified that it

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[686] See Crootof, *A Meaningful Floor*, cit., at 55-56 ('there are nearly as many understandings of what [MHC] entails as there are writers on the subject'); Ekelhof, *Complications of a Common Language; Why it is so Hard to Talk about Autonomous Weapons*, 22 Journal of Conflict and Security Law No. 2 (2017), 311-331. For a critical appraisal of a too vague notion of MHC, see Anderson-Waxman, *Debating Autonomous Weapon Systems, Their Ethics, And Their Regulation Under International Law*, in Brownsword-Scotford-Yeung (eds.), *The Oxford Handbook of Law, Regulation and Technology*, Oxford, 2017, 1097-1117, at 1113 (warning against relying on ambiguous notions, as albeit 'strategic' they naturally tend to end 'in disappointment': '[a]t some point, the contradictions can no longer be elided').

[687] See Article 36, *Killer Robots: UK Government Policy On Fully Autonomous Weapons*, available at: http://www.article36.org/wp-content/uploads/2013/04/Policy_Paper1.pdf. As a methodological remark, in the following we will prioritize early Statements or similar; we will refer to more recent statements only when they add noteworthy elements to the understanding of MHC.

lies within the very essence of IHL to have 'human commanders (…) to make *deliberative case by case* [judgments] on the legality of *individual* attacks'.[688] We can name this understanding of the concept 'narrow-MHC', meaning that the *quantum* of human presence at each application of lethal force is at its highest level, as human agents (namely, the 'commander') have to participate: (*i*) actively ('deliberative'), which excludes purely nominal intervention;[689] (*ii*) in actual contexts ('case by case'), meaning taking into account all the characteristics of specific situations; (*iii*) in particular decisions resulting in a use of force against a target ('individual'), which excludes intervention only at the early stage of programming a LAWS.[690] 'Meaningful' can be understood as the opposite of 'absent', but also 'nominal':[691] it is a requirement stemming from the intuitive premise that human operators 'simply pressing a "fire" button … is not sufficient'.[692] It has been said that notwithstanding the inherently subjective notion of 'meaningful', the extent to which a form of 'human intervention' is required

[688] http://www.article36.org/statements/remarks-to-the-ccw-on-autonomous-weapons-systems-13-may-2014/, italics added.

[689] For an explanation of 'nominal' intervention in autonomous decision-making processes, see *supra* Chapter I.

[690] Article 36's position is better explained in Moyes, *Meaningful human control over individual attacks*, Speaker's summary, in ICRC Report 2016, cit., 46-52.

[691] For more on the scope and meaning of 'meaningful', see *amplius* Malgieri-Comandé, *Why a Right to Legibility*, cit., at 257 (explaining the term's 'polysemy' and defining it as 'significant, relevant, important, consequential, material, telling, pithy, weighty, valid, worthwhile, and purposeful'). According to the Authors, 'meaningful' can be understood both as 'understandable' and 'significant'. See Chengeta, *Defining the emerging notion*, cit., at 852-854 (explaining that, albeit 'deliberatively' present, humans 'can also be victims to errors of inductive reasoning, such as automation bias, assimilation bias, and confirmation bias). Interestingly, Chengeta considers human control as the flipside of the coin of autonomy. Drawing from the notion of autonomy that has been explained above (Chapter I), the more autonomous functions are given room the more MHC gets thinner. It follows that there may be a sort of 'gray zone' where human control seems to be preserved, but actually it is scarcely effective – in brief, it is only 'nominal'. On this point see *amplius* Sharkey, *Towards a principle for the human supervisory control of robot weapons*, 2 Politica & Società (2014), 305-324 (contending that 'levels' of supervisory control where programs selects target and human must approve before attack or veto in restricted time are both suitable to generate 'automation bias' and therefore are not acceptable).

[692] See Moyes, *Meaningful human control*, cit., at 46 (concluding that to say that some human control is necessary is not enough, as it 'must be in some way substantial').

has an implication on the *temporal* dimension of control: 'sufficient time' must be given to a human operator to intervene in the process.[693]

Other actors have taken a similar position on MHC. HRW, for example, has claimed that 'there should always be MHC of targeting and kill decisions in any individual attack on other humans',[694] embracing a narrow understanding of the concept and limiting its scope to human targets – which would exclude cases where targets are, say, military objects in armed conflict. The Campaign to Stop Killer Robots (CSKR) pointed at the 'importance of always maintaining MHC over targeting and attack decisions'.[695] The ICRC stressed the need for MHC when it comes to 'critical functions' of the weapon,[696] but seems less demanding in terms of control over individual attacks. Some States as well have supported a narrow understanding of MHC, such as Germany,[697] Ireland,[698] and the Holy See.[699]

In the same line, computer scientist Sharkey proposes a narrow-MHC when he argues that human agents (commanders or operators) must: (*i*) have full contextual and situational awareness of a specific attack; (*ii*) be able to perceive unexpected change in circumstances; (*iii*) retain the power

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[693] See UNIDIR, *How might Meaningful Human Control*, cit., at 3. In this perspective, see also O'Connell, *Banning Autonomous Killing: The Legal and Ethical Requirement That Humans Make Near-Time Lethal Decisions*, in Evangelista-Shue, *The American Way of Bombing. Changing Ethical and Legal Norms, From Flying Fortress to Drones*, Ithaca, 2014, at 224-235.

[694] https://www.unog.ch/80256EDD006B8954/(httpAssets)/6CF465B62841F177C1257CE8004F9E6B/$file/NGOHRW_LAWS_GenStatement_2014.pdf.

[695] https://www.unog.ch/80256EDD006B8954/(httpAssets)/33AFAF2B1AFFFB3CC1257CD7006AAB67/$file/NGO+Campaign+Killer+Robots+MX+LAWS.pdf.

[696] https://www.unog.ch/80256EDD006B8954/(httpAssets)/C99C06D328117A11C1257CD7005D8753/$file/ICRC_MX_LAWS_2014.pdf (and further inquiring 'whether 'the required level of human control [is] the same in all circumstances').

[697] https://www.unog.ch/80256EDD006B8954/(httpAssets)/9FB02F665072E11AC1257CD70066D830/$file/Germany+LAWS+2014.pdf ('there should be a common understanding in the international community that it is indispensable to maintain human control *over the decision* to kill another human being').

[698] https://www.unog.ch/80256EDD006B8954/(httpAssets)/52D60AFBBA85588FC1257CD700675837/$file/Ireland_MX_LAWS_2014.pdf (stressing the importance of maintaining 'human control over the use of force' as put forward by the ICRC).

[699] https://www.unog.ch/80256EDD006B8954/(httpAssets)/D51A968CB2A8D115C1257CD8002552F5/$file/Holy+See+MX+LAWS.pdf (arguing that MHC 'over such decisions [regarding life and death for other human beings] must always be present').

to suspend or abort the attack; (*iv*) have time for deliberation on the significance of the target.[700] Sharkey adds that also the scenario where a computer program provides a list of targets and leaves the human operator the choice of initiating an attack is acceptable only if the human deliberates about the target before attacking; and such deliberation, he argues, has to precede *any* attack.[701] Raising the bar even higher, Chengeta proposes an understanding of MHC that: (*i*) requires human judgment in real time over individual attacks; (*ii*) requires human authorization for each use of force; (*iii*) allows for equipping the machine with abort mechanism; (*iv*) include the obligation to monitor LAWS while executing the decision.[702]

This is not however the only understanding of MHC, as a more extensive interpretation (i.e. broad-MHC) is possible as well. For instance, US Directive 3000.09 requires 'appropriate levels of human judgment over the use of force'.[703] 'Appropriate' has replaced as a standard that of 'meaningful'; more concerning, however, is the fact that reference to 'individual attacks' has made the way for a more generic 'use of force'.[704] It follows that according to a broad understanding of MHC human deliberation may not be present at each and every use of lethal force against

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[700] https://www.unog.ch/80256EDD006B8954/(httpAssets)/78C4807FEE4C27E5C1257CD700611800/$file/Sharkey_MX_LAWS_technical_2014.pdf. An analogous position is taken by the ICRAC: see Frank Sauer's intervention on behalf of ICRAC at the 2014 MoE, quoted by Crootof, *A Meaningful Floor*, cit., at 56-57.

[701] Sharkey, *Staying in the loop: human supervisory control of weapons*, in Bhuta et al. (eds.), *Autonomous Weapons Systems*, cit., at 34 ff.. This approach is fully consistent with understandings of MHC as excluding merely 'nominal' human control.

[702] See Chengeta, *Defining the emerging notion*, cit., at 888-889 (acknowledging that 'maintaining MHC over weapon systems means retaining the control-dependent relationship between humans and weapon systems for their critical functions' and that as a result 'a properly and normatively construed definition of MHC is the equivalent to a ban on fully autonomous weapons').

[703] See US Directive 3000.09, cit., § 4.

[704] See also Saxon, *A human touch: autonomous weapons, DoD Directive 3000.09 and the interpretation of "appropriate levels of human judgment over the use of force"*, in Bhuta et al. (eds.), cit., at 201 (explaining that the notion of MHC is substantially rejected by the US on the basis that it does not fully capture the role humans play in developing and deploying LAWS).

an individual; a more general, *softer* form of involvement may suffice.[705] In this sense human control can be exercised through the design of a system and by ensuring its operational reliability and predictability: such control would be 'meaningful' inasmuch as human agents are tasked with *programming* the system.[706] A broad understanding of MHC would therefore require human presence 'over the weapon', without further specification and reference to individual attacks.[707] Some have explicitly rejected 'narrow' understandings of MHC on the ground that such approach would fail 'to acknowledge that humans, including supposed experts, are prone to a legion of errors'.[708] This is an interesting reflection, whose worth lies in that it focuses on a *cost-effective analysis*: having human operators 'in control' of a machine may lead to suboptimal outcomes, which in IHRL/IHL means nothing less than targeting the wrong person. Strong *consequentialist* arguments seem therefore to run against *deontological*, narrow concepts of MHC.[709]

To sum up, the concept of MHC has emerged in the debate on LAWS to catalyze consensus from a variety of governmental, intergovernmental, academic and policy actors. No one doubts that maintaining MHC is a key component of increasingly autonomous technology – however

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[705] For an early position on this, see Schmitt, *Autonomous Weapon Systems and International Humanitarian Law: A Reply to the Critics*, 1 Harvard National Security Journal Features (2013), 1-37, at 33 (envisaging LAWS where 'a human might not be in control of a particular engagement').

[706] See UNIDIR, *Considering How Meaningful Human Control*, cit., at 3.

[707] See for instance the Statement of Austria at the 2018 GGE: https://www.unog.ch/80256EDD006B8954/(httpAssets)/AA0367088499C566C1258278004D54CD/$file/2018_LAWSGeneralExchang_Austria.pdf.

[708] See Margulies, *Making autonomous weapons accountable: command responsibility for computer-guided lethal force in armed conflicts*, in Ohlin (ed.), *Research Handbook on Remote Warfare*, Cheltenham-Northampton, 2017, 405-442, at 435.

[709] On this particular point, see *amplius* Tamburrini, *On Banning Autonomous Weapons Systems: From Deontological to Wide Consequentialist Reasons*, in Bhuta et al. (eds.), *Autonomous Weapons Systems*, cit., at 122-141 (arguing that there is no real contrast between consequentialist and deontological arguments in normative ethics, as they converge in providing strong support for a pre-emptive ban on LAWS). See also Amoroso-Tamburrini, *The Ethical and Legal Case Against Autonomy in Weapons Systems*, 18 Global Jurist No. 1 (2018), 1-20.

understandings of the notion vary so much that an universally accepted notion of MHC does not exist yet. This is why focusing on MHC during the debate before the CCW has been perceived as counterproductive at times.[710]

4.3 MHC as a Tool for Assigning Responsibility

It is legitimate to argue that the fortune of a concept like MHC – and thus at least its basic purpose – lies in that it offers 'a way out of conceptual and political difficulties' thanks to its 'strategic ambiguity'.[711] In the current debate, however, the notion of MHC is employed to rule out autonomous killing by those who oppose LAWS, and has so far played a key role for promoting the adoption of a ban.

It is now time to focus on this variegated position, as an attentive appraisal of MHC shows that there actually are at least *two* different understandings of why it is important to maintain it in LAWS. The first – and so far the most supported – conceives MHC as the *conditio sine qua non* for accountability: should LAWS operate in a way that results in the violation of a norm of international law (IHL or IHRL), MHC would provide an efficient framework for assigning responsibility.

According to most commentators, MHC's major purpose in current debate is ensuring an acceptable assignation of responsibility. When it comes to autonomous killing, 'accountability gaps' are possibly the worst fears scaring international actors, scholars and civil society at large.[712] It is a

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[710] See for instance the Statement of France during the 2015 MoE: 'cette notion ne permet pas de répondre de manière adéquate aux exigences de caractérisation des SALA car elle est trop vague et pourrait conduire à englober dans le périmètre de nos discussions des systèmes qui ne répondent pas au critère d'autonomie que je viens d'énumérer', at https://www.unog.ch/80256EDD006B8954/(httpAssets)/D7D84A60ADAC158CC1257E26005E532F/$file/2015_LAWS_MX_France.pdf.

[711] See Anderson-Waxman, *Debating Autonomous Weapons Systems*, cit., at 1113.

[712] See Report Heyns, cit., §§ 75 ff. (outlining that LAWS's nature and 'the many levels likely to be involved in decisions about deployment result in a potential accountability gap or vacuum' and concluding that '[t]he question of legal responsibility could be an overriding issue'); Geneva Academy Briefing No. 8, cit., 21-25; HRW-IHRC, *Mind the Gap. The Lack of Accountability for Killer Robots*, 2015. For scholarship, reference can be made to: Chengeta,

justified fear, though: entrusting lethal decision to non-human (i.e. non-accountable) agents would mean an inevitable reduction in 'deterrence and prevention …, resulting in lower protection of civilians and potential victims of war crimes'.[713] In other words, '[i]f the nature of a weapon renders responsibility for its consequences impossible, its use should be considered unethical and unlawful as an abhorrent weapon'.[714] It is therefore fundamental to establish a clear framework for assigning responsibility,[715] should a particular use of LAWS result in a violation of pertinent norms.

The 'number 0' scenario would be holding LAWS themselves accountable for behavior resulting in a violation of IHRL/IHL. While some have underscored the logical benefits associated with attributing some 'legal personhood' to machines,[716] most reject the idea, as they

Accountability Gap: Autonomous Weapon Systems and Modes of Responsibility in International Law, 45 Denver Journal of International Law and Policy No. 1 (2016), 243-258; Crootof, *War Torts: Accountability for Autonomous Weapons*, 164 University of Pennsylvania Law Review No. 6 (2016), 1347-1402; Reitinger, *Algorithmic Choice and Superior Responsibility: Closing the Gap Between Liability and Lethal Autonomy by Defining the Line Between Actors and Tools*, 51 Gonzaga Law Review No. 1 (2015), 79-119; McFarland-McCormack, *Mind the Gap: Can Developers of Autonomous Weapons Systems be Liable for War Crimes?*, 90 International Law Studies (2014), 361-385; Beard, *Autonomous Weapons and Human Responsibilities*, 45 Georgetown Journal of International Law No. 3 (2014), 617-682. For a technological appraisal of the issue, see Matthias, *The Responsibility Gap: Ascribing Responsibility for the Actions of Learning Automata*, 6 Ethics and Information Technology No. 3 (2004), 177-183.

[713] See Report Heyns, cit., § 75.

[714] Ibidem, § 80. For a different view on the issue, see Schmitt-Thurner, *"Out of the Loop"*, cit., at 276 ('[g]iven that fully autonomous weapons represent a somewhat greater distancing of human operators from the battlefield, issues related to determining responsibility and assessing accountability for the activities of these systems are particularly acute').

[715] See Chengeta, *Defining the notion*, cit., 865 ff. (arguing that in order to employ MHC as a legal standard it is essential to relate it to a 'specific actor' which has to be held responsible).

[716] See for instance Michalczak, *Animals' Race Against the Machines*, in Kurki-Petrzykowski (eds.), *Legal Personhood: Animals, Artificial Intelligence and the Unborn*, Cham, 2017, 91-104, at 99-100 (discussing the strength of 'subjectivization' for autonomous weapons, namely its coherence with the theoretical framework of the autonomous agents' actions and its alleged elevated 'ethicality').

fundamentally lack moral agency.[717] However, it has been demonstrated that criminal law as is today can be applied to non-human agents as well.[718]

We will tackle three modes (or forms) of responsibility in turn: individual (4.3.1); corporate (4.3.2); state (4.3.3).[719] As has been correctly pointed out, these modes of responsibility are at no point mutually exclusive; rather, they are *complementary*.[720] Our approach will be to test each one of them in order to evaluate whether only narrow understandings of MHC are adequate in filling (possible) accountability gaps or also broader understandings may do.

4.3.1 Individual Responsibility

The idea of individual responsibility is well established in international law:[721] in addition to being a core principle of ICL,[722] both IHRL and IHL

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[717] To name only one, see Chengeta, *Accountability Gap*, cit., at 11 (affirming that 'no matter how machines' autonomy increases, they do not have moral agency'). This position can be fairly said to be almost universally accepted by actors involved in the discussions at the CCW *forum*, and possibly also outside.

[718] See Hallevy, *Liability for Crimes Involving Artificial Intelligence Systems*, Cham, 2015. The Author takes account of the unprecedented developments in A.I., and argues that as law has to adapt to societal changes nothing would obstacle holding machines criminally responsible for actions performed by them. In the Author's view, such result can only be averted by entirely rethinking the criminal legal system.

[719] That responsibility in international law is not a matter only for States, but can be extended to persons – be them natural (i.e. individuals) or legal (i.e. corporations) – is well established, and will not be discussed here beyond what is strictly necessary for the sake of the discourse. See for instance ICJ, *Case Concerning Application Of The Convention On The Prevention And Punishment Of The Crime Of Genocide (Bosnia And Herzegovina v. Serbia and Montenegro)*, Judgment, 26 February 2007, § 173, with references therein.

[720] See Chengeta, *Defining the notion*, cit., at 866 (rejecting 'split-responsibility' models and affirming that '[l]egally, each actor is responsible in their independent capacity').

[721] A disclaimer applies here. In the following we will take most notions and institutions (e.g. individual culpability, strict liability, international mechanisms for the punishment of international crimes, basic tenets of ICL, etc.) for granted, as devoting too much time to provide an historical and conceptual framework of them would not ultimately be helpful for our MHC-focused discussion. Detailed analysis will therefore be conducted only when strictly necessary to a better appraisal of how MHC may work in the field of responsibility.

[722] See *ex multis* Greppi, *The evolution of individual criminal responsibility under international law*, 81 International Review of the Red Cross No. 835, 531-553 (linking the importance of international criminal responsibility with the underlying *values* of the international legal order).

establish a duty to investigate violations and, in case, to prosecute perpetrators. These duties take a different shape dependent on the particular violation's factual criteria: as for IHRL, there allegedly is a duty to investigate only gross violations constituting crimes under international law, while minor violations that do not qualify as such would be excluded;[723] a similar debate exists with respect to violations occurred within armed conflict and those occurred in law-enforcement operations, IHL being less demanding than IHRL.[724]

Discussing individual responsibility for violations committed through LAWS requires some preliminary clarifications. First, the nature of responsibility that we will consider is essentially *criminal* as the material conduct consists typically in offences to major goods of human life (such as personal integrity).[725] Second, and stemming from the principle that each agent must respond in their independent capacity, it is necessary to distinguish between different agents that may take part in violations committed through LAWS – namely producers, operators and commanders. Their criminal responsibility will therefore be ascertained having regard to their contribution and their mental participation.

Assigning individual responsibility is not always problematic. For instance, consider the case where LAWS are programmed in a way that does not allow for distinguishing permissible targets (e.g. LAWS capable of 'shooting on sight' only) and are deployed in an operational scenario resulting in the death of a number of individuals. Criminal law, both

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[723] See *amplius* 2005 *Basic Principles and Guidelines on the Right to a Remedy and Reparation for Victims of Gross Violations of International Human Rights Law and Serious Violations of International Humanitarian Law*, Art. 4.

[724] On the relationship between the duty to investigate under IHL and under IHRL, see above Chapters II and III. Generally, see Gaggioli, *A legal approach to investigations of arbitrary deprivations of life in armed conflicts: The need for a dynamic understanding of the interplay between IHL and HRL*, 36 QIL Zoom-In (2017), 27-51.

[725] Obviously individuals can also be held responsible from a civil perspective, i.e. for restoring injuries derived from their wrongful conduct. However, it is accepted that IHRL imposes a duty on States to criminalize conduct violating the right to life, especially when wantonly; see *amplius supra*, Chapter III.

domestic and international,[726] applies to all the agents that have been involved in the commission of the crime (manufacturers; producers; military commander or any public officials responsible for the deployment). The usual requirements for criminal liability must therefore be present, i.e. causal link, *actus reus* and *mens rea*; with regard to the latter, the 'willful action requirement' is generally believed to embrace direct intent and recklessness.[727] The role that MHC can play with regard to this scenario must not be overestimated. Issues such as causal link and culpability are easily solved when human agents exert MHC over individual attacks: the scenario is not different from a targeted killing performed by a drone strike.

On closer inspection, however, broader understandings of MHC lead to the same result: if the human agent knows that violations of international law will result from operating LAWS in a given context, and then s/he is disinterested in their actual behavior, both causal link and *mens rea* will easily attach. As has been said, these are 'easy cases',[728] in which '[t]he mere fact that a human might not be in control of a particular engagement does not mean that no human is responsible for the actions' of LAWS.[729] In other

[726] For instance, an individual that intentionally programmed a LAWS to commit a serious violation of IHL can be prosecuted for war crimes as regulated by domestic systems as well as international systems – e.g. under Art. 8 of the ICC Statute.

[727] As far as international law is concerned, ICL has so far developed a sound elaboration of these requirements, which could not be analyzed in full here. Suffice it to say that the ICC Statute requires that individuals may be held responsible 'only if *material elements* are committed with *intent and knowledge*' (italics added). The requirement of culpability is required by the general principle according to which no one ought to be punished except for their own fault (*nullum crimen sine culpa*). 'Recklessness' is something different from direct intent, as it applies when agents act without being certain of a particular result but accepting the possibility of its happening in the ordinary course of events. On this point see more extensively ICTY, *Prosecutor v. Delalić*, No. IT-96-21-T, judgment, 16 November 1998, §§ 437-439.

[728] See Crootof, *War Torts*, cit., at 1377 (considering the examples of willful programming of LAWS to commit serious violations of IHL and of a commander ordering the commission of IHL violations through LAWS or failing to prevent the commission of such violations in spite of being aware of such impermissible use of LAWS).

[729] See Schmitt-Thurner, *"Out of the Loop"*, cit., at 277-278 (rejecting the argument made by HRW and making the example of operators willfully employing LAWS incapable of complying with IHL and of a commander failing to prevent a violation). Generally those who support LAWS are confident that no accountability gaps will result from their

words, narrow-MHC does not stand as a structural requirement for ensuring (domestic and/or international) criminal responsibility in these cases.

'Harder cases',[730] instead, would be those where a violation of IHL or IHRL occurs without intentionality or recklessness on the part of the human agent (i.e. the developer or the operator): no one either wanted a LAWS to commit crimes or foresaw it, *nonetheless* the material act resulting in a violation has occurred.[731] Issues generated by such scenario have been tackled from different standpoints, in order to 'fill' any perceived accountability gap raising therefrom. Two ways out of the quagmire have been proposed. On the one hand, it is argued that domestic law remains fully applicable to *negligent* conduct resulting in unlawful deaths:[732] while ICL does not regularly recognize a criminal negligence standard,[733] it seems at best far-fetched to argue that no responsibility can be assigned in this

development and deployment, as existing law is perfectly suitable for assigning responsibility in cases analogous to those under our consideration.

[730] Such division has been drawn by Crotoof, *War Torts*, cit., at 1377 ff..

[731] With respect to the 'developers', compare McFarland-McCormack, *Mind the Gap*, cit., at 384 ('[a] sophisticated autonomous weapons system will not be developed by a single individual, but by many teams of developers in many organizations working on a multitude of subsystems with complex interdependencies. Attempting to identify an individual most responsible for subsequent behavior of a deployed weapons system that constitutes a war crime may simply be too difficult for the purposes of initiating trial proceedings') with Schmitt-Thurner, *"Out of the Loop"*, cit., at 278-279 (excluding that 'individuals who design autonomous weapon systems might be at risk of being held accountable for war crimes committed with those systems' if the system is not specifically designed to commit a war crime').

[732] Civil law systems and common law systems notoriously have a different understanding of negligence, but both tend to distinguish between a 'gross' or 'culpable' negligence (i.e. where the individual foresee possible consequences of his conduct but believes they will not occur in the ordinary course of events, a mental state which resembles the Italian 'colpa cosciente'), and 'simple' or 'inadvertent' negligence (i.e. where the individual is not aware of the possible consequences of his conduct, conversely resembling the Italian 'colpa incosciente'). On this point see *amplius* Gargani, *Negligence*, in Cassese (ed.), *The Oxford Companion to International Criminal Justice*, Oxford, 2009, at 433 and *passim*.

[733] For a case recognizing the mental element of negligence as sufficient to qualify as *mens rea* for a war crime, see Cassese et al. (eds.), *Cassese's International Criminal Law*[3], Oxford, 2013, at 54 (citing a 1921 case where the Leipzig Supreme Court found a captain guilty of causing death through culpable negligence).

case.[734] Rather, it would be more useful to inquiry whether negligent conduct attaches *at all* in case of unpredictable actions carried out by LAWS (in particular employing self-learning algorithms). Putting all the blame on human operators without ascertaining their culpability would run against the very essence of the principle of culpability as the cornerstone of individual responsibility – it would be equal to imposing a *strict* liability regime, patently at odds with contemporary criminal law.[735] The same holds true for criminal responsibility of those who take part in designing, developing and programming LAWS at large.[736]

On the other hand, with a view to conciliating negligence and ICL some have argued that the model of 'command responsibility' can be re-thought and applied to such scenarios. 'Command responsibility' is a form of indirect liability, well recognized in treaty and customary ICL,[737] which applies when: (*i*) there is a superior-subordinate relationship between the direct perpetrator (i.e. the subordinate) and the indirect perpetrator (i.e. the superior); (*ii*) the superior knew or had reason to know about the crime committed or to be committed; (*iii*) the superior failed to take reasonable

[734] For this reason the position expressed by some scholars needs to be contextualized and possibly reviewed. For instance, Crootof correctly claims that a negligence standard does not fit with ICL's features, but fails to acknowledge that in these cases domestic law applies; see Crootof, *War Torts*, at 1381 ff..

[735] In this sense, see also Beard, *Autonomous Weapons and Human Responsibilities*, cit., at 654 (finding that criminal-law response may be inappropriate for those who deploy LAWS for lack of actual *mens rea*).

[736] *Ibidem*, at 651 (underscoring that '[d]ecision-making by [LAWS] will probably be distributed across several programs and processors' and that '[t]he environment in which autonomous weapons are placed, the missions that they are assigned, and the context in which they are used may also make it inappropriate to attribute responsibility to designers, engineers, and programmers who cannot limit the potential uses or harms that these weapons cause').

[737] See generally ICTY, *Delacić*, cit., §§ 330-343; on command responsibility with respect to LAWS, see Chengeta, *Accountability Gap*, cit., 27 ff.. Again, a disclaimer: our discourse will be mostly IHL-centered as the doctrine of command responsibility has been developed with respect to that branch of law. IHRL actually recognizes analogous rules, which *mutatis mutandis* mirror those existing under IHL: see, for instance, UN Basic Principle No. 24 ('[g]overnments and law enforcement agencies shall ensure that superior officers are held responsible if they know, or should have known, that law enforcement officials under their command are resorting, or have resorted, to the unlawful use of force and firearms, and they did not take all measures in their power to prevent, suppress or report such use').

measures to prevent the crime or to punish the subordinate.[738] Whether command responsibility can be extended so as to cover the relationship between the human agent that deploys a LAWS (i.e. the 'superior') and the LAWS itself (i.e. the 'subordinate') is debated.

It has been argued that 'command responsibility' would not fit the case of human agent-LAWS relationship for several reasons.[739] *First*, 'command responsibility' presumes the subordinate's capability of committing a chargeable offense – a capability LAWS are commonly believed to lack.[740] *Second*, the *mens rea* element of command responsibility – at least according to some embracing negligence –[741] still is problematic in the case of LAWS. According to this doctrine either 'actual knowledge' or 'potential knowledge' of the commission of a crime is required; the latter has been interpreted in the sense that commanders must possess 'alarming information' about the (possible) criminal action of the subordinate.[742] In the case of a LAWS ensuring sufficient and adequate standard of reliability it would be extremely hard to meet the requirement of 'alarming information', the resulting risk being a veiled acceptance of strict liability.[743]

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[738] This criteria have been famously outlined by ICTY, *Delalić*, cit., § 346. For a general overview of the doctrine of 'command responsibility', see Bonafé, *Command Responsibility*, in Cassese (ed.), *The Oxford Companion*, cit., 270-272.

[739] See generally Chengeta, *Accountability Gap*, cit., 31 ff..

[740] See Crotoof, *War Torts*, at 1379; see also Chengeta, *Defining the notion*, cit., particularly at 879-880 (recalling that LAWS 'must be considered as weapons' as 'subordinates' for the purposes of command responsibility are only those who 'are capable of being subjected to prosecution and punishment' – something which LAWS are not as they have 'no moral agency').

[741] According to ICL case-law, 'gross' negligence applies to command responsibility. *Contra* see Bonafè, *Command Responsibility*, cit., at 271 (arguing that 'negligence is not a basis of liability in the context of command responsibility').

[742] See ICTY, *Delacić*, cit., § 383; see more in detail ICTY, *Prosecutor v. Krnojelac*, No. IT-97-25-A, Appeal judgment, 17 September 2003, § 155, and *Prosecutor v. Strugar*, No. IT-01-42-T, Tribunal judgment, 31 January 2005, § 369 (explicitly rejecting the existence of a general 'duty to know' incumbent upon the commander). This means that 'the assessment of the commander's mens rea depends on the specific circumstances of each case, and cannot be inferred merely from the general context surrounding the commission of international crimes', see Bonafè, *Command Responsibility*, cit., at 271.

[743] See Crotoof, *War Torts*, at 1381 (claiming that '[a]side from its innate capacity for unpredictable action, however, it is unclear what would constitute sufficiently alarming information to constitute notice of a risk for autonomous weapon systems').

The inadequacy of both negligence and command responsibility has thus led some commentators to resort to narrow-MHC as a way out of this legal quandary. In their view, maintaining such form of MHC would ensure that no accountability gaps generate from the use of LAWS.[744] However, this may not be the only criminal-law oriented solution: it has been argued that narrow-MHC can be renounced, on condition that an anti-originalist, negligence-based account of command responsibility is accepted.[745] In particular, human agents operating LAWS would be accountable under command responsibility if they fail to exercise what has been called 'dynamic diligence' on LAWS: requiring MHC over each attack would thus be unnecessary, provided that operators can interface properly with the machine (e.g. to override or abort LAWS's decision), review periodically their functioning and understanding courses of action.[746] In short, broad understandings of MHC would be not only acceptable, but even preferable, as they would neither undermine accountability nor 'stifle innovation'.

In sum, the role of narrow-MHC in assigning individual responsibility is still at the center of the debate, and universally accepted

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[744] An interesting position on the issue is taken by Chengeta, *Defining the notion*, cit., 882-883 and *passim*, who employs the notion of 'effective control' as required for the purposes of 'command responsibility' (see ICTY, *Delacić*, cit., § 197: *de jure* control alone is not sufficient, a stronger *de facto* control is actually required) to draw an analogy with MHC. In his view, as effective control needs to be 'real control in real time', by the same token 'MHC … must be real, not "theoretical or potential"'. See also id., Accountability Gap, cit., at 34 ('the idea of control over the weapon one uses is central to their responsibility. For it to be meaningful control, programming alone is not sufficient. *There is a need for some form of supervision after activation. Such supervision must be in real time*', italics added).

[745] Reference here is made to Margulies, *Making Autonomous Weapons Accountable*, cit., *passim*; the author argues that command responsibility, yet 'admittedly not a perfect fit for filling the [LAWS] accountability gap', only would need a 'modest revision' to be suitable for application to LAWS, a normative extension that 'is a logical outgrowth of an evolution in the conduct of hostilities, in which more warfighting is done autonomously').

[746] Ibidem, *passim*. Margulies relies on the concepts of 'dynamic diligence' (mandating interface enabling humans to step in the algorithmic process of targeting) 'dynamic assessment' (requiring periodical review of the algorithmic processes) and 'dynamic parameters' (allowing for legibility of the processes) to demonstrate that narrow-MHC is not essential if the ultimate goal is accountability. Its threefold notion would work as 'a variation on the theme of "human on the loop" suggested by some commentators' and 'a practical version of what [MHC] would look like, if that phrase were deployed to permit autonomy while preserving checks on autonomy's excesses'.

solutions do not seem on the horizon. At this point, it should be asked whether such approach does not accentuate criminal law's role far *beyond* its capabilities. Some have already questioned whether criminal-law oriented, narrow understandings of MHC are 'adequate to establish [a] relationship between autonomy and accountability'.[747] It is therefore argued that placing excessive emphasis on this mode of responsibility risks obliterating that there may be *other* modes suitable to addressing the issue of LAWS in an equally – if not even *more* – satisfying manner.

4.3.2 Corporate Responsibility

A different, possibly innovative approach to establishing accountability for violations of IHRL and IHL would be to make corporations involved in designing, developing and eventually distributing LAWS liable.[748] Holding a legal person responsible is something different from holding a natural person responsible; however the two modes of responsibility are not mutually exclusive, so they can easily co-exist (and regularly do).[749] In the case of LAWS, it has been already explained that establishing criminal responsibility for operators or commanders is not unproblematic – the same holds true *a fortiori* when it comes to individual designers or manufacturers.[750]

Legal persons involved in the development of LAWS can be held responsible – either under criminal law or under civil law, depending on the domestic system under consideration. In international law there is a

[747] See Crootof, *War Torts*, cit., at 1380, ftn. 180 (quoting the position of India).
[748] As has been suggested in Geneva Academy Briefing No. 8, cit., at 22.
[749] In this sense, see Chengeta, *Accountability Gap*, cit., at 36.
[750] See more extensively McFarland-McCormack, *Mind the Gap*, cit., *passim* and particularly 381 ff.. Briefly, the author outlines elements that seemingly generate accountability gaps in assigning individual responsibility for 'war crimes': first, LAWS will be presumably developed by 'teams of developers … working on a multitude of subsystems with complex interdependencies' (at 384); second, existing ICL's *mens rea* requirements are inadequate to cope with the unprecedented situation of autonomous killing, so the criminal-law concept of 'aiding and abetting' will require clarification if not a new appraisal. See also Schmitt, *Autonomous Weapons Systems*, cit., at 33 (considering the 'easy' case of willful programming of LAWS so that they commit war crimes or analogous violations).

growing trend towards the acceptance of corporations as being entitled with a set of *duties* (in addition to rights), namely to 'respect' IHRL and IHL.[751] As for the time of the writing, no legally binding instrument of international law regulates the issue of corporate responsibility for failure to comply with such duties, although intense negotiations have been taking place at the UN for several years.[752] Be as it may, today domestic legal orders remain the appropriate forum for victims to seek redress; the case of LAWS raises issue that are only in part new to current debates on the topic.[753]

To begin with, it is important to consider briefly current challenges to corporate responsibility when it comes to LAWS. Corporations have a duty to abstain from violating human rights (i.e. a *negative* obligation) as well as taking positive steps, such as preventing or mitigating negative impacts their activity may have on human rights (i.e. a *positive* obligation), 'even if they have not contributed to those impacts'.[754] Similar provisions

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[751] See *UN Guiding Principles on Business and Human Rights: Implementing the United Nations 'Protect, Respect and Remedy' Framework* (hereinafter: UN Guiding Principles), 2011, § 11 ('Business enterprises should respect human rights. This means that they should avoid infringing on the human rights of others and should address adverse human rights impacts with which they are involved'). For a general overview on corporations and IHL, see Batesmith, *Corporate criminal responsibility for war crimes and other violations of international humanitarian law: the impact of the business and human rights movement*, in Harvey et al. (eds.), *Contemporary Challenges to the Laws of War. Essays in Honour of Professor Peter Rowe*, Cambridge, 2014, 285-312; for corporations and IHRL, see more extensively Bonfanti, *Imprese multinazionali, diritti umani e ambiente. Profili di diritto internazionale pubblico e privato*, Milan, 2012.

[752] An open-ended intergovernmental working group with the mandate to elaborate an international legally binding instrument on Transnational Corporations and Other Business Enterprises with respect to human rights was established in 2014 by a resolution of the UN Human Rights Council. After three sessions a so-called 'Zero Draft' was presented in July 2018.

[753] For instance, the issue of extraterritorial jurisdiction is far from being peculiar to LAWS as it generally embraces the phenomenon of selling whatsoever weapons abroad. See *amplius* Steinhardt, *Weapons and the Human Rights Responsibilities of Multinational Corporations*, in Casey-Maslen (ed.), *Weapons Under International Human Rights Law*, cit., 507-541. In the sense that LAWS inasmuch as specific technological application in robotics may pose new challenges to product liability, see Chengeta, *Accountability Gap*, cit., at 39 (recognizing that 'for victims of [LAWS], launching a successful civil lawsuit will be an uphill task unless where it is clear that the corporation operated with *mala fides*').

[754] See for instance the UN Guiding Principles, cit., § 13(b) (with Commentary specifying that such duties apply to all 'business relationships', including 'with… State entity directly

exist with respect to IHL;[755] more generally, the phenomenon of business enterprises involved in the designing, manufacturing and selling of weapons raises uncontroversial concerns.[756] Applying all this to the case of a corporation that has signed a contract with a state body (e.g. a Department of Defense), it follows that logically it is in the corporation's best interest to produce IHRL/IHL-compliant LAWS, as rules on product liability as established by domestic legal systems will apply.[757]

Holding a corporation accountable is admittedly like pulling teeth, as victims seeking redress need to face an handful of obstacles – obstacles that are particularly insidious in the case of LAWS. *First*, developers are rarely held responsible also for design defects, thus *a fortiori* unanticipated behavior of LAWS independent of poor design will hardly lead to adequate redress: this holds particularly true when corporations notify the purchaser that wrong targets may be attacked.[758] *Second*, jurisdictional issues are much likely to arise,[759] as a typical operational field for LAWS will be extraterritorial areas of armed conflict or – in an analogy with current

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linked to its business operations, products or services'). The case of a private company producing and selling LAWS to a state Department is therefore covered by the provision.

[755] See ICRC, *Business and International Humanitarian Law. An Introduction To The Rights And Obligations Of Business Enterprises Under International Humanitarian Law* , Geneva, 2006, particularly at 25 (for obligations concerning the manufacture and trade of weapons) and 26 (for liability).

[756] In this sense, see more in detail Steinhardt, *Weapons and the human rights responsibilities of multinational corporations*, in Casey-Maslen, *Weapons Under International Human Rights Law*, cit., 507-541 (with a general focus on international law sources and a narrower one on the US legal system).

[757] See Krishnan, *Killer Robots: Legality and Ethicality of Autonomous Weapons*, Abingdon, 2009, at 103-104.

[758] On this point, see Beard, *Autonomous Weapons and Human Responsibilities*, cit., at 647 ff. (expressing doubts about civil lawsuits as an option for incentivizing corporations to produce more reliable LAWS).

[759] For a focus on the US legal system, reference can be made to Cassel, *Suing Americans for Human Rights Torts Overseas: the Supreme Court Leaves the Door Open*, 89 Notre Dame Law Review No. 4 (2014), 1773-1812 (commenting recent case-law regarding the Alien Tort Statute, which allows federal courts to hear tort suits against American nationals – and therefore American corporations – for human rights violations committed against foreign victims in foreign countries).

practice of drone strikes – 'outside areas of active hostilities'.[760] A solution that has been proposed with regard to such issues is that a form of strict liability must be imposed upon corporations involved in the design, manufacture and sell of LAWS;[761] according to others such mode of responsibility would not ensure necessarily higher compliance and reduced risks, but only producing the imposition of higher prices on LAWS 'to offset the liability risks, thus passing their increased liability costs on to the state consumers'.[762]

What has been said so far helps understand which role MHC actually plays in assigning responsibility to corporations involved in developing LAWS. If a violation of IHRL/IHL occurs as the result of operating a LAWS, domestic (and international) law regulating responsibility applies. It is up to these legal systems to establish which kind of responsibility must attach after weighing advantages against backdrops.[763] If the unintended outcome of LAWS' action was found to be imputable to a flaw in the design or

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[760] This expression is taken from the 2013 US President's *Procedures for Approving Direct Action Against Terrorist Targets Located Outside the United States and Area of Active Hostilities*, available at: https://www.aclu.org/foia-document/presidential-policy-guidance?redirect=node/58033.

[761] See HRW, *Losing Humanity*, cit., at 43-44. The rationale behind the option for strict liability is that it does not depend on negligence, a problematic culpable state when it comes to LAWS. Translating this in economic terms, under strict liability the cost of faultless accidents fall on injurers, while according to the negligence model they fall on the injured, who also have a heavier burden of proof. See *amplius* Crootof, *War Torts*, cit., particularly at 1387 (contrasting various theories of tort law – economic analysis *à la* Calabresi and corrective justice theories).

[762] Quoting Hammond, *Autonomous Weapons and the Problem of State Accountability*, cit., at 666 (concluding his reasoning by implying that in such case only State with large defense budget will afford LAWS, which will result in incremented asymmetry between Super-powers and other States).

[763] Admittedly domestic law may add further complications. For instance, in some legal systems (e.g. the US) the Government and its private contractors enjoy wide immunity from civil lawsuits: see Geneva Academy Brief No. 8, at 22 (recalling that 'some jurisdictions do not allow claims that relate to military activities, or selected public functions that raise wider questions of public policy'). For more on immunity and governmental activities as a *de facto* barrier for corporate accountability, see *amplius* Ausness, *Surrogate Immunity: The Government Contract Defense and Products Liability*, 47 Ohio State Law Journal (1986), 985-1035 (focusing on defective design approved by the US federal government and considering inter alia cases where the contractors had informed government officials of risks associated with the required design).

manufacturing of the weapon, a *negligent* form of responsibility may easily attach; on the contrary, should the same outcome be the result of an unforeseeable (mal-)functioning of the machine (quite plausible indeed, especially when self-learning algorithms are employed), *strict* liability would seem more appropriate. In both cases the notion of MHC does not appear decisive for the purposes of filling accountability gaps. Actually, the impression is that corporations' duties under IHRL and IHL do not require more than a broad-MHC: taking substantive obligations under these branches of law into account when designing and developing LAWS implies, *inter alia*, that programs are elaborated that are capable of adequately distinguishing permissible targets, or that allow for aborting ongoing missions by human operators.

In sum, our analysis of corporate responsibility through the lens of MHC has led to conclusions that resemble those under individual responsibility. Requiring human agents to be actively in the loop – in other words, understanding MHC as a narrow concept – is not necessary for assigning responsibility; other criteria, if adequately developed, may do. Instead, our reflection on strict liability has pointed to another actor whose responsibility may be usefully invoked: the State deploying LAWS.

4.3.3 State Responsibility

The inadequacy of individual responsibility, coupled with difficulties associated with launching lawsuit against corporations, have led some commentators to zoom in on state responsibility.[764] To the writer's best knowledge, it is the least explored mode of responsibility – but possibly the most promising.

The option of state responsibility is desirable for at least three reasons: *first*, it is not exclusive, so it can easily co-exist with other forms of responsibility as explained above; *second*, it may offer victims greater

[764] As suggested by Heyns' Report, cit., § 81 ('[i]n general, a stronger emphasis on State as opposed to individual responsibility may be called for'). See also McFarland-McCormack, *Mind the Gap*, cit., at 385 (lamenting lack of focused scholarship).

chances for adequate redress, considered that States have 'deep pockets';[765] *third*, its structure fits perfectly with 'objective' forms of responsibility. More generally, as States will be the primary users of LAWS, this form of responsibility has the potential for pushing States towards making sure that the weapons they get developed and then used comply with IHRL and IHL.[766] In other words, all the costs of such violations will be *internalized* by the State.

As is known, international law of state responsibility has been codified by the Draft Articles on Responsibility of States for Internationally Wrongful Acts, elaborated by the ILC and adopted in 2001 (hereinafter: ARS).[767] State responsibility stems from the commission of an 'internationally wrongful act' that: (*i*) is attributable to a State (i.e. *subjective* element); (*ii*) constitutes a breach of an international obligation of the State

[765] See Crotoof, *War Torts*, cit., at 1390.

[766] See Hammond, *Autonomous Weapons and the Problem of State Accountability*, cit., at 669 ('[s]hould states choose to use AWSs in spite of these risks, liability would give them a reason at the purchase and deployment stages to ensure that their AWSs will comply with international law').

[767] See *Responsibility of States for Internationally Wrongful Acts with Commentaries*, 2 Yearbook of the International Law Commission (2001), 26 ff., UN Doc. A/CN.4/SER.A/2001/Add.1. The UNGA has commended the ARS on a number of occasions; see for instance Res. 68/104, A/RES/68/104, 16 December 2013. As for the correspondence of ARS to customary law, the ICJ has importantly declared that at least some parts of the ARS are expressive of it; see ICJ, *Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Bosnia and Herzegovina v. Serbia and Montenegro)*, judgment, 26 February 2007, Rep 43, 138, at §§ 385, 388 (for the notion of 'state organ'), 398 (for the rule on conduct directed or controlled by a State), 420 (for the rule on 'complicity'), 462 (on the rule on reparations). This general rule has been restated also in specific branches of international law: as far as IHL is concerned, see Henckaerts&Doswald-Beck, *Customary International Humanitarian Law*, cit., Rule 149 ('[a] State is responsible for violations of international humanitarian law attributable to it, including: (a) violations committed by its organs, including its armed forces; (b) violations committed by persons or entities it empowered to exercise elements of governmental authority; (c) violations committed by persons or groups acting in fact on its instructions, or under its direction or control; and (d) violations committed by private persons or groups which it acknowledges and adopts as its own conduct'). For classic literature on state responsibility, see Crawford, *State Responsibility. The General Part*, Cambridge, 2013; Anzilotti, *Teoria generale della responsabilità dello Stato nel diritto internazionale*, Firenze, 1902.

(i.e. *objective* element);[768] the ARS do not take faultiness (*iii*) into (direct) consideration.[769] We will address these three elements in turn.

4.3.3.1 The 'Subjective' Element

Attributing a violation of IHRL/IHL to a State that has deployed LAWS does not seem problematic, as such deployment will logically be ordered by a human agent (i.e. a police officer; a military commander) constituting an *organ* of the State for the purposes of international responsibility,[770] and art. 4 ARS establish that conduct of State organs is considered 'an act of that State'. A problem may arise, however, if the following scenario is considered: LAWS lacking MHC over individual attacks can select and engage their targets without intervention by the human agent. But if the latter is a State organ in the meaning we described above, it follows that a particular targeting decision amounting to a violation of IHRL/IHL would not be attributable as such to the deploying State. In other words, one should distinguish between *two* conducts: on the one hand, that consisting in deploying LAWS; on the other hand, that consisting in selecting and engaging an unlawful target. Only the first would be attributable to the State.

This conclusion, however, can be easily rejected on the basis of a twofold systemic argument. *First*, the fact that the particular applier of the force is different from the state organ does not exclude imputation: the ARS attribute conduct in a broad number of cases where the material action is not taken by state organs.[771] *Second*, also giving relevance to the

[768] See art. 2 ARS.

[769] See ARS, cit., at 36, § 10, which specifies that requirement of a mental element is a matter for primary obligations, therefore excluded from the ARS (as it deals mainly with secondary obligations).

[770] For the interplay between international law and domestic law in defining 'organs', see ARS, cit., at 39, § 6 (making the example of police as an organ performing public functions irrespective of their domestic qualification as 'autonomous and independent of the executive government').

[771] Reference can be easily made to Arts. 5 (for persons or entities which are not organs but are empowered by the State to exercise governmental authority), 6 (for another State's

circumstance than the particular application of lethal force could not be foreseen by the State organ – we may say, that it was an *ultra vires* action – attribution attaches.[772] It follows that also those who consider LAWS more akin to 'combatants' rather than 'weapons', and therefore are more willing to recognize them agency to some extent,[773] will not be able to contrast the attribution requirement under state responsibility.

Another issue having a bearing on attribution is represented by an oft-quoted scenario, where LAWS are 'hacked' and employed by non-state groups.[774] The usual criteria of attribution apply, and it could not be otherwise.[775] With respect to this scenario, it must be added that States are under the obligation to do everything feasible to avoid that their weapons 'fall in the wrong hands'; more precisely, it is an obligation of due diligence.[776] As this is a profile that systematically finds its place within the perimeter of primary obligations, we will not address it here.

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organs put at the disposal of the State), and 8 (for persons or groups acting on the instructions of, or under the direction or control of, the State).

[772] In this sense, see Art. 7 ARS (regulating 'excess of authority or contravention of instructions').

[773] For an analogy between LAWS and combatants, see *amplius* Crotoof, *Autonomous Weapon Systems and The Limits of Analogy*, 9 Harvard National Security Journal (2018), 52-83. The Author argues that in the current discourse LAWS are often associated both with combatants (thus overemphasizing their capacity for independent and self-determined action) and weapons (thus minimizing it), and adds that analogy with animals and children is equally possible. In her view, however, these analogy may be useful only for describing how LAWS work, but eventually are of little to no help for regulating them. An author that has shown a progressive attitude towards recognizing robots some agency is Hallevy, *Liability for Crimes*, cit. (drawing analogies with human beings and corporations).

[774] See for instance Schmitt-Thurner, *"Out of the Loop"*, cit., at 242. See also the scenario envisaged by Leveringhaus-Giacca, *Robo-Wars. The Regulation of Robotic Weapons*, Oxford Martin Policy Paper, 2014, at 19 ('compared to existing weapons systems, autonomous systems may be more vulnerable to hacking, spoofing and reprogramming by enemy forces … if loss of control due to enemy action is hard to prevent, the risk of deploying autonomous robotic weapons may be too great to be ethically justifiable. this would especially be the case if enemies were to re-programme robotic weapons in order to commit war crimes, or to attack those who originally deployed them').

[775] See ARS, cit., Art. 8.

[776] For an overall account of the problem, see Pisillo Mazzeschi, *"Due Diligence" e responsabilità internazionale degli Stati*, Milan, 1989; more specifically on IHL, see Sassoli, *State responsibility for violations of international humanitarian law*, 84 IRRC No. 846 (2002), 401-434, at 411-412 ('the obligation to "ensure respect" laid down in Article 1 common to the

Recapitulating, it seems that LAWS, also lacking MHC over individual attacks, are not incompatible as such with the secondary norms of international law: they do not jeopardize the traditional and well-established rules for attribution of the internationally wrongful act.

4.3.3.2 The 'Objective' Element; In Particular, The Plea Of Force Majeure.

Moving on to the 'objective' element, state responsibility attaches if the conduct attributable to the State constitutes a breach of an international obligation incumbent upon that State.[777] Obviously, in order to assess the objective element reference must be made to the *primary* rules concerned: in the case of LAWS under our consideration, reference is made to obligations established by IHRL and IHL as explained previously.[778]

What is more interesting to focus on here is the possible application of circumstances precluding wrongfulness in the context of LAWS. Regulated by Chapter V, Part II, ARS,[779] they are discrete circumstances whose occurrence in a given case justifies or excuses State conduct.[780] In particular, it has been argued that as a result of increasing autonomous capabilities in targeting 'States may be tempted to plead *force majeure* in order to evade international responsibility for an armed robot's unforeseen

Conventions could also be seen as establishing a standard of due diligence with regard to private players if the latter find themselves under the jurisdiction of a State, or even with regard to breaches of international humanitarian law by States and non-State actors abroad which could be influenced by a State').

[777] See ARS, cit., at 35, §§ 7-8, and at 56 ff..

[778] For more on the distinction between primary and secondary rules, see Crawford, *State Responsibility*, cit., at 63-66.

[779] See ARS, cit., at 71 ff..

[780] For a general appraisal of circumstances precluding wrongfulness in scholarship, see Crawford, *State Responsibility*, cit., 274-322; Szurek, *The Notion of Circumstances Precluding Wrongfulness*, in Crawford et al. (eds.), *The Law of International Responsibility*, Cambridge, 2010, 427-438; Christakis, *Les "circonstances excluant l'illicéité": une illusion optique?*, in Corten et al. (eds), *Droit du pouvoir, pouvoir du droit: Mélanges offerts à Jean Salmon*, Bruxelles, 2007, 223-270; Ago, *Eighth Report on State Responsibility*, 2 ILC Yearbook No. 1 (1979), 27 ff.; for a recent and thorough contribution, see Paddeu, *Justification and Excuse in International Law. Concept and Theory of General Defences*, Cambridge, 2018.

"decision"'.[781] Such eventuality – yet remained marginal in the debate –[782] deserves attention, as it may have an influence on how to understand MHC.

As codified by Art. 23 ARS, *force majeure* consists in 'an irresistible force or … an unforeseen event, beyond the control of the State, making it materially impossible in the circumstances to perform the obligation'. The defense of *force majeure* relies on the general principle in accordance with which *ad impossibilia nemo tenetur*: actually deriving from Roman Law, this principle is today recognized by basically all legal systems of the world.[783] *Force majeure* has undergone a long process of conceptual rethinking during the last two centuries, resulting in the current formulation under ARS (understood in the light of a 'situation-based' approach).[784] It traditionally covers both natural and man-made events:[785] as a malfunctioning of LAWS

[781] Quoting from Melzer, *Human rights implications of the usage of drones and unmanned robots in warfare*, European Parliament Directorate-General for External Policies, 2013, available at http://www.europarl.europa.eu/RegData/etudes/etudes/join/2013/410220/EXPO-DROI_ET(2013)410220_EN.pdf, at 39.

[782] References to such scenarios are made in Chengeta, *Accountability Gap*, cit., at 49 (citing Melzer without further commenting); Geneva Academy Briefing No. 8, cit., at 24 (*idem*).

[783] On force majeure in international law, see *amplius* Paddeu, *A Genealogy of* Force Majeure *in International Law*, 82 British Yearbook of International Law (2011), 381-494; UN Secretariat, "Force majeure" *and* "Fortuitous Event" *as Circumstances Precluding Wrongfulness: Survey of State Practice, International Judicial Decisions and Doctrine*, 2 ILC Yearbook No. 1 (1978); Szurek, *Force Majeure*, in Crawford et al. (eds.), *The Law of International Responsibility*, cit., 475-480; Crawford, *State Responsibility*, cit., at 295-301.

[784] See *amplius* Paddeu, *A Genealogy of* Force Majeure, cit., at 437 ff. and *passim*. While until the half of the 19th century the prevailing conception of *force majeure* was that of an event, meeting certain characteristics of unforeseeability and irresistibility, understood quite broadly ('event-based' approach), subsequently it was conceived as strictly related to concrete situations occurred within the temporal boundaries of the event ('situation-based' approach). The distinction is not without a difference: in the first sense, 'war', 'civil strife' and so on were believed to constitute force majeure as a whole, and consequent injuries could not give rise to responsibility and indemnification. In the second sense, contrariwise, only the particular situation (for example, *that* devastation of property) is covered by the defense, which allows for responsibility and indemnification for other situations within the same event.

[785] See for instance ARS, cit., art. 23, § 3 (for the first category, the Commentary takes the example of 'stress of weather which may divert State aircraft into the territory of another State, earthquakes, floods or drought'; for the second, 'loss of control over a portion of the State's territory as a result of an insurrection or devastation of an area by military operations carried out by a third State'). See also Paddeu, *A Genealogy of* Force Majeure, cit., 394-395 (highlighting that 'it was made-man events … which played an important part in the development of the defence of *force majeure*').

surely falls within the second category, the applicability of the defense is virtually possible.[786]

Unpacking the requirements put forward by Art. 23(1) for force majeure to qualify ('*positive*' requirements), three elements deserve attention: (*i*) the 'unforeseeability' of the 'event'; (*ii*) the fact that the State invoking the defense could have no 'control' of the event; (*iii*) the 'material impossibility' of complying with international obligations resulting therefrom.

As for the first, it has been already observed that deploying LAWS without narrow-MHC implies a risk for unanticipated behavior of the weapon – especially when involving self-learning algorithms. Importantly, in such cases corporations will not only be contractors with the governments – thus receiving specific directives regarding the features LAWS need to have –, but they will also likely decline responsibility for malfunctioning that they notify the governments of. From the standpoint of the State it would thus be hard to claim that the wrongful event is completely unexpected,[787] and that the 'will of the State' is effectively nullified as commonly required.[788] *Force majeure* would thus hardly attach on such premises.

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[786] Traditionally *force majeure* (*vis major*) was a distinct concept from fortuitous case (*casus*): in international practice, however, the two notions have been often used interchangeably. See amplius UN Secretariat, *"*Force majeure*" and "*Fortuitous Event*" as Circumstances Precluding Wrongfulness*, cit., at 70-71 (explaining that 'fortuitous case' was traditionally associated with an event which cannot be foreseen but which, if foreseen, can be avoid, whereas force majeure is always inevitable as it ultimately depends on a factor deriving from outside the circle of those affected by the obligation). For our purposes, the employment of LAWS should fall into the traditional category of *casus*; in terms of legal conclusions, however, things do not change substantially should the opposite understanding prevail.

[787] In this context we employ the term 'event' as synonymous with 'situation', i.e. each particular event where malfunctioning can occur, in line with the 'situation-based' approach to *force majeure* that is today preferable. However, this conclusion may be rejected on the basis that the Commentary itself does not seem so demanding in respect of this requirement: '[t]o have been "unforeseen" the event must have been neither foreseen nor of an *easily foreseeable* kind' (see ARS, Art. 23, cit., § 2, italics added). It follows that an 'hardly foreseeable' event qualifies for the purposes of *force majeure*.

[788] See Paddeu, *A Genealogy of* Force Majeure, cit., at 452 (citing Ago's position on 'absolute impossibility'). As will be argued *infra*, potential circularities may be found in arguments

Secondly, it must be inquired whether the event of a LAWS behaving unforeseeably is really beyond the 'control' of the State deploying it. Here the requirement of narrow-MHC seems truly imperative: if MHC is not ensured over individual attack, and if the 'event' indicated by Art. 23 ARS is understood from a 'situation-based' approach (i.e.: as strictly related to concrete situations occurred within the temporal boundaries of the event), the risk materializes that States plead *force majeure* successfully.[789]

Thirdly, *force majeure* can be invoked only if performance of an international obligation is 'materially impossible': circumstances in which performance has become merely more difficult are admittedly not covered by the defense.[790] Applied to our case, it means that if a human agent had the concrete possibility to avoid the malfunctioning, but it was an hard choice because of, say, environmental constraints, State cannot rely on *force majeure*. However, in keeping with the scenario under consideration, it is conceded that States could not materially abide by IHRL/IHL obligations because of an *eccentric* factor (i.e. the malfunctioning): again, resorting to a 'situation-based' approach there may be some room for States to invoke *force majeure* vis-à-vis a *particular* malfunctioning.

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as such, inasmuch as they seem to rely on a specific mental element (*culpa* at the very least), whereas our scenario is posited to arise in circumstances where the 'situation' is not (and cannot be) anticipated. To argue that a malfunctioning can be anticipated *in abstracto* would mean that a degree of *culpa* is normatively established: mental requirement and causal nexus would result intermingled and ultimately undistinguishable. However, such confusion is in a way triggered by the Commentary itself, which fails to keep them distinct: for instance, in explaining the requirement of material impossibility, it is argued that the defense 'does [not] it cover situations brought about by the *neglect or default* of the State concerned, even if the resulting injury itself was accidental and unintended' (see ARS, cit., Art. 23, § 3 *in fine*, italics added).

[789] A counterargument can be put forward though: to say that the malfunctioning has occurred 'beyond the control' of the State deploying LAWS without narrow-MHC seems tautological, and overlooks the fact that the State, as a result of our remarks under (*i*), knew that a malfunctioning could have occurred (e.g. as the producer had so notified state authorities) and wittingly chose not to exert MHC over individual attack. In our view, this argument pertains to the negative elements of *force majeure*, so it will be tackled below.

[790] See ARS, Art. 23, cit., § 3: 'the situation must be irresistible, so that the State concerned has no real possibility of escaping its effects. *Force majeure* does not include circumstances in which performance of an obligation has become more difficult, for example due to some political or economic crisis'.

The ARS codifies also two 'negative' requirements, i.e. circumstances occurring which resort to *force majeure* is not viable (Art. 23(2)). These are: (*a*) the fact that the situation is 'due, either alone or in combination with other factors, to the conduct of the State'; (*b*) the fact that the State has 'assumed the risk of that situation occurring'.

As for the first, the wording allegedly refers to a causal nexus between State conduct and the event: in order to qualify, the exception to *force majeure* requires only a *factual* contribution ('either alone or in combination with other factors') by the invoking State.[791] In explaining Art. 23(2)(a) ARS the Commentary seems to attach importance also to the mental element of the State, as it argues that force majeure can be pled 'in situations in which a State may have *unwittingly* contributed to the occurrence of material impossibility by something which, in hindsight, might have been done differently but which was done *in good faith* and did not itself make the event any less unforeseen'.[792] An objective element (i.e. the causal nexus) is construed through subjective concepts ('unwittingly' and 'in good faith' recalling the notion of *culpa* at the very least), which appears contradictory: in order to avoid conceptual confusion it seems more appropriate that an interpretation of lit. (*a*) centered in the mere causal nexus prevail. The question would therefore have to be reformulated as follows: is an unanticipated decision, possibly reached via self-learning algorithms whose dangers the producer had warned the deploying State against, at least *etiologically* linked to the conduct of the State? In the affirmative – which is, in our view, the correct answer – the malfunctioning would be 'due to' the State conduct 'in combination of other factors' (namely,

[791] On this point see Paddeu, *A Genealogy of* Force Majeure, cit., at 455-458. The 1999 Second Report by Special Rapporteur Crawford intended to align the provision on force majeure with the one of Art. 61 VCLT (regarding supervening impossibility of performance of a treaty obligation) which was based on the 'wrongful act' of the invoking State. The first draft contained a threshold of 'contribution' to the situation of force majeure that appeared too 'strict' to Crawford.

[792] See ARS, Art. 23, cit., § 9, italics added. References to the intention and the good faith of the State may sound as attributing importance to the mental element of the State, and therefore to *culpability* – an issue that will be addressed below.

environmental and context-related conditions), and the exception to *force majeure* would attach.[793]

As for the other negative requirement, lit. (*b*) stipulates that *force majeure* cannot be pled by a State that 'has assumed the risk' of the particular situation occurring. Quite intuitively deploying LAWS may be considered as placing itself in a quintessential risky area. The Commentary suggests a quite narrow understanding of this negative requirement though, as it claims that 'the assumption of risk must be *unequivocal* and *directed towards* those to whom the obligation is owed'.[794] This position finds support in other documents and writings.[795] Whether such exception to *force majeure* can apply to LAWS is disputable: ordinarily States do not assume any risk associated with using a given weapon in armed conflict or law-enforcement operations, nor they do so vis-à-vis potential targets.

Should we conclude that LAWS lacking narrow-MHC create a state accountability gap? In our view, although the question is open to debate, an affirmative conclusion would at least require adequate explanation. Interpreting Art. 23 ARS in a way that ensures responsibility in cases of malfunctioning is a viable solution for three reasons. *First*, the Commentary – which admittedly sets a high bar for excluding the plea of *force majeure* – provides a guidance that is not binding as such: divergent practice may

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[793] In a way, this is the conclusion reached, though in hypothetical terms, by Melzer, *Human rights implications of the usage of drones and unmanned robots in warfare*, cit., at 39, who considers that 'genuinely unforeseen shortcomings in the design and programming of robotic system' may be said to fall outside the exception under lit. (*a*), and thus wonders whether 'the malfunction of a robotic system ever could be regarded as a cause which is "external" to the State operating the system as would normally be required for a situation of *force majeure* to arise'.

[794] See ARS, Art. 23, cit., § 10 *in fine*.

[795] See for instance UN Secretariat, "Force majeure" *and* "Fortuitous Event" *as Circumstances Precluding Wrongfulness*, cit., § 31: 'States may, however, renounce by prior agreement the exercise of such an exception. In the absence of a general rule to the contrary and unless the specific rule in question provides otherwise, the "exception of force majeure" may be invoked regardless of the characteristics of the non-performed international obligation'. The case under consideration thus involves explicit agreements in which the risk of the particular *force majeure* event is taken into account. It has been said that where a State assumes such risk the corresponding mode of responsibility would be an 'absolute' one: see Conforti, *Diritto internazionale*, cit., at 399.

emerge. *Second*, the plea of *force majeure* has found only a limited application in international adjudication so far:[796] such circumstance, coupled with changing social needs (notably, those associated with establishing clear and working modes of responsibility for autonomous systems), should reassure those concerned about State 'impunity'. *Third*, and possibly most importantly, most primary rules that we considered above (i.e. the right to life under IHRL; the principles of distinction and proportionality in IHL) are *jus cogens*: no circumstance precluding wrongfulness operates with respect to such norms, as stipulated by Art. 26 ARS and widely acknowledged by international practice.[797]

Concluding on *force majeure* and more generally on the objective element of state responsibility, it seems that MHC over individual attacks is desirable as it may *limit* (and not, importantly, remove) invocation of *force majeure* for unexpected and unforeseeable malfunctioning of LAWS.[798] It does not however seem that narrow-MHC is essential for establishing responsibility: also when particular engagements are not 'meaningfully' controlled by a human operator, state responsibility can attach. Difficulties may arise with respect to circumstances precluding wrongfulness; but it is argued that the way out is not necessarily offered by narrow understandings of MHC.

4.3.3.3 The Element of 'Fault' and the Concept of 'War Torts'

'Fault', in the broadest sense of the term (i.e. embracing both *dolus* and *culpa*), is '[o]ne of the most celebrated and controversial issues in the field

[796] See Paddeu, *A Genealogy of* Force Majeure, cit., at 494 ('[e]ven before this narrow codification [i.e. that of ARS], tribunals were skeptical of claims of *force majeure* and have, consequently, treated the plea with suspicion: the standard of proof required for pleas of *force majeure* by tribunal has been very high. In view of its current stringent requirements, a plea of *force majeure* will be upheld only very rarely').

[797] See ARS, cit., Art. 26, at 84-85.

[798] In this sense, only hacking, spoofing or similar risks would result in the machine behaving in a way that a human agent cannot effectively control. *Force majeure* could then be plead only in these limited circumstances.

of state responsibility'.[799] Importantly the ARS do not take fault into consideration, and for ages legal scholarship has been split between those who support an 'objective theory' of responsibility and those who support a 'fault theory'.[800] As of today, however, there allegedly is a convergence of such diverse theoretical approaches, in particular when it comes to specific issues.[801]

Accepting that objective responsibility is the general model for assigning state responsibility (as most scholars argue),[802] and reiterating what has been contended in the previous Paragraph, it follows that the unanticipated behavior of a LAWS resulting in the commission of an international wrongful act may not give rise to the deploying State's responsibility if this State successfully pleads *force majeure*, as such defense has traditionally been considered as the boundary for objective models of responsibility.[803] Such an outcome is viewed as troublesome by many commentators. Animated by an understandable dissatisfaction, Crootof argues that a model of 'strict liability' (as opposed to 'negligent liability') for wrongdoings committed through LAWS (which she labels 'war torts') would be desirable.[804] In particular, she suggests the adoption of a binding treaty that reiterates and clarifies the relevance of the law of state

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[799] See Luzzatto, *Responsabilità e colpa in diritto internazionale*, 51 Rivista di Diritto Internazionale No. 1 (1968), 53-107, at 57, translation mine.

[800] It is not possible to explain those positions in detail. See *amplius* UN Secretariat, "Force majeure" *and* "Fortuitous Event" *as Circumstances Precluding Wrongfulness*, cit., §§ 489 ff. (citing authors from Grotius onwards and summarizing and briefly commenting on their positions). Famously Anzilotti contrasted the fault-based view of Grotius by arguing that responsibility must be understood in objective terms.

[801] See more extensively Pisillo Mazzeschi, *"Due Diligence"*, cit, particularly at 69 ff.: the Author explains the main positions that legal scholars have taken, and concludes that there is a clear convergence towards the 'objective' or 'mixed' approach to international responsibility.

[802] To name only one, see Conforti, *Diritto internazionale*, cit., at 397-399.

[803] See De Sena, *Condotta di singoli organi e condotta dell'apparato statale in tema di colpa nell'illecito internazionale*, 71 Rivista di Diritto Internazionale No. 3 (1988), 525-553.

[804] Crootof, *War Torts*, cit., *passim* (introducing this concept after shedding light on the likely accountability vacuum resulting from the use of LAWS). However, it must be noted that the Author regrettably does not take into due account the role of force majeure and the issue of fault in state responsibility, rather focusing on civil-law domestic concepts.

responsibility as well as common definitions that are particularly troubling in the debate around LAWS.[805] In addition to being founded on sound historical basis,[806] a model of pure objective responsibility – or 'absolute' responsibility – is not without a precedent in international law.[807]

The solution of creating a mode of absolute responsibility for the use of LAWS is certainly an optimal solution *de jure condendo*; whether consent can be reached within the international community to adopt an adequate legal instrument is something that one can legitimately be doubtful about. Still open, in every case, would be the interpretive path towards a present-day understanding of *force majeure* as put forward in the previous Paragraph. As for the role that a narrow understanding of MHC, it seems that in order to establish state responsibility its role should not be overestimated, as it is at no point decisive as such: it may render assignation less easy, and require renewed theoretical efforts to establish a clear, operative framework. *The lack of human presence at each targeting decision*

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[805] See *ibidem*, at 1396 ff. (considering also the role that may be played by customary law and soft law).

[806] The Author relies on the circumstance that 'strict liability is usually applied to lawful but inherently dangerous activities, such as possession of an animal with dangerous propensities or engagement in abnormally dangerous activities', and further observes that '[n]ot only are the independent actions of [LAWS] not fully predictable, they are also inherently dangerous … [t]he use of [LAWS] … is therefore "ultra-hazardous" – it involves a risk of serious harm that cannot be eliminated, even if utmost care is exercises'; *ibidem*, at 1396. In tort law, such mode of responsibility has been accepted long ago, when dangerous activities related to the industrial revolution became an everyday concern for legal systems: see *amplius* Pisillo Mazzeschi, *"Due Diligence"*, cit., particularly at 134-146. Crotoof's suggestion can be paraphrased as follows: given that a major concern of contemporary societies is how to ensure proper liability for robot's actions, why not introducing a legal regime of responsibility that is independent of 'fault'?

[807] *Convention on International Liability for Damage Caused by Space Objects*, adopted by the UNGA on 29 November 1971, Res. 2777 (XXVI), annex, 26 U.N. GAOR Supp. (No. 29) at 25, UN Doc. A/8429, Art. II: 'A launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft flight'. The model of absolute responsibility has been proposed for ultra-hazardous State activities in fields such as that of transboundary harm: see for instance *International Liability For Injurious Consequences Arising Out Of Acts Not Prohibited By International Law (International Liability In Case Of Loss From Transboundary Harm Arising Out Of Hazardous Activities)*, UN Doc. A/CN.4/531, 21 March 2003. For a discussion on the models of objective and absolute liability in international law, see also De Sena, *Condotta di singoli organi*, cit., particularly at 531 ff.; and Pisillo Mazzeschi, *"Due Diligence"*, cit., at 128 ff. and 352 ff..

leaves a gap that can actually be filled with something else, if the ultimate goal is holding someone (or something) responsible.[808]

4.3.3.4 Reparations

Lastly, the impact of the concept of MHC on reparations must be assessed. In legal theory assigning responsibility is prodromal for reparation;[809] when it comes to the violation of primary obligations of IHRL/IHL, a key issue, still debated among legal scholars, is whether individuals (*recte*: victims) enjoy a veritable 'right to remedy' against the State,[810] not to mention against corporations.[811]

Naturally the right to remedy applies to violations occurred as a result of the use of weapons,[812] and therefore of LAWS.[813] On closer

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[808] In this sense, we contrast an opinion that has been put forward by Chengeta, *Accountability Gap*, cit., at 50: '[the] accountability gap can only be dealt with by making sure that humans maintain a [MHC] over [LAWS] even after deployment'.

[809] The consequences of state responsibility are addressed by Part II of ARS: in particular States must cease the unlawful conduct and offer assurances of non-repetition (Art. 30), and make full reparation for the injury caused (Art. 31). For a general overview of reparation, see Iovane, *La riparazione nella teoria e nella prassi dell'illecito internazionale*, Milan, 1990.

[810] The existence of such right is inferable at least from IHRL treaty provisions (such as Art. 8 UDHR; Art. 2 ICCPR; Art. 41 ECHR; Art. 63(1) ACHR; Art 7 ACHPR), as well as from IHL provisions (namely Art. 3 Hague Convention IV and Art. 91 API) and also ICL (for instance Art. 75 of the Rome Statute). Importantly also the UNGA has recognized such right, albeit in non-binding terms: see *Basic Principles and Guidelines on the Right to a Remedy and Reparation for Victims of Gross Violations of International Human Rights Law and Serious Violations of International Humanitarian Law*, adopted by the UNGA on 16 December 2005, UN Doc. A/RES/60/147. See *amplius* Pisillo Mazzeschi, *Reparation Claims by Individuals for State Breaches of Humanitarian Law and Human Rights*, 1 Journal of International Criminal Justice No. 2 (2003), 339-347 (who considers the victim's right to reparation in the fields of IHRL and then IHL and argues that it is difficult to find an 'unitary' customary rule establishing the individual's right to reparation).

[811] See *UN Guiding Principles*, cit., particularly at §§ 25 ff..

[812] See in particular Burke & Persi-Vicentic, *Remedies and Reparations*, in Casey-Maslen (ed.), *Weapons under International Human Rights Law*, cit., 542-590, particularly at 554 ('[Unlawful] use of a weapon will give rise to a right to a remedy or reparation').

[813] See Chengeta, *Accountability Gap*, cit., at 5 ('[t]o the list [of weapons whose use gives rise to responsibility] … I add [LAWS]. The accountability challenges that are posed by [LAWS] must be taken seriously as they threaten some aspects of victims' right to remedy'). The issue of victims' right to remedy is taken into account also by Geneva Academy Briefing No. 8, cit., at 23-24.

inspection, however, it does not seem that LAWS without narrow-MHC raise as such insurmountable problems; rather, they might aggravate a current trend of inadequate or ineffective remedies.[814] For instance, accepting that remedy takes a threefold shape (access to justice; access to reparation; access to information)[815], the victims' right to access to an 'effective judicial remedy' is a matter for States, irrespective of the weapon used for a particular engagement.[816] A particular – and more understandable – concern regards access to information or 'right to truth'.[817] We already tackled the issue when we discussed the primary rules under both IHRL and IHL regarding the obligation to conduct effective and adequate investigations into relevant losses of life, so we will not restate our remarks here. Suffice it to say that provided that LAWS offer a 'right to legibility', and thus that it is possible to understand *ex post facto* why a LAWS has acted as it did, the relevant obligation – here, the secondary obligation to provide victims with a right to access information – would be considered fulfilled.

In sum, MHC over individual attacks does not seem to be implied by the current provisions on reparations; the obstacles to be overcome are others and of a different nature.

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[814] For instance, see Hammond, *Autonomous Weapons Systems and the Problem of State Accountability*, cit., at 677 ff. (pointing at two important hindrances for victims, namely their inability to sue States before the ICJ and the difficulty in activating civil remedies provided by domestic legal systems). Domestic-law obstacles such as the 'act of government' theory and the exception of foreign States' jurisdictional immunity are traditionally invoked by scholarship to demonstrate the limited effectiveness of the victims' right to remedy: see Pisillo Mazzeschi, *Reparation Claims*, cit., at 344 ff., which leads us to conclude that with respect to this LAWS do not pose new challenges. Chengeta's opinion cited *supra* therefore seems too rushed.

[815] See *UN Basic Principles*, cit., § 11.

[816] There is some disagreement; for instance, Chengeta believes that the use of LAWS will likely result in the violation of the victims' right to have offenders prosecuted (as a result of the alleged accountability gap), or of the victims' right to satisfaction (as 'the person who deployed the machine may offer the apology but it is not the same since he or she was not the person on the ground'; see Chengeta, *Accountability Gap*, cit., at 10).

[817] See *UN Basic Principles*, cit., § 22 ('[s]atisfaction should include, where applicable, … (b) verification of the facts and full and public disclosure of the truth'), and § 24 (entitled 'access to relevant information concerning violations and reparation mechanisms).

4.3.4 Conclusion

Our journey through international responsibility has made clear that autonomous killing, performed via LAWS lacking MHC over individual attacks, is undeniably a concern, as it *may* – but not necessarily *does* – result in accountability gaps. A remedy that some have proposed would consist in retaining human presence (in the shape of 'control') over selection and engagement of every particular target. We demonstrated, however, that this remedy is just… *one* remedy out of several others. Individual (criminal) responsibility must not attach when culpability is not at issue; victims must instead access adequate remedies, and in such view corporate and state responsibility are two viable options. We also argued that the international community may efficiently work the problem out, for instance adopting a binding instrument that regulates the matter and assigns responsibility properly. As far as state accountability is concerned, in particular, the shortcomings of a model of responsibility where States may invoke *force majeure* can be corrected by establishing an 'absolute' model of responsibility, which some commentators have already begun to outline. In all cases, it has been demonstrated that if the ultimate goal of MHC (in its narrow understanding) is to avert any possible accountability gap, it is not necessary as such. In short, the need for maintaining human presence at each application of lethal force against individuals should be grounded *elsewhere*.

4.4 MHC as a Tool for Preserving Human Deliberation

As stated at the beginning of the previous Paragraph, the accountability-based approach to MHC is not the only one to have been proposed in the debate on LAWS so far. According to another understanding of the concept, there is a need for MHC not only in order to avoid 'accountability gaps' (i.e.

the *pathology* of LAWS), but for stronger, much more deontological reasons: autonomous killing, where human agents play no part in deliberating individual use of lethal force, would be at odds with the core principles that animate IHL and IHRL, respectively humanity and human dignity.[818] This second profile pertains to the *physiology* of LAWS: MHC would be triggered every time that human life may be taken by a non-human agent, irrespective of whether the particular killing is lawful under relevant law. Preserving human presence at *each* act of delivering lethal force against an individual therefore finds a justification beyond establishing responsibility: in other words, it is sometimes perceived as an *a priori* requirement rather than an *a posteriori* one.

Among States, it is the Holy See in particular that has repeatedly supported this position. The need for retaining MHC over individual attacks is justified in that '[d]ecisions over life and death inherently call for human qualities, such as *compassion* and *insight*, to be present'.[819] More precisely, '[t]he disappearance or concealment of the human agent is problematic not only from the point of view of the ethics of responsibility, but also from the point of view of the foundation of law. (…) A machine is only a complex set of circuits and this material system cannot in any case become a truly morally responsible agent. In fact, for a machine, a human person is only a datum, a set of numbers among others'.[820] The Holy See's argument is paved in unequivocal moral considerations: only a human agent would treat another human agent *morally*, i.e. as another *se*.[821] In other

[818] For the purposes of the present Chapter we will employ 'humanity' and 'human dignity' according to their definition and understanding(s) as explained in Chapters II and III.

[819] See the Statement of the Permanent Representative of the Holy See to the United Nations and Other International Organizations in Geneva at the First Meeting of Experts on LAWS of the High Contracting Parties to the CCW, 13 May 2014, at http://www.unog.ch/80256EDD006B8954/%28httpAssets%29/D51A968CB2A8D115C1257CD8002552F5/$file/Holy+See+MX+LAWS.pdf.

[820] Unfortunately the Holy See's statement at the 2017 GGE is not displayed on the website of UNOG.

[821] Such view is well grounded in the Catholic Social Teachings. See *Compendium Of The Social Doctrine Of The Church*, Part 1, Chapter 1, III, a), § 34 ('[b]eing a person in the image and likeness of God (…) involves existing in a relationship, in relation to the other 'I''); and

words, in their aiming structurally at separating a specific use of force against humans from a specific human deliberation LAWS reveal a radical asymmetry between the one who (*recte*: which)[822] applies the force and the one who receives it: it is a brand-new, unprecedented form of asymmetry, namely in humanity. MHC in its narrow interpretation would avoid such outcome. Some scholars have proposed a similar argument in analogous terms, resorting to the (divisive) idea of 'human dignity'.[823] On closer inspection, the essence of this group of arguments lies in that non-human decision-makers (as LAWS are) 'have no understanding of the importance of life, and of the implications of taking it':[824] emphasis here is therefore not

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also *Address Of His Holiness Pope Francis In The Fourth Course For The Formation Of Military Chaplains On International Humanitarian Law Promoted By The Pontifical Council For Justice And Peace*, Clementine Hall, 26 October 2015 ('we must never give in to the temptation of considering the other as merely an enemy to destroy, but rather as a person endowed with intrinsic dignity, created by God in his image').

[822] See *amplius* the debate around the nature of LAWS in Chapter 2.

[823] See *Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions*, cit., particularly at § 95 ('[d]eploying LARs has been depicted as treating people like "vermin", who are "exterminated." These descriptions conjure up the image of LARs as some kind of mechanized pesticide', references omitted); Asaro, *Jus Superveniens: robotic weapons and the Martens Clause*, in Calo-Froomkin-Kerr, *Robot Law*, 2016, 385 ('this also relates to the question of human dignity. If a combatant is to die with dignity, there must be some sense in which that death is meaningful. In the absence of an intentional and meaningful decision to use violence, the resulting deaths are meaningless and arbitrary, and the dignity of those killed is significantly diminished'); Ulgen, *Human Dignity in an Age of Autonomous Weapons: Are We in Danger of Losing an "Elementary Consideration of Humanity"?*, 9 ESIL Conference Paper Series No. 8 (2016), at 8 ('[h]uman targets are denied the status of rational agents with autonomy of will, and arbitrarily deemed irrational agents subject to extrajudicial killings or sub-humans not worthy of human face-to-face contact'); Id., *Kantian Ethics in the Age of Artificial Intelligence and Robotics*, Questions of International Law, Zoom-In 43 (2017), 59-83, at 79 (insisting that '[h]uman moral reasoning involves a combination of comprehension, judgment, experience, and emotions', and that the replacement of human decision-making when targeting another human is at variance with the notion of 'objective end'). See also Sparrow, *Robotic Weapons*, cit., at 11 (according to whom allowing a machine to take decisions about human life is patently contrary to any moral imperative: it would mean, for a belligerent party, to literally 'treat [its] enemies like vermin', i.e. refusing to acknowledge a common humanity that both sides share). Critically Evans warns against such 'dissemination of sensationalist, fear-mongering rhetoric aimed at persuading the public, impressionable states [sic!], or NGOs that the challenged weapons are abhorrent': see Evans, *At War With Robots*, cit., at 727.

[824] See Heyns, *Autonomous weapons in armed conflict and the right to a dignified life*, cit., at 58.

placed on accountability, rather on capacity of *understanding* the gravity of a decision.[825]

On the other hand, this understanding of MHC is contrasted by those who argue that 'humanity' (and thus 'human dignity') do not refer 'to some idea that humans must operate weapons', but instead to the need for limiting exposure to lethal force.[826] In other words, what matters would be that *how well* the actor performs according to IHL and IHRL, and not whether that actor is a human or non-human agent. Hence the reason why narrow-MHC is often looked at as a stubbornly deontological requirement that risks jeopardizing effective protection of humans.[827]

The inescapable corollary to such conception of MHC is that autonomous killing, performed through ATC as described above, would run *per se* counter to it. No surprise that those who support a ban on LAWS rely significantly on MHC in its stronger version; the crux of the matter is however *to what extent* does such understanding of MHC constitute a *legal* yardstick.

4.5 Legal Nature of MHC

Literature on MHC is blossoming today: while engineers focus on more technical issues,[828] philosophers (and moral philosophers in particular) have already proposed even a 'theory' for MHC.[829] International lawyers have an

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[825] See also O'Connell, *Banning Autonomous Killing*, cit., at 230 ('[w]hat seems unprogrammable is conscience, common sense, intuition, and other essential human qualities').

[826] See Anderson-Reisner-Waxman, *Adapting the Law of Armed Conflict to Autonomous Weapon Systems*, 90 International Law Studies (2014), 386-411, at 410.

[827] See Crootof, *A Meaningful Floor*, cit., at 62 ('[a]ny definition of meaningful human control that would prioritize human control at the cost of increased risk to soldiers and civilians must be rejected outright').

[828] See *ex multis* Bradshaw et al., *From tools to teammates*, cit. (where the Authors propose a cooperative integration of human operators and autonomous systems).

[829] See for instance the recent contribution by De Sio-Van Den Hoven, *Meaningful Human Control over Autonomous Systems: A Philosophical Account*, 5 Frontiers in Robotics and AI No. 15 (Feb. 2018), 1-14. In short, the Authors argue that by adopting the so-called 'compatibilist' theory of moral responsibility (according to which human agent may be

interest in MHC too: what makes the subject of the current debate is the legal nature of such concept.

The purpose of the present Paragraph is to explore MHC as a normative concept – a point that is crucial for our discussion. Finding that MHC in its narrowest meaning (i.e. as requiring human presence at each and every deliberation of using force against a human target) is already a *legal* (and not just an *ethical*) requirement would rule out LAWS as we defined them. The debates that are taking place at the relevant international fora would therefore settle for a mere restatement of existing law (*de jure condito*), refraining from introducing new regulation (*de jure condendo*). Three are the categories which MHC could fit in: first, customary or treaty law (4.5.1); second, general principles of international law, namely those applicable to the use of force (4.5.2); again, as general principles only as a programmatic (i.e.: non-binding) source of law (4.5.3).

4.5.1 MHC as Treaty and Customary Law

The first question that has to be asked is whether existing customary or treaty law do actually require MHC to be present at each application of force.

According to the analysis that has been conducted so far,[830] all IHL- and IHRL-relevant treaties do not contemplate MHC as such. As has been correctly observed, it is a concept that was born out of the discussions around LAWS and that had never been expressed before.[831] On closer inspection, also in the debate at the CCW forum references to MHC are

morally responsible for their actions even if they do not exercise any special power to carry out their actions) it would be possible to conclude that delegating decision-making processes to non-human agents (as LAWS are) does not amount to a disappearance of human responsibility over decisions and actions.

[830] See Chapters II and III.

[831] See in particular the analysis conducted in Marauhn, *Meaningful Human Control – and the Politics of International Law*, in Heintschel von Heinegg et al. (eds.), *Dehumanization of Warfare*, Cham, 2018, 207-218 (stressing that far from introducing a legal standard, the concept of MHC 'has served as a political driver in the discussions held in Geneva so far', at 211).

made in a quite scattered fashion:[832] the reason may be said to lie in that, in addition to being 'inherently imprecise', MHC is employed as a neatly *politicized* concept.[833] Such consideration has brought most commentators to conclude that MHC could at most 'augment' existing treaty obligations (such as IHL rules on targeting), thus standing as a 'regulatory concept' rather than an independent treaty norm.[834]

The same goes for customary law, which as is known embraces both the requirements of *opinio juris* and general practice:[835] neither the former nor the latter do actually attach when it comes to MHC. States have remarkably divergent views on the very content of MHC: as already stated, while virtually *every* State agrees that some form of human control must be retained over lethal actions, they support radically opposed positions with respect to LAWS.[836] It follows that it is extremely difficult – if not impossible

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[832] *Ibidem*, at 209-211: the Author observes that the report of the 2013 CCW Meeting of High Contracting Parties uses the term only once; in the program of work for the 2015 MoE the term is referred to twice, while again in the Chair's letter for the 2016 MoE only once.

[833] A fact that has been pointed out by Crootof, *A Meaningful Floor*, cit., particularly at 53 (highlighting the principle's popularity especially among those actors who overtly support a ban on LAWS, for quite self-evident reasons).

[834] Quotes are from Crootof, *A Meaningful Floor*, cit., at 55. In the same line, see Marauhn, *Meaningful Human Control*, cit., at 212 ('[m]y conclusion … is that the concept of [MHC] should not be framed and used as a legal concept. Rather, use should be made of existing and (largely) undisputed rules of [IHL]').

[835] Following the famous *dictum* in ICJ, *North Sea Continental Shelf (Federal Republic of Germany v. Denmark; Federal Republic of Germany vs. Netherlands)*, judgment, 20 February 1969, ICJ Rep. 3, 44, § 77: '[n]ot only must the acts concerned amount to a settled practice, but they must also be such, or be carried out in a such way, as to be evidence of a belief that the practice is rendered obligatory by the existence of a rule of law requiring it'.

[836] For the Russian Federation's position, see the Working paper submitted for the 2017 GGE session, available at: https://www.unog.ch/80256EDD006B8954/(httpAssets)/2C67D752B299E6A7C12581D400661C98/$file/2017_GGEonLAWS_WP8_RussianFederation.pdf ('[w]e do not doubt the necessity of maintaining human control over the machine'). Consider also the position expressed by the NAM group, available at: https://www.unog.ch/80256EDD006B8954/(httpAssets)/E9BBB3F7ACBE8790C125825F004AA329/$file/CCW_GGE_1_2018_WP.1.pdf ('NAM is pleased that a general sense has developed among High Contracting Parties that all weapons, including those with autonomous functions, must remain under the direct control and supervision of humans at all times').

– to read such affirmations through the lenses of *opinio juris*.[837] MHC plays a role as a political compromise to restate broad agreement: the moment in which it is called to act as a normative ruler it will be surely abandoned.

On closer inspection, however, there is at least one recent development that has to be put under the spotlight, if only to show that MHC is starting to make its way in international law beyond the traditional fora. In November 2015 the African Commission on Human and Peoples' Rights (ACommHPR) released General Comment No. 3 on the Right to Life (Art. 4 ACHPR).[838] In the Section regulating use of force during armed conflict it is established: '[a]ny machine autonomy in the selection of human targets or the use of force should be subject to meaningful human control' (§ 35).[839] To our knowledge this is the first time that MHC is expressely referred to in a General Comment to an IHRL treaty. Albeit void of binding effect, instruments such as General Comments are of paramount importance, as they both guide interpreters in applying the corresponding treaty to new, unprecedented cases and may be used to assess the evolution of customary law: in short, it may contribute to elevating MHC to treaty or eventually customary law.

That the requirement of MHC is expressed in an official text, however, avails our initial intuition (i.e. MHC has not gained an autonomous *locus standi* in international law yet) rather than contradicting it. *First*, a single reference in a non-binding document could inspire an

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[837] It is possible to compare and contrast, for example, the views expressed by the Delegations of Switzerland and Norway at the 2014 MoE (both available at https://www.unog.ch/__80256ee600585943.nsf/(httpPages)/a038dea1da906f9dc1257dd90042e261?OpenDocument&ExpandSection=1#_Section1). While basically sharing the same position on LAWS, the first contends that MHC may provide for a working solution to the debate (a future-oriented approach) and the second suggests that existing forms of MHC are taken into consideration to elaborate a comprehensive standard (a past/present-oriented approach).

[838] *General Comment No. 3 on the African Charter on Human and Peoples' Rights: The Right to Life (Article 4)*, availabe at http://www.achpr.org/instruments/general-comments-right-to-life/.

[839] § 35 so begins: '[t]he use during hostilities of new weapons technologies such as remote controlled aircraft should only be envisaged if they strengthen the protection of the right to life of those affected'.

interpretative practice by the ACHPR's judicial bodies or it could not: in any case, as of today the requirement of MHC is not legally binding. *Second*, the relevant notion is at no point explained: it is hard for any intepreter to derive a precise meaning (broad or narrow) therefrom. No footnote containing relevant citations is provided.[840] *Third*, and as further proof, the relevant paragraph so concludes: '[t]he use of such new technologies should follow the *established rules of international law*'.[841] Again, a (quite innovative!) reference to MHC gets *de facto* depotentiated by a concluding remark that recalls existing rules of IHL/IHRL.

In the same, innovative line reference must be made to at least two important documents that cite MHC. First, on September 12, 2018 the European Parliament adopted a resolution regarding LAWS aimed at urging the development of a common position on the matter before the 2018 meeting of States party to the CCW.[842] The concept of MHC is cited three times, without being defined at any point.[843] It is worth noting however that as the EU organ endowed with most democratic legitimization the Parliament has taken a remarkable strong position *against* LAWS:[844] the

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[840] Tellingly, see Heyns, *Autonomous weapons in armed conflict*, cit., at 66-67: just after quoting General Comment No. 3, the Author – who, again, is one of the fiercest critics of LAWS – adds: '[h]owever, there is still great uncertainty about what the concept entails'.

[841] See *General Comment No. 3*, cit., at § 35 *in fine*.

[842] See European Parliament, *Resolution of 12 September 2018 on autonomous weapon systems (2018/2752(RSP))*, P8_TA-PROV(2018)0341. At the time of the writing only the provisional text is available.

[843] Ibidem, considering B ('whereas the term 'lethal autonomous weapon systems' refers to weapon systems without [MHC] over the critical functions of selecting and attacking individual targets'); 'considering' L ('whereas Parliament has repeatedly called for the urgent development and adoption of a common position on lethal autonomous weapon systems, for an international ban on the development, production and use of lethal autonomous weapon systems enabling strikes to be carried out without [MHC], and for a start to effective negotiations for their prohibition'); No. 2 ('[c]alls on the Vice-President of the Commission / High Representative for Foreign Affairs and Security Policy (VP/HR), the Member States and the European Council to develop and adopt, as a matter of urgency and prior to the November 2018 meeting of the High Contracting Parties to the Convention on Certain Conventional Weapons, a common position on lethal autonomous weapon systems that ensures [MHC] over the critical functions of weapon systems').

[844] As clearly stems from No. 3, *ibidem*: '[u]rges the VP/HR, the Member States and the Council to work towards the start of international negotiations on a *legally binding*

matter is now up to the Council and other EU institutions taking part to the CCW's meetings. Such development, yet to be welcomed as an important step in the discussion around LAWS, tells little to nothing about the status of MHC in contemporary international law: in addition to being left undefined, as already observed, the document *de quo* is a resolution, i.e. a non-binding source of EU law. It follows that its impact on State conduct might be irrelevant; however, it must not be underestimated that, in spite of its legal nature, MHC might inspire an according state practice from now on.[845] As a matter of fact there has already been some progress at the domestic level.[846]

In conclusion, what is inferable from the foregoing is that as of today MHC has no independent standing in IHRL and IHL. Neither treaty law nor customary law has developed to the point that MHC can be considered as a binding requirement when lethal force is used against a human target. Our analysis, however, has been useful to shed light on a particular circumstance, namely that the number of actors against LAWS inasmuch as lacking MHC is effectively increasing. The positions of Belgium and the EU is telling in this sense. Whether this can be regarded as an *emerging practice* for the purposes of the formation of a new customary norm is still an open

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instrument prohibiting [LAWS]', italics mine. It therefore can be said that the EU in its democratic composition favors the adoption of a ban on this technology.

[845] The circumstance that rules contained in resolutions of international bodies can inspire customary law (through *opinio juris* and general practice) is largely acknowledged in legal scholarship. See Conforti, *Diritto internazionale*, cit., at 44.

[846] This is the case, for instance, of the Belgian Parliament which, in June 2018, has voted a proposal of resolution, to be addressed to the Federal Government, urging them to support a ban on LAWS (as well as on armed drones!): see Chambre des Représentants de Belgique, *Proposition de résolution visant à interdire l'utilisation, par la Défense belge, de robot tueurs et de drones armés*, 27 June 2018, Doc. 54 3203/001, at: https://www.lachambre.be/kvvcr/showpage.cfm?section=/flwb&language=fr&cfm=/site/wwwcfm/flwb/flwbn.cfm?lang=F&legislat=54&dossierID=3203. As for Italy, to the writer's best knowledge there has been only a parliamentary motion for the Government to take active part to the debate at the CCW forum: see Motion No. 1-01776, 6 December 2017, Session No. 898 of the Chamber of Deputies, available at http://aic.camera.it/aic/scheda.html?numero=1/01776&ramo=CAMERA&leg=17 (stressing that Italy's position must be as such that human operators maintain ultimate decision on using lethal force and sufficient control on future LAWS).

question. No doubt that legislative bodies, as state organs, are entitled to exercise law-making functions in the international legal order; more questionable is, however, the fact that a practice is taking shape when the relevant legal concept (i.e.: MHC) is never defined. It therefore seems necessary that the actors involved in the debate struggle to adopt a common understanding of MHC, at the very least in order to clarify which purpose the concept must be oriented to.

4.5.2 MHC as a General Principle of International Law

One author argues that MHC stands as a '*principle* … that has historically been taken for granted – assumed but never stated'.[847] Of particular interest in this affirmation are two aspects: MHC is treated as a *principle* and not as a rule; it is stated as an *implicit* principle.

First, the distinction between rules and principles is well-known in legal theory,[848] and has gained attention by international-law scholarship as well.[849] International practice enumerates 'general principles of law' as a

[847] See Asaro, *Jus Nascendi*, cit., at 383, italics mine.

[848] For a general overview of the distinction, reference must be made to the pioneering contribution of Dworkin, *Taking Rights Seriously*, London, 1978, particularly at 24 ff. (stating that while rules are applicable 'in an all-or-nothing fashion', principles are more nuanced and incline 'in one direction or another'). In a similar line, it has been said that principles are '*prima facie* requirements' in the sense that they do not stand as absolute truth but rather structurally require an accurate process of balancing (whereas rules work in the realm of 'subsumption'). See *amplius* Alexy, *On Balancing and Subsumption. A Structural Comparison*, 16 Ratio Juris No. 3 (2003), 433-449. For an account of principles as an open-ended source of law, see also Guastini, *Filosofia del diritto positivo*, cit., at 60; see also Pino, *Teoria analitica del diritto. I. La norma giuridica*, Pisa, 2016, particularly at 73-96.

[849] See *ex multis* Voigt, *The Role of General Principles in International Law and Their Relationship with Treaty Law*, 31 Retfærd Årgang No. 2 (2008), 3-25; Besson, *General Principles of International Law: Whose Principles?*, in Besson-Pichonnaz (eds.), *Les principes en droit européen – Principles in European Law*, Zurich, 2011, 19-64; Biddulph-Newman, *A Contextualized Account of General Principles of International Law*, 26 Pace International Law Review No. 2 (2014), 286-344; Pisillo Mazzeschi-Viviani, *General Principles of International Law: From Rules to Values?*, in Pisillo Mazzeschi-De Sena (eds.), *Global Justice, Human Rights and the Modernization of International Law*, Cham, 2018, 113-161; D'Aspremont, *What Was Not Meant to Be: General Principles of Law as a Source of International Law*, in Pisillo Mazzeschi-De Sena (eds.), cit., 163-184; De Sena, *Prassi, consuetudine e principi nel campo dei diritti dell'uomo. Riflessioni internazionalistiche*, 43 Ragion Pratica No. 2 (2014), 511-540 (focusing on the peculiar role played by general principles in the field of human rights law and

source of international law,[850] as established *inter alia* by Art. 38(1)(c) of the ICJ Statute:[851] reference here is made to 'general principles of law recognized by civilized nations'. It is generally acknowledged that this source of law encompasses two distinct categories of principles, namely: (1) those recognized by States in their legal orders (i.e. *in foro domestico*); and (2) those that are identified through a process of deduction from existing rules of international law.[852] According to some, this dichotomy is but the inevitable consequence of the confrontation between two radically divergent theories of law – namely legal positivism and natural law – that took place at the time of the drafting of the Statute of the PCIJ, and can fairly be said to exist at present day as well.[853] In particular, general principles according to the second meaning play an important role in natural law (sometimes referred

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stressing the differences from customary law applicable thereto). For a traditional account of general principles in international law, see also Verdross, *Les principes généraux de droit dans le système des sources du droit international public*, in Guggeheim (ed.), *Receuil d'études de droit international en hommage à P. Guggenheim*, 1968, Geneva, 521–530.

[850] For an overview on the notion of 'source' of law, with specific regard to international law, reference can be made to Kolb, *Principles as Sources of International Law (With Special Reference to Good Faith)*, 53 Netherlands International Law Review No. 1 (2006), 1-36, particularly at 4 (contrasting legal positivism and twentieth-century legal theory interested in extra-positive law).

[851] The formulation of the clause is identical to that contained in the Statute of the PCIJ. In addition to it, suffice it here to recall Art. 21(1)(b) and (c) of the Statute of the ICC (making reference respectively to 'principles and rules of international law' and to 'general principles of law derived by the Court from national laws of legal systems of the world including, as appropriate, the national laws of the States that would normally exercise jurisdiction over the crime'). For a critical appraisal of construing general principles as a source of law, see D'Aspremont, *What Was Not Meant to Be*, cit., *passim* and at 168 (arguing that 'the elevation of general principles of law into one of the sources of the rules applicable by the Court can be construed as a fundamental reinvention of general principles that departed from earlier arbitral practice and legal thought').

[852] For an appraisal of the distinction, see *ex multis* Bonafè-Palchetti, *Relying on general principles in international law*, in Brölmann-Radi (eds.), *Research Handbook on the Theory and Practice of International Lawmaking*, Cheltenham, 2016, 160-176, and references quoted therein. The difference between the two categories of general principles is clearer in francophone scholarship, which appropriately distinguishes between 'principes *du* droit international' (i.e. deducted from international-law rules) and 'principes *de* droit international' (i.e. *in foro domestico*): see Dailler-Forteau-Pellet, *Droit international public*[8], Paris, 2009, at 380.

[853] See the in-depth analysis of the discussions that took place on that occasion provided for by Pisillo Mazzeschi-Viviani, *General Principles of International Law*, cit., at 123-125 (stressing that the final formulation of the clause was a 'compromise text').

to also as 'neo-natural law' or 'neo-constitutionalism') theories, inasmuch as structurally open to extra-positive influences (e.g. moral imperatives such as justice or fairness).[854]

Before assessing whether and to what extent MHC can be treated as a general principle of international law it is necessary to clarify a preliminary point: it is general principles *qua* deduced from existing rules of international law (and more precisely: from those regulating the use of force against individuals in IHL and IHRL) that will be under scrutiny.[855] Having clarified this, it is now essential to answer to the question as to whether MHC has features akin to those of other principles that are commonly regarded as general principles of international law. Should this be the case, States and other international actors would be required to treat MHC as a (binding) source of international law. This may eventually lead to the conclusion that LAWS are already prohibited *as such* by existing international law.

To begin with, several theses have been put forward regarding the category of general principles of international law.[856] Most authors agree that these general principles pertain to legal logic (thus valid for every legal

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[854] See Pisillo Mazzeschi-Viviani, *General Principles of International Law*, cit., at 119-120 (arguing that according to neo-constitutionalims 'in the construction of the principles, the interpreter and especially the judge exercises a normal function of "discovery" of the existing non-written law'). For further reflection on principles and morality, see also Dworkin, *Taking Rights Seriously*, cit., at 22 (contending that principles have a binding nature by reason of their being 'a requirement of justice or fairness or some other dimension of morality').

[855] For self-evident reasons, general principles as deduced from the majority of municipal legal orders remain outside the field of our investigation.

[856] On this topic, see *amplius* Pisillo Mazzeschi-Viviani, *General Principles of International Law*, cit., at 128 ff. (comparing and contrasting at least four main theses on general principles of international law as deducted from the international legal order itself, and concluding that as a matter of fact most of them tend to overlap in the so-called 'mixed' or 'hybrid' theses). As far as the functions of general principles of international law are concerned, see more extensively Bassiouni, *A Functional Approach to 'General Principles of International Law'*, 11 Michigan Journal of International Law No. 3 (1990), 768-818 (individuating at least four functions that the legal category of 'general principles' may perform, namely: (*i*) source of interpretation; (*ii*) means for developing new norms; (*iii*) supplemental source to positive law; (*iv*) modifier of positive law).

system, be it domestic or international)[857] or may be astracted from existing treaty and customary law. According to such conception – intuitively favored by pure legal positivists –,[858] general principles would be derived from specific rules or complex sets of specific rules; more precisely, they would remain unexpressed (say: *implicit*) until a legal operator *discerns* them. Applying it to MHC, it has been extensively demonstrated that attempts at finding a positive requirement for human presence at each deliberation of using force are doomed for failure: stating that MHC would lay *unexpressed* in existing rules of IHL and IHRL seems but a rhetorical artifice. In our view, such position cannot be supported as it presumes exactly that which it aims to demonstrate.

Conversely, a more promising path appears to emerge from a slightly different understanding of general principles of international law, namely as constituting the international legal order's 'axiomatic premises'[859] or, as others put it, as being 'fixés a priori, presque de manière d'*axiomes*'.[860] Those who adhere to this theory often cite the principles of justice, equity, *bona fides*, territorial sovereignty, equality of States, *pacta sunt servanda*, reciprocity, proportionality.[861] Recently it has been suggested that other principles should be added to the list, as they appear to be corresponding to the international legal order's contemporary structure: namely, the

[857] Ibidem, at 128-129, and references therein.

[858] See ibidem, at 138 ff. (citing as examples: territorial sovereignty, effectiveness, freedom of seas, basic principles of State responsibility).

[859] The expression is quoted from Tomuschat, *International Law: ensuring the survival of mankind on the eve of a new century. General course on public international law*, Recueil de Cours 281 (1999), 9-438, at 161 (arguing that the most prominent of such axiomatic premises undoubtedly is 'sovereign equality of States', regarded as 'the principal Grundnorm of the present-day international legal order'). The notion of 'Grundnorm', first elaborated by Kelsen, is particularly apt for reasoning in terms of 'general principles' as they are conceived of as pointing to supreme values of a given legal order. This intuition will work as polar star of the following analysis.

[860] See Dupuy, *L'unité de l'ordre juridique international, Cours Général de droit international public*, Recueil des Cours 297 (2002), 9–490, at 182, italics added.

[861] For a complete listing of general principles and their corresponding supporters in legal scholarship, references can be found in Pisillo Mazzeschi-Viviani, *General Principles of International Law*, cit., at 128-130 and *passim*.

principles of 'human life and dignity'[862] or 'elementary considerations of humanity'.[863] When discussing this emerging area of general principles of international law, supporters care about evidencing their moral consistency in the first place:[864] as has been aptly remarked, general principles would express the *values* of the legal order they operate within.[865] Emphasis on this feature, however, does not result in legal positivism being completely left out of the picture, as consent (often expressed through the idea of '*recognition*')[866] by the international community as a whole is always maintained in most of the abovementioned theories.[867]

Adopting this viewpoint, there is room for MHC to operate as a general principle of international law. On the one hand, it may be held that as a matter of fact MHC corresponds to an 'axiomatic premise' of the international legal order as it has a self-evident *value-oriented* content: we showed that one particularly convincing understanding of MHC is that it purports to preserve the *dignity* of those who are targeted by LAWS as they

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[862] See Tomuschat, *International Law: ensuring the survival of mankind*, cit., at 355-356 (recalling the *Grundnorm* expression and basing the assumption on the fact that such principle finds expression in the UN Charter as well as in the UDHR).

[863] See Dupuy, *L'unité de l'ordre juridique international*, cit., at 186-187 (tracing this principle's origin back to a sort of social morality and public order).

[864] In addition to the Authors cited previously, see also Cançado Trindade, *International Law for Humankind*, cit., at 496 (stating that international law of the twentieth century was inspired by 'a humanist philosophy' in which general principles played a considerably important role, and arguing that 'its normative content flows from the *conscience* of the members of the international community (and not from their simple acts of will), to respond to their common needs and aspirations, in a manifestation of the *opinio juris communis*').

[865] A value-based approach has been supported with particular regard to the field of human rights law: see De Sena, *Prassi, consuetudine e principi*, cit., at 534 (stressing that IHRL provisions are quite often expressed as 'principles' rather than 'rules' by virtue of their underlying values and their fundamental, axiological character).

[866] See *inter alios* Verdross, *Les principes généraux de droit*, cit., at 536 (speaking in terms of 'reconnaissance expresse' by the international community).

[867] See *amplius* the doctrinal debate recalled in Pisillo Mazzeschi-Viviani, *General Principles of International Law*, cit., at 138 ff.. The Authors further explain the differences between customary law and general principles of internatonal law, which in their view lie in their being: (*i*) more general and vague in character; (*ii*) endowed with more 'elasticity'; (*iii*) characterized by a dimension of 'weight' and 'importance' stemming from their participating to the 'axiomatic premises' of the international legal order.

require human deliberation about the particular release of force. No doubt that MHC would have strong roots in morality. On the other hand, while it may be said that acceptance of MHC as a 'common denominator'[868] in the discussions around LAWS is indicative of its 'recognition' by concerned actors (States and NGOs in first place),[869] at the same time an important issue must not be underestimated: that those actors do not agree on the *same* principle; actually, they understand it in diametrically divergent fashions.[870] According to the theories that have been exposed above, it is true that general principles of international law differ from customs in that they do not depend on general practice and *opinio iuris* as they characterize the latter;[871] rather, they are 'acknowledged', 'discovered' or – more appropriately – made 'discernible' to interpreters.[872] However, one may wonder what is currently being discerned when so distant understandings of the same concept are at stake. As a matter of fact, what seems to be the only fundamental point of the whole discussion on MHC so far is that it is too multiform and open to diverging interpretations to be considered as one.[873]

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[868] See UNIDIR, *The Weaponization Of Increasingly Autonomous Technologies: Considering How Meaningful Human Control Might Move The Discussion Forward*, 2015, at 3.

[869] As perfectly captured at the very beginning of Crootof, *A Meaningful Floor*, cit., at 53: '[t]o the extent there is any consensus among States, ban advocates, and ban skeptics regarding the regulation of [LAWS], it is grounded in the idea that all weaponry should be subject to [MHC]'.

[870] Recall the case of the Russian Federation as explained above.

[871] See *amplius* Pisillo Mazzeschi-Viviani, *General Principles of International Law*, cit., at 132-134, and references therein (arguing that 'the legal force of these principles would not lie in the consistency of practice (and subsequent *opinio juris*), but rather on the strength of States' conviction about the mandatory nature of the same principles' deriving from the 'ethical/legal value of the principles in question', which *de facto* renders practice nothing but 'an additional element demonstrating conviction').

[872] An interesting natural-law theory of general principles has been recently proposed by O'Connell-Day, *Sources and the Legality and Validity of International Law*, cit.: the Authors argue that these principles stem from three strands that have been characterizing natural-law descriptions ab immemorabile, namely reason, human nature and openness to transcendence. The latter is today understood not only from a religious viewpoint, but also from a more secular one, which has its roots in aesthetic and beauty.

[873] Recall the diverging views on MHC as tool for ensuring proper distribution of responsibility and as a tool for preserving human dignity.

In sum, such a lack in *idem sentire* hampers identifing a base of 'recognition' for the purposes of acknowledging MHC as a general principle of international law.[874] This does not imply, however, that current debates on MHC do not have any impact on the nature of that concept. More principled reflection on the *moral* issues involved in autonomous killing, fuelled in particular by experts and civil society representatives,[875] may lead many actors (*in primis* States) to embrace a stronger understanding of MHC. A suggestion may help understand the terms of the questions. According to another well-known theory of general principles, they would operate as a permanent 'converter' of moral imperatives into legal standards.[876] Even assuming that this theory is largely shared (which by the way is not: pure legal positivism would raise a strong objection to it), the problem with MHC would raise *a priori*: what remains unclear in the current discussion is the *very immorality of autonomous killing*. Only when

[874] We share the conclusions put forward by De Sena, *Dignità umana in senso oggettivo*, cit., particularly at 583, with respect to a different – but largely overlapping – case. The Author's intention was to demonstrate whether a unitary concept of objective dignity could be drawn from the relevant practice of domestic and international tribunals. Upon taking account of the quite contradictory and inconsistent attitude at referring to an undefined notion of 'dignity', the Author concludes that it is impossible to trace a common denominator endowed with a sufficiently defined and generalized content for the purposes of assessing the existence of a general principle – *recte*, in the Author's words, a 'metaprinciple' capable of being enumerated among the sources of law.

[875] In confirmation of our approach supporting MHC as a general principle of international law a particular circumstance should be taken into account, namely the proactive and precious participation of actors other than States in the debate around LAWS. All the MoE&GGE Sessions that have taken place so far in the framework of the CCW give witness to the essential contribution by NGOs and civil society at large. This is fully consistent with (and actually may one day be taken as an example of) the trend of enlarging the notion of 'international community' so as to include new actors that can play an effective law-making role. See Pisillo Mazzeschi-Viviani, *General Principles of International Law*, cit., at 142 ('the notion of international community should not be limited to States and international organizations but should be understood more broadly, as including non-governmental organizations, individuals, groups of individuals and legal entities, as well as associations or political movements that represent civil society in various ways').

[876] See Pisillo Mazzeschi-Viviani, *General Principles of International Law*, cit., at 130 (stressing that 'these values are not based on natural law, but they find expression in the UN Charter and in the UNDHR; and some of them […] are based on moral principles that may convert themselves into positivist [sic] law').

this moral dimension is clarified a discussion on MHC as a general principle of international law will possibly be fruitful.

4.5.3 MHC qua *Programmatic Principle?*

As already noticed, it is possible to see the debate on MHC through the lenses of the long-standing, never-ending contrast between legal positivism and natural-law theories.[877] Recently, however, it has been proposed that at least some general principles of international law may have only a *programmatic* effect: in short, they would not be binding as such, but rather their widespread acceptance and recognition would be *de jure condendo*.[878]

This category appears to be particularly apt for MHC, as it takes into due account both its openness to moral implications (and so winking at natural lawyers)[879] and its still undefined content (in a way that is acceptable to positive lawyers). As a result of their programmatic nature, however, their main function would be to give impulse to the progressive development of international law: they could eventually become binding (at least) once the moral substratum gets better identified and acknowledged.

As an additional remark, it is argued that even to the most convinced skeptics of LAWS (i.e.: to those who would support a narrow understanding of MHC as being already enshrined in positive law) the

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[877] A solid account of extra-positive law as source of international law is provided for in O'Connell-Day, *Sources and the Legality and Validity of International Law*, cit., particularly at 562-563 ('[t]he nineteenth-century turn to science privileged material evidence. [Natural law] was critiqued as open to subjective conclusions that merely justify the status quo or a judge or theorist's personal interests, owing to the lack of material evidence or objective proof for [its] claims').

[878] This position is expressed and developed in Pisillo Mazzeschi-Viviani, *General Principles of International Law*, cit., at 150-155, who do not conceal that there is 'a wide margin of uncertainty in their identification'. In this category are some principles of international environmental law (such as those of sustainable development, common but differentiated responsibilities, precautions, and 'polluter pays') and others such as human security (by reason of the 'very wide, vague and indeterminate content which is difficult to establish exactly') or the international responsibility of legal persons).

[879] According to Pisillo Mazzeschi-Viviani, *General Principles of International Law*, cit., at 154, such principles are better suitable for reflecting neo-natural law approaches.

concept of MHC appears to be merely *de jure condendo*. It is often referred to as: a 'guiding principle';[880] a principle making the content of a 'new legal norm' that still awaits adoption;[881] an 'emerging notion'.[882] No surprise then that those actors do not cease invoking a binding instrument that prohibits LAWS:[883] a vague notion of MHC – deprived of strong moral, value-oriented foundations – does not suffice *in itself*, but is rather perceived as a principle that could *inspire* developments in positive law.

4.6 Concluding Assessments

Jacques Maritain once famously said: '[w]e agree about the rights but on condition that no one asks us why […] why is where the argument

[880] See Heyns, *Autonomous weapons in armed conflict*, cit., at 70 ('[t]he notion of [MHC] should be developed as a guiding principle not only for the use of autonomous weapons, but for the use of artificial intelligence in general').

[881] See Heyns, *Autonomous weapons in armed conflict*, cit., at 66 ('preventing [long-term use of algorithms] can only be done by adopting a new legal norm').

[882] See Chengeta, *Defining the emerging notion*, cit., *passim*.

[883] Emblematic is the case of NGO Article 36, which just after claiming that the requirement of MHC in weapon systems 'is implicit in existing international law governing the use of force', it asked member States to the CCW 'to negotiate a new international legal instrument that would establish a positive obligation for MHC over individual attacks and by so doing prohibit weapon systems from operating without the necessary human control'; see Article 36's Statement at the 2014 MoE at the CCW, available at: http://www.article36.org/statements/remarks-to-the-ccw-on-autonomous-weapons-systems-13-may-2014/. See also the Report elaborated by Reaching Critical Will, *Autonomous Weapons Firmly on International Agenda*, 2014, available at: www.reachingcriticalwill.org/news/latest-news/8895-autonomous-weapons-firmly-on-international-agenda (arguing that a ban 'is necessary to ensure the retention of [MHC] over targeting and attack decisions, which in turn is necessary to ensure that we uphold the principles of humanity as much as possible in the face of the already existing horrors of war and conflict'); the Report published in 2018 jointly by HRW and IHRC, *Heed the Call. A Moral and Legal Imperative to Ban Killer Robots*, available at https://www.hrw.org/report/2018/08/21/heed-call/moral-and-legal-imperative-ban-killer-robots, particularly at 44-45 (concluding in support of a 'preemptive ban treaty' and arguing that 'dangers to humanity more than justify the *creation of new law* that maintains human control over the use of force and prevents [LAWS] from coming into existence', italics mine).

begins'.[884] Substitute 'the rights' with MHC and the current state of the debate on LAWS gets perfectly depicted.

Many fear that insisting on it may be deleterious in terms of protection of human beings, and therefore reject its being a legal requirement.[885] Importantly, this is the position which as of today is reflected in the (still ongoing) discussions in the CCW forum:[886] taking the most recent GGE Report as example, references to the notion of MHC are totally absent; 'human control' is mentioned only twice, namely when explaining the proposals of a legally-binding instrument and of a political declaration on LAWS.[887] By contrast, all States pay lip service to the importance of retaining MHC over weapons, but substantially diverge on the *meaning* thereof. Broad and narrow understandings of MHC place themselves at the very (opposite) ends of the spectrum, and so do the functions MHC is believed to have.

What has been demonstrated is the following: if (a narrow understanding of) MHC is intended to ensuring a working system of accountability,[888] it does not seem indispensable *as such*; state accountability, for instance, can do without. On the contrary, if the ultimate goal is to retain human deliberation over each application of force against an individual, MHC may have an autonomous *locus standi* in IHL and IHRL. With regard to this peculiar function of MHC, it has been demonstrated that: (*i*) such

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[884] See Maritain, *Introduction*, in UNESCO, Human Rights: Comments and Interpretation, 1949, at 9.

[885] This is the position held by Crootof, *A Meaningful Floor*, cit., at 62 ('[a]ny definition of [MHC] that would prioritize human control at the cost of increased risk to soldiers and civilians must be rejected outright').

[886] As emerges vividly from the Report of the 2015 MoE, available at http://www.unog.ch/80256EDD006B8954/(httpAssets)/587A415BEF5CA08BC1257EE0005808FE/$file/CCW+MSP+2015-03+E.pdf, at 17 ('[MHC] may be useful as a policy approach to address shortcomings in current technology. However, it should not be applied as a legal criterion as this could undermine existing targeting law by introducing ambiguity').

[887] See the August 2018 Report of the GGE, available at: https://www.unog.ch/80256EE600585943/(httpPages)/7C335E71DFCB29D1C1258243003E8724?OpenDocument.

[888] As is in most opinions that international actors and scholarship have expressed so far. See *ex multis* Chengeta, *Defining the notion*, cit., *passim*.

understanding of MHC is grounded in *moral* arguments; (*ii*) translating these arguments into *legal* terms requires an additional effort, as MHC is not enshrined as such in treaty and customary law, and may stand as a general principle of international law applicable to the use of force on condition that its meaning and its purpose are clarified.

In sum, it appears that according to the current state of the debate MHC works as a *de jure condendo* principle: a programmatic one, which should inspire developments in positive law – namely, a treaty prohibiting LAWS lacking MHC over particular use of force. It has been shown that also those who contrast these weapons do not cease invoking an *ad hoc* treaty, as though moral imperatives – taking the shape of 'principles of humanity' and 'dictates of the public conscience' (as per IHL) as well as of the principle of 'human dignity' (as per IHRL) – were not sufficient as such to legally proscribe a weapon. One could read between the lines and conclude that legal positivism has (once again) triumphed on natural-law theories.

In our view, a partially different reading is preferable. General principles of international law are the legal category which MHC best fits in. Imbued as they are with moral aspirations, they aptly capture the essence of a notion such as that of MHC in its narrowest meaning. However, the understanding thereof are so diverging that as of today it is not feasible to consider it as a general principle of international law: there simply is too much disagreements among involved actors. This leads us to conclude that what is really needed now is a more *principled* discussion on it: that States, NGOs and civil society engage in understanding which *values* MHC is aimed at serving.[889] Only by reasoning in terms of values the discussion will move forward, and MHC will begin to operate as a general principle of

[889] Academic reflection on general principles of law in general (and of international law in particular) attaches great importance to reasoning in terms of values. See *amplius* Pisillo Mazzeschi-Viviani, *General Principles of International Law*, cit., at 156 ('a non-traditional foundation, consisting of the recognition by the international community *lato sensu* of certain meta-juridical values has been added to the traditional foundation …. In other words, besides the 'rules' dimension, the 'values' dimension has also been established, or at least strengthened').

international law endowed with binding effect. It is time to get over Maritain's disillusion.

Conclusion

SUMMARY: 1. Outcomes of the Present Research. – 2. The Logic of Algorithms and the Logic of Dignity. – 3. Asymmetry in Humanity.

What is man that you are mindful of him,
and the son of man that you care for him?
(Psalm 8, 4)

1. Outcomes of the Present Research

Our approach to LAWS has been purely legal: we tested the way they will foreseeably operate through the lenses of IHL and IHRL. It is now time to recollect and summarize our main findings with a view to proposing a critical approach to the issue.

First, the rules we considered under IHL and IHRL have turned out to be construed and interpreted as intrinsically *context-related*. Use of force against individuals in armed conflict and law-enforcement situations is subject to different principles whose aim has historically been – and still today is – to *limit* and *rationalize* harmful consequences thereof.[890] Thus attention is focused mostly on *the way* force is actually employed against a particular target (an individual or group of individuals): it must be discriminatory, proportionate, resulting from a precautionary analysis of the circumstances.[891] It follows that in order for LAWS to be applied

[890] See for IHL the rules of: SIrUS (2.2.2); prohibition of indiscriminate weapons (2.2.3); distinction (2.3.2); proportionality (2.3.3); precautions in attack (2.3.4). For IHRL, see legality (3.3.2.1); necessity (3.3.2.2); proportionality (3.3.2.3); the positive duty of precaution regarding the choice of weapons (3.3.3.1).

[891] Rules applicable to the use of force vary depending on the branch of law under consideration: it is argued that IHL allows for wider resort to force, whereas IHRL rules are more stringent.

consistent with existing IHL and IHRL, it is *only* required that their use abide by the abovementioned rules: *nihil pluris*.

Second, our analysis would have been incomplete if it did not turn to the principle of *humanity* and of *human dignity* inasmuch as core provisions of IHL and IHRL respectively.[892] The issue at stake is a key one, as by recognizing them a normative role they might lead to considering LAWS as already proscribed by existing law. We adhere to the legal theories according to which these principles do effectively play a normative role, for at least the following reasons: (*i*) the *history* of such principles (such as the Martens Clause) witnesses to the need for going beyond mere written law;[893] (*ii*) the *theoretical reflection*, especially when it comes to general principles of international law, accepts them as an independent legal source;[894] (*iii*) their *practical application* acknowledges them such role.[895] Some place the debate around the legal status of such principles in the dichotomy between positive law and natural law.[896] In our view, appealing to this dichotomy risks being counterproductive, as a correct understanding of the legal category of principles can reconcile the two opposite approaches. From the positive-law angle, these principles still require *opinio juris* and practice, though to a different degree than customary law.[897] From

[892] See Chapter II (2.5) and Chapter III (3.4).
[893] See Chapter II (2.5.1).
[894] See Chapter III (3.4.1) and IV (4.5.2).
[895] See case-law cited and commented in Chapter IV (4.5.2). See *amplius* De Sena, *Prassi, consuetudine e principi*, cit., *passim*.
[896] See Cassese, *The Martens Clause*, cit., at 40; O'Connell-Day, *Sources and the Legality and Validity*, cit., *passim*; Pisillo Mazzeschi-Viviani, *General Principles of International Law*, cit., at 137 and *passim*.
[897] See for instance Pisillo Mazzeschi-Viviani, *General Principles of International Law*, cit., at 143 (discussing general principles of international law and arguing that they are 'based on general consensus by the international community *lato sensu*', do not need *diuturnitas*, at least if it is understood in the classical sense as a "material" practice and not as a "verbal" one', and '[a]s for *opinio juris*, one could perhaps argue that this element also operates in these principles, provided it is understood as recognition of the mandatory nature of the principles, and not in the traditional sense as recognition of the legal nature of an inter-State practice').

the natural-law angle, they conveniently translate moral imperatives and basic values into law.[898]

Third, we conceded that although it is possible to attribute principle of humanity and human dignity such a normative role, a clear *understanding* of these principles is needed – *and it is precisely what current discussions on LAWS seem to lack*. This circumstance stems evidently from the contrasting views on MHC. What our analysis of this 'emerging principle' shows is that it is hard to consider it as an independent principle *at all*. Some overtly discard it for its being redundant for, if not deleterious to, a rational employment of force during hostilities and in law-enforcement operations.[899] Most support MHC as it would function as a tool for attributing responsibility, thus avoiding any 'accountability gap'.[900] This is possibly the least convincing argument in our view: we showed that international law – in itself or taking inspiration from other fields of law – can fix the problem of assigning responsibility without resorting to MHC (at least in the narrow understanding we proposed).[901] Only few base MHC on the ground of 'humanity' and 'human dignity'.[902] This is the most principled, and yet the least developed, argument against LAWS.

In conclusion, what is still missing in today's debate on LAWS is a *principled* approach to autonomous killing capable of taking account of the peculiarity of such phenomenon. While it is undeniable that so far IHL and IHRL rules and principles have been addressing *the way* force is applied, time has come to face an unprecedented, but nonetheless urgent, question: does it make a difference if *the one that applies force* in a specific situation is

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[898] Dworkin, *Taking Rights Seriously*, cit., at 22 (contending that principles have a binding nature by reason of their being 'a requirement of justice or fairness or some other dimension of morality').

[899] Crootof, *A Meaningful Floor*, cit., at 62 ('[a]ny definition of meaningful human control that would prioritize human control at the cost of increased risk to soldiers and civilians must be rejected outright').

[900] See Chapter IV (4.3).

[901] See Chapter IV (4.2).

[902] See Chapter IV (4.4).

a *non-human agent*? What follows is more an hypothesis for further research than an actual answer to the question.

2. The Logic of Algorithms and the Logic of Dignity

Most supporters of LAWS avail themselves of a pretty curious equivocation of the term 'humanity', which can be understood both as 'humanity-mankind' and 'humanity-sentiment'.[903] Quite intuitively, 'being part of mankind' is not coincident with 'acting humanely':[904] Hitler was surely a human being, but could hardly be said having behaved humanely for most of his life.

Thanks to this *écart sémantique*,[905] it is easy to argue that what really matters in applying force against an individual, both in armed conflict and in law-enforcement operations, is not the one that applies such force, but rather how it is applied: as long as it is applied *humanely*, one should not care about the nature of the applier – a human agent or a non-human one.[906] Machine can be as 'humane' as humans are – if not *more*.

However, there is another 'gap', or *écart*, that must be taken into consideration, namely what we can call *écart ontologique*, which refers to a radical difference between the logic of algorithmic decision-making and human decision-making. The former is a logic where each step of the sequence is bound to the following in a purely *deterministic* way, and their whole must produce an outcome measured in terms of *efficiency*.[907]

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[903] See Coupland, *Humanity: What Is It And How Does It Influence International Law?*, cit., *passim*.

[904] In English it is possible to appreciate this difference more than in other languages, such as in Italian. In English the adjective 'human' is different from 'humane', whereas the Italian adjective 'umano-umana' means both of them.

[905] See Chamayou, *Théorie du drone*, cit., at 290: the expression could be translated as 'semantic gap'.

[906] *Ibidem*. See also Anderson-Reisner-Waxman, *Adapting the Law*, cit., at 410: '[t]he principle of humanity is fundamental, but it refers, not to some idea that humans must operate weapons, but instead to the promotion of means or methods of warfare that best protect humanity within the lawful bounds of war, irrespective of whether the means to that end is human or machine or some combination of the two'.

[907] See Zellini, *La dittatura del calcolo*, cit., at 15.

Conversely, human decision-making is anchored in the idea of spontaneity, that is *freedom* (of conscience, and therefore of action); what is more, human actions are then evaluated not only in terms of efficiency, but also from a *moral* standpoint.[908]

In our view, instead of asking what algorithms can do, it is maybe more urgent to ask what they *cannot* do – and therefore to address that precise *écart* between the two decision-making processes. Algorithms cannot grasp the *value* of the reality they order: they cannot explain *why* we use them. They see only the means (*rectius*: they *are* the means!) but tell nothing about the ends. They leave out the question on the deep nature of men and of the algorithm itself,[909] or, as has been convincingly argued, the capability of taking one step back from what is deterministically due.[910] Another way to express this *écart* is to acknowledge that humans and machine literally speak *two different languages*.[911]

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[908] See *amplius* our remarks on 'autonomy', *supra* Chapter I (1.2).

[909] See Zellini, *La dittatura del calcolo*, cit., at 19; quoting in full:'[t]utto ciò che fa l'algoritmo lascia fuori di sé una domanda sulla natura più intima dell'uomo e dello stesso algoritmo … [c]i sarà sempre una domanda inevasa sul carattere precipuo della nostra identità e del nostro discernimento').

[910] See Lambert, *Une éthique ne peut être qu'humaine! Réflexion sur les limites des* moral machines, in Doaré-Danet-de Boisbossel, *Drones et 'Killer Robots'. Faut-il les interdire?*, Paris, 2015, 227-240, at 234 (literally: '[c]e qui distingue au fond le décideur humain de la machine, aussi performants et rapide que soient les algorithmes qui la dirigent, c'est cette possibilité de pouvoir toujours prendre une position de recul et de dépassement par rapport au niveau de langage ou de pensée dans lesquels on est confiné'). The Author concludes that narrow MHC is the only viable solution to the moral and legal issue posed by LAWS, and grounds his claim in that what LAWS lack is a true understanding of the values that are at stake with autonomous killing.

[911] This suggestion comes from Zellini, *La dittatura del calcolo*, cit., at 155-156: algorithm's language is 'hidden' and 'inaccessible', and therefore incompatible with human's 'spontaneity' and 'freedom' (which is 'transcendental' as it does not reveal itself in the reality, as Schopenhauer teaches). All the same, according to Lambert, *Une éthique ne peut être qu'humaine!*, cit., at 232, while it is possible to produce a 'formal language' through which algorithms can operate, it is impossible to translate the 'meanings' implied by particular circumstances into such language: '[c]ette "sortie du formel", ce passage de la syntaxe à la sémantique, ne peut être totalement formalisée, ce qui montre les limites propres d'une démarche qui voudrait se limiter, en éthique, à des langages purement formels ou à des algorithmes'.

All this leads us to introduce a third type of 'gap', one which for the purposes of this work is surely the most interesting (and challenging): an *écart juridique*. In the foregoing we shed light on the fact that the rules governing the use of force under IHL and IHRL are context-related: it is implied that in each situation the one that applies lethal force assesses the particular situation and decide how to conduct. The decision-making is inevitably based on *categories*; the point is that in order for them to be IHL- or IHRL-compliant they must be calibrated with regard to applicable rules in a given circumstance.[912] So, *prima facie*, human decision-making and algorithmic decision-making go hand-in-hand, as what is required at this shallow level is to act (and so to decide *a priori*) according to 'categories' – something which is mostly familiar to the language of algorithms.[913] But we saw that law requires *something more*: both IHL and IHRL are grounded on the core principles of 'humanity' and 'human dignity', which cannot be reduced to other rules – hence the *écart*. This is a deep level of semantics that algorithms cannot penetrate: it is the language of values, the 'essential [that] is invisible to the eye'.

As a confirmation to the above, it is interesting to register that the dichotomy between 'big data' and 'law' has been read through the lens of the dichotomy 'predictivity'/'prescriptivity'.[914] According to this view, algorithms – by virtue of their being bound to a deterministic logic – lack the capability of taking decisions in the *real* sense of the term: they are about

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[912] See Brehm, *Defending the Boundaries*, cit., at 45-52: the Author correctly argues that in IHRL there exist a duty to 'individuate' the use of force so that it is applied only against a person that poses an imminent threat of death or serious injury, and that in IHL there is scope for 'categorical killing', which however must respect the duty to take precautions before attacking. As such, it is acknowledged that IHL and IHRL rules are based on the idea of 'categories'; rather the Author disputes the possibility of translating them into algorithms. It is therefore a technological objection we already tackled.

[913] See Zellini, *La dittatura del calcolo*, cit., at 16.

[914] See Della Morte, *Big Data e protezione internazionale dei diritti umani*, cit., at 276. The Author bases his whole analysis of the phenomenon of 'big data' and its implications on international law upon this dichotomy. I have to thank Gabriele for his invaluable suggestions and thought-provoking talk, in late afternoons at the Catholic University in Milan. Without his presence these Conclusions would have been different – another confirmation that determinism is something we humans should keep at large?

numbers, while 'law is about values'.[915] The same holds true for LAWS: they *execute* decisions, but cannot *grasp* the meaning thereof.[916] They understand how humans (i.e.: their potential targets) behave, but cannot fathom the *dignity* they are endowed with.[917] The logic of algorithms (which is *predictive*) is ultimately divergent from the logic of dignity (which is *prescriptive*): in the small (?) *écart* between the two lies the core challenge of autonomous killing.

3. Asymmetry in Humanity.

The advent of LAWS opens up the possibility that particular targeting decisions are taken entirely by non-human decision-makers, which brings about an unprecedented form of asymmetry between the applier and the receiver of force: an *asymmetry in humanity*.[918] On the stage of the battlespace that will come, these *dramatis personae* of new kind will wear two distinct masks: human and machine. The 'other' will no more perceived as another *se*.

In our view this is the ultimate issue of LAWS. Rather than trying to predict whether such 'revolution in military affairs' is truly 'inevitable', it seems more interesting to reflect on the *impact* it is going to have on current understanding of using force against individuals. This is part and parcel of a greater question that concerns the present day, where technological advancements in computation perform to most eyes what can be really

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[915] See Zeno-Zenchovic, *Ten Legal Perspectives on the 'Big Data Revolution'*, Naples, 2017, at 53.

[916] See Zellini, *La dittatura del calcolo*, cit., at 52 (quoting Hermann Weyl, who in 1919 wrote that matematicians 'should at times remember that the origins of things lie in *deeper* layers than those that they can accede thanks to their methods. *Beyond* knowledge gained through particular sciences is the task of *comprehending*', translation and italics mine).

[917] In the *Stories of the Desert Priests* it is explained how the Devil cannot know human thoughts as it is of a different nature, but it can guess them by simply observing how humans move their bodies. *Mutatis mutandis*, the same applies to LAWS.

[918] See Introduction.

called wizarding.[919] Such progress should not be 'demonized';[920] rather, it must inspire a renewed question on *why* its powers are needed in today's society. In the Introduction we argued with Schmitt that *our epoch needs algorithms, and immediately LAWS are here*. So it seems that possibly more than armed drones, LAWS are the veritable 'extraordinary deconstructive tool':[921] in operating as a diaphragm, they interrupt any immediate link between human agency and the particular application of force. Targets remain the sole human presence in the *tragedy* of annihilation:[922] *aloneness* can be fairly said the byproduct of autonomous killing.

The criminalization of the enemy, through which Schmitt read the shift from the old *jus publicum europaeum* to the new *Nomos*, has been fueled by new technologies allowing to project force not only on the earth (the domain of *Behemoth*), but also through the sea (the domain of *Leviathan*) and eventually through the air (the domain of *Ziz*).[923] Today a *fourth* dimension is emerging, one that transcends any conventional repartitions of space, that crosses all of them without ever materializing. It is at least debatable that

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[919] See Zellini, *La dittatura del calcolo*, cit., at 131 (drawing an interesting analogy between delegating functions to a machine and to magic: both are inclined to take everything… 'literally', without ensuring that what is given is what is needed).

[920] Interestingly, as regards computation and algorithms, humans' quest for better capability of calculating reality has traditionally been associated with the idea of *ubris*. In his Ode 11, Latin poet Horatius warns against scanning the tables of Babylonish seers. As the Biblical narration goes, the census that King David wanted to conduct brought about three years of plague for Israel. Being capable of enumerating things can push humans over the edge, as they mistakenly believe that they have understanding of (and thus power on) reality.

[921] See Vegetti, *L'invenzione del globo. Spazio, potere, comunicazione nell'epoca dell'aria*, Turin, 2017, at 163. According to the Author, the use of armed drones results not only in the possibility of neutralizing regulatory principles of public international law, but also in warfare losing every dimension of 'justice': 'nothing associates the opposing sides, nothing keeps them together, nor it contains them – neither space, nor rule, nor limit]…] Localizing relationships of friend/enemy, using space (here/there) to regulate conflicts, producing legal-spatial forms of reciprocity […] is impossible if a measure capable of de-fining polemical relations disappears', translation mine.

[922] See Chamayou, *Théorie du drone*, cit., at 293 ('[l]e paradoxe est qu'à la rigueur […] le seul agent humain directement identifiable comme étant la cause efficiente de la mort serait la victim elle-même, qui aura eu le malheur, par les mouvements inappropriés de son corps […] d'enclencher à elle seule le mécanisme automatique de sa propre élimination').

[923] See Vegetti, *L'invenzione del globo*, cit., at 20-21.

current processes of criminalization should go through the imperious, impenetrable and unwavering algorithms of *Golem*.

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