ARTIFICIAL INTELLIGENCE, ARMED CONFLICT, CATHOLIC THEOLOGICAL ETHICS

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Abstract

Artificial intelligence provides the complex software for autonomous weapons, a new contribution to the arsenals available for contemporary and future armed conflict. This paper first provides an overview of Catholic Theological Ethics, including the Just War Doctrine, Christian Pacifism, and the priority for peace. In the second part, the paper provides a brief introduction to autonomous weapons, using two examples. In this part, autonomous weapons are linked to the Just War Doctrine, and to the question of responsibility. The third part of the paper brings these two topics together. The third part includes an insight into the ways the Just War Doctrine is challenged by autonomous weapons and the need for respectful dialogue between ethicists and developers of weapons, and the priority of peace. No final conclusion is possible: this is a field of constant change and interchange. But during this work in progress, we can be attentive to the challenges to Catholic Theological Ethics, and to the contributions of Catholic ethicists and Vatican officials.

Keywords: Armed Conflict; Artificial Intelligence; Autonomous Weapons; Christian Pacifism; International Humanitarian Law; Just War Doctrine; Justice; Lethal Autonomous Weapon System; Peace; Principle of Proportionality

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1. Introduction

The contemporary development of Artificial Intelligence has given both beneficial and harmful outcomes for humanity. Recognising the benefits and protecting against potential harms is critical for human flourishing. Here the contributions of theology and ethics are vital. This paper examines one implementation of Artificial Intelligence, in the development of lethal autonomous weapon systems, in the light of Catholic Theological Ethics.

The paper is in three parts. The first part provides an overview of Catholic Theological Ethics, including the Just War Doctrine, Christian Pacifism, and the priority for peace. The traditional doctrine of the Just War has an important place in Catholic theology, and this paper examines how that doctrine might be challenged by autonomous weapon systems. Issues will be discussed including the principle of proportionality, the principle of distinction, and human responsibility and accountability. The traditional doctrine of the Just War does not stand alone in Catholic theology. It is a component of a theology of peace—not just the absence of war, or a balance of terror, but of a peace which comes from God. Is it possible to assess autonomous weapon systems from this standpoint? The topic is of interest in our global Church, and we can access some recent Vatican documents and statements as part of this examination.

The second part provides a brief introduction to Lethal Autonomous Weapon Systems, using two contemporary examples. In this part there will be a link to the Just War Doctrine, and to the particular question of responsibility.

The third part of the paper brings these two topics together. The third part includes a section on the need for respectful dialogue between ethicists and developers of weapons, and the priority of peace. The insight provided by Catholic Theological Ethics recognises the potential for service to humanity that comes with Artificial Intelligence. But the possible capacity for harm by autonomous weapons systems needs to be closely examined. That examination should not place in a closed circuit where Catholic Theological Ethicists talk only to each other, but in the marketplace of ideas and including scientists, engineers, as well as ethicists from varying traditions.

2. Catholic Theological Ethics and Armed Conflict

2.1. The Just War Doctrine

The Just War Doctrine has a long history,[1] but for this short article we can simply summarize. The dominant Catholic ethic governing the conduct of armed conflict has been the Just War Doctrine. With its origins in Hellenic thought, and developed over centuries by luminaries including St Augustine and St Thomas Aquinas, the Just War Doctrine has recognised war as a major evil, but teaches that, under certain conditions, it is not always a sin to wage war. The Just War Doctrine has been included in the 1992 *Catechism of the Catholic Church*, and while aware of the history, we can take the *Catechism* as a convenient starting point. Although the relevant sections are rather long, it is useful to read them together:[2]

> 2307: The fifth commandment forbids the intentional destruction of human life. Because of the evils and injustices that accompany all war, the Church insistently urges everyone to prayer and to action so that the divine Goodness may free us from the ancient bondage of war.

> 2308: All citizens and all governments are obliged to work for the avoidance of war. However, "as long as the danger of war persists and there is no international authority with the necessary competence and power, governments cannot be denied the right of lawful self-defense, once all peace efforts have failed."

> 2309: The strict conditions for legitimate defense by military force require rigorous consideration. The gravity of such a decision makes it subject to rigorous conditions of moral legitimacy. At one and the same time:

> - The damage inflicted by the aggressor on the nation or community of nations must be lasting, grave, and certain;

> - All other means of putting an end to it must have been shown to be impractical or ineffective;

> - There must be serious prospects of success;

> - The use of arms must not produce evils and disorders graver than the evil to be eliminated. The power of modern means of destruction weighs very heavily in evaluating this condition.

> These are the traditional elements enumerated in what is called the "just war" doctrine. The evaluation of these conditions for moral legitimacy belongs to the prudential judgment of those who have responsibility for the common good.

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[1]Seth Lazar and Helen Frowe, ed., *The Oxford Handbook of Ethics of War*, Oxford: Oxford University Press, 2018, especially Part 2.

[2]*Catechism of the Catholic Church (Official Edition for Australia and New Zealand)*, Homebush: Society of St Paul, 1994.

The Catholic ethicist will also take into account *The Compendium of the Social Doctrine of the Catholic Church*, where some of the limitations on waging war are further emphasised.[3] Paragraph 500 again sets out the Just War Doctrine, citing the *Catechism*. Paragraph 501 provides further detail about the role of international organisations such as the United Nations as being appropriate decision makers for entering into war.

The Just War Doctrine is given support by the existence of broadly similar traditions in many religious traditions and cultures. The Doctrine also underpins the contemporary Law of Armed Conflict and International Humanitarian Law, but the Doctrine is not identical with these.[4]

2.2. Christian Pacifism

Although the Just War Doctrine continues to be the dominant ethic guiding Catholic practice, it is not the only position open to Catholics. Christian pacificism has been part of the tradition of the Catholic Church. Christian Pacifism rejects the use of violence as a means of solving conflicts. The condemnation of war, not just as an evil, but totally, is grounded in the life of Christ. The possibility for Christian Pacifism is recognised in paragraph 2306 of the *Catechism*:

> Those who renounce violence and bloodshed and, in order to safeguard human rights, make use of those means of defense available to the weakest, bear witness to evangelical charity, provided they do so without harming the rights and obligations of other men and societies. They bear legitimate witness to the gravity of the physical and moral risks of recourse to violence, with all its destruction and death.[5]

The continuing text, which incorporates the Just War Doctrine, indicates that Christian Pacifism is a respected option, but not an ethical obligation.

2.3. Contemporary Objections to the Just War Doctrine

While accepting that the Just War Doctrine might have been accepted in the past, there are contemporary objections to the doctrine. Three can be mentioned here.

1. The doctrine of the Just War includes the notion that the use of arms must not produce evils which are greater than the evils to be eliminated: this is the principle of proportionality. Some Catholic

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[3]Pontifical Council for Justice and Peace: *Compendium of the Social Doctrine of the Church*, London: Burns and Oates, 2005.

[4]David Luban: "Just War Theory and the Laws of War as Nonidentical Twins," *Ethics and International Affairs* 31, 4 (2017) 433-440.

[5]*Catechism of the Catholic Church.*

ethicists argue that because of the devastation caused by nuclear weapons, or even conventional weapons, there can no longer be any "Just War."

2. The doctrine of the Just War incorporates the distinction between combatants and non-combatants. Unless artificial intelligence can be programmed to make this distinction, the doctrine cannot effectively apply.

3. The doctrine of the Just War is based on the assumption that wars will be fought between organised armed forces with a responsible leadership. In the absence of an authority to authorise a war, the doctrine cannot effectively apply. Modern armed conflict is often between informal militias and states, or between militias who have no authority structure to authorise war. For this reason, contemporary usage in law prefers the term "armed conflict" to "war," because there may not be any formal war.

2.4. Priority for the Promotion of Peace

An important theme at the core of Catholic theological ethics is not simply the minimisation of the evils of war: the promotion of peace takes priority. The *Compendium of the Social Doctrine of the Church* quotes Saint Pope Paul VI to remind us that "Peace is a value and a universal duty founded on a rational and moral order of society that has its roots in God himself, "the first source of being, the essential truth, and the supreme good." The *Compendium* also reminds us that "everyone is responsible for promoting it". This is a moral duty on all human beings.[6]

In contemporary terms, we must examine how Artificial Intelligence can be harnessed to that "universal duty" in the moral order of society: the peace which is the fruit of justice and love, and whether Autonomous Weapons can accord with that duty.

3. Artificial Intelligence and Autonomous Weapons

In 2012 the U.S.A. Department of Defence defined an autonomous weapon system 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.[7]

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[6]Pontifical Council for Justice and Peace, *Compendium of the Social Doctrine of the Church*, Para 408, 494.

[7] Department of Defence, *Directive: Autonomy in Weapon Systems,* 2012, https://fas.org/irp/doddir/dod/d3000_09.pdf

There is debate about the exact definitions of automated, semi-autonomous, and autonomous weapons system.[8] This debate is not covered in this paper.

It is not so long ago that autonomous robots belonged to the realm of science fiction. In 1942, in a short story *Runaround*, science fiction writer Isaac Asimov developed his Three Laws of Robotics. The first law is "A robot may not injure a human being or, through inaction, allow a human being to come to harm."[9]

Let us take an example. The South Korean *Super aEgis II* automated gun turret is designed to fire automatically when its sensors detect a human being in the Korean Peninsula's demilitarized zone. The automated gun turret, which has been exported, operates from a fixed location, but it would be relatively easy to mobilise, so that it could hunt for prey.[10] It is specifically designed to kill or injure human beings. This is far from Asimov's "Laws of Robotics."

Research on automated weapons systems has already produced weapons that are still controlled by a human operator. A simple robot can go ahead of troops, and open doors. Others can detect and clear land mines or improvised explosive devices. Automated, un-manned weapons systems are already developed for land, sea, and air. And claims are being made for weapons that are fully autonomous. Manufacturers of the Israeli "Harpy" advertise their product as a fully autonomous weapon, with missile and radar sites as its targets.[11]

Many advantages are proposed for autonomous weapon systems. Such a weapon never sleeps, and cannot be suborned. Such a weapon can be located in places where human operators might be at risk, or places where the terrain is too difficult for humans. One author has suggested that India's rugged terrain provides positive arguments for the introduction of weapons guided by artificial intelligence.[12] The

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[8]Alan Backstrom and Ian Henderson: "New Capabilities in Warfare: An Overview of the Contemporary Technological Developments and the Associated Legal and Engineering Issues in Article 36 Weapons Review," *International Journal of the Red Cross* no. 886 (August 2012), https://international-review.icrc.org/sites/default/files/irrc-886-backstrom-henderson.pdf

[9]Isaac Asimov, "Runaround," *I, Robot* (*The Isaac Asimov Collection ed.*), New York City: Doubleday, 1950, 40.

[10]Dodaam Systems Ltd, *Combat Robot (Lethal)* (undated), http://www.dodaam.com/eng/sub2/menu2_1_4.php

[11] Israel Aerospace Industries, *Harpy: Autonomous Weapon for All Weather,* (undated), https://www.iai.co.il/p/harpy

[12]R Shashank Reddy, *India and the Challenge of Autonomous Weapons*, Washington, D.C.: Carnegie Endowment for International Peace, 2016.

state wielding these weapons is not risking the lives of its own troops. Another advantage is that the cost of autonomous weapons may be much less than for weapons with a human operator. And autonomous weapons may be quicker at making decisions than human operators. All of these advantages mean that we can expect increasing development towards greater autonomy and greater use of artificial intelligence in weapons systems. In addition, proponents may argue that research on weapons systems can produce results which are beneficial in civilian operations.

There is no clear dividing line between civilian and military uses for artificial intelligence.[13] This overlap between civilian and military uses has its own phrase: "dual use." The same principles apply to an autonomous drone capable of undertaking military tasks on its own, and an autonomous drone capable of delivering parcels in a civilian context. An autonomous road delivery vehicle must be able to detect a child on a bicycle near the roadway, and anticipate what the child might do. An autonomous weapon system must determine whether an armed intruder is a hostile combatant or a farmer hunting rabbits, and anticipate what the farmer might do. Similarly, "dual use" also occurs for chemical and biological substances which have peaceful uses but which can also be weaponised. This overlap enables us to draw on experience with chemical and biological weapons, but the topic is large and beyond the scope of this paper.

Some weapons systems have been banned by the international community. Anti-personnel land mines are very simple automated weapons: there is no human operator, and land mines automatically detonate when someone steps on them. These weapons have been banned.[14] However, the campaign to ban land mines lasted for decades, and eventually only included anti-personnel mines. Moreover, some countries refused to accept the ban. While that campaign for banning land mines provides a precedent for banning lethal autonomous weapons, it certainly does not predict success.

4. Artificial Intelligence and Catholic Theological Ethics

Catholic ethicists are alive to the need to attend to Artificial Intelligence. The Pontifical Academy of Science has convened conferences on Artificial Intelligence. The Academy for Life has

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[13] Mary Cummings, *Artificial Intelligence and the Future of Warfare*, London: Chatham House, The Royal Institute of International Affairs, 2017.

[14] The Anti-Personnel Mine Ban Convention (Ottawa Treaty), https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/INTRO/580

called for "algor-ethics": an ethic for Artificial Intelligence.[15] But the Rome Call for algor-ethics does not alert its hearers to the particular problems of autonomous weapons.

The Holy See, and individual Catholic ethicists, have been active in discussions about autonomous weapons. In 2016, Archbishop Ivan Jurkovič, as the Permanent Observer of the Holy See to the United Nations and other International Organizations in Geneva, Switzerland, addressed an Informal Expert Meeting on Lethal Autonomous Weapon Systems (CCW).[16] He was particularly concerned about the arms race in autonomous weapons, and took the view that banning these weapons—a policy of prevention—seems to be the best approach. The Geneva-based "Caritas in Veritate Foundation" has published a useful working paper which includes a variety of responses by the Holy See.[17]

4.1. Autonomous Weapon Systems and the Just War Doctrine

The Just War Doctrine articulated in the *Catechism* does not include a relatively recent development in international theory. The traditional doctrine examines justice in two categories: *jus ad bellum* (the decision to go to war), and *jus in bello* (the decisions of combatants on how to act). Modern experience suggests a third category: *jus post bellum* (justice in decisions after the war). Catholic Theological Ethics can usefully incorporate this third category.

One of the reasons why the *post bellum* category needs to be included is that weapons may have no algorithm to tell them that a truce has been declared, or a war ended. Land mines keep on killing and maiming innocent people long after wars have ended. Autonomous weapons can likewise keep on killing and maiming after a war has ended.

4.2. Artificial Intelligence and Responsibility

Discussions of autonomous weapons systems include the question of human responsibility. Since the weapon is programmed to operate autonomously, there is no immediate human decision or action to use

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[15]Academy for Life, *Rome Call for AI Ethics* (2020), http://www.academyforlife. va/content/dam/pav/documenti%20pdf/2020/CALL%2028%20febbraio/AI%20Ro me%20Call%20x%20firma_DEF_DEF_.pdf

[16]Vatican Radio, "Permanent Observer: Autonomous Weapons bring False Security" (11 April 2016), http://www.archivioradiovaticana.va/storico/2016/04/11/ permanent_observer_autonomous_weapons_bring_false_security/en-1221901

[17]Alice de La Rochefoucauld and Stefani Saldi, ed., *The Humanization of Robots and the Robotization of the Human Person: Ethical Reflections on Lethal Autonomous Weapons Systems and Augmented Soldiers,* Chambesy: Caritas in Veritate Foundation, 2017, www.fciv.org/downloads/WP9-Book.pdf

the weapon.[18] The original programming may have begun in a different time, far removed from the scene of armed conflict. Where the users of the autonomous weapons are an organised military force, then it may be possible to probe responsibility up the chain of command, but command responsibility might not be clear. And command responsibility is diffuse in militia-style organisations where decision making is loose and disorganised.

Because of this difficulty, there are advocates of "meaningful human control" which prevents autonomous weapons systems from being fully autonomous. In popular terms, this means having a semi-autonomous system with a "person in the loop." The International Committee of the Red Cross, which undertakes a role as the guardian of international humanitarian law, names the provision of meaningful human control as a fundamental issue for autonomous weapons systems.[19] While law and ethics need not be identical, the provision of human control applies in both fields.

Catholic moral anthropology in its simplest form, focuses on the responsibility of the individual person.[20] Our responsibility is individual, not collectively as a tribe or a family or army or other social unit. At the same time, Catholic moral anthropology also recognises that we are not simply isolated individuals, relating only to God. We also relate to one another, and to God as God's people. In what circumstances can our participation in regimes which establish autonomous weapons systems can give rise to individual responsibility? A scientist or engineer as participating person might be removed from the immediate action to prepare or activate the system, and yet be individually responsible for her part in the programme. Our tradition also condemns not only actions which are morally wrong, but also failure to do good.[21] The combination of the two factors—individual responsibility and failure to do good—provides a framework for allocation of responsibility. If the creators of autonomous human weapons fail to provide meaningful human control, this could amount to failure to do good.

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[18] International Committee of the Red Cross, *Autonomous Weapon Systems: Technical, Military, Legal and Humanitarian Aspects,* Geneva: International Committee of the Red Cross, 2014.

[19] International Committee of the Red Cross, *Ethics and Autonomous Weapon Systems: An Ethical Basis for Human Control?* Geneva: International Committee of the Red Cross, 2018, https://www.icrc.org/en/document/ethics-and-autonomous-weapon-systems-ethical-basis-human-control

[20] *Catechism of the Catholic Church*, 1735.

[21] *Catechism of the Catholic Church,* 1039.

In addition, Catholic moral anthropology does not give human status to machines: a machine can never become a truly morally responsible agent. Algorithms themselves may not be morally neutral. An algorithm can be set to make choices which favour certain values over others, and certain humans over others.[22]

4.3. Catholic Theological Ethics in a Technically Plural World

Catholic ethicists have sought to cross cultural boundaries—such as boundaries with other religions or secular beliefs. But sometimes it seems that there is a boundary—almost an abyss—between ethicists on the one hand and the scientists and engineers who are responsible for the design and the algorithms which make fully autonomous weapons possible.

There are attempts to bridge the gap between science and ethics. In 2002, the States Party to the Biological Weapons Convention proposed a novel approach: States were to work together to develop a Code or Codes of Conduct for Scientists, to support the limitations on biological weapons. This work was to begin in 2005. The success of this ethical initiative has yet to be assessed: a proliferation of codes of ethics or codes of conduct does not guarantee that attitudes or practices have really changed.[23] Similarly, outreach to scientists and engineers concerned with artificial intelligence requires a sustained and respectful dialogue.

We can also learn from international humanitarian law. Article 36 of the 1977 Additional Protocol 1 to the 1949 Geneva Conventions establishes a responsibility on states to assess the impact of new or proposed weapons systems in the light of international humanitarian law.[24] Of course, there is considerable debate about the legality of autonomous weapons, and the application of Article 36. Perhaps Catholic theological ethicists can dialogue with scientists and engineers as to the ethical status of these weapons. The process of dialogue need not be as formal as an Article 36 review, but it should be rigorous.

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[22]Kirsten Martin: "Ethical Implications and Accountability of Algorithms," *Journal of Business Ethics,* 160 (2019) 835-850.

[23]*Governance of Dual Use Research in the Life Sciences*, Washington, D.C.: National Academies Press, 2018, available at https://www.interacademies.org/ sites/default/files/ publication/governance_of_dual_use_research.pdf

[24]B. De Vidts, ed., *Weapons and International Rule of Law,* 2017, http://iihl.org/wp-content/uploads/2019/03/Weapons-and-international-rule-of-law_Sanremo-Round-Table-2016-3.pdf

4.4. Priority for the Promotion of Peace

While this paper gives attention to the Just War Doctrine, it is important to remember that the Doctrine does not stand alone. In Catholic Theological Ethics, the Just War Doctrine is only a segment within a wider teaching about peace. Catholic Theological Ethics gives priority to the promotion of peace as a responsibility for all people.

This gives us a standpoint for ethical assessment of autonomous weapon systems which is not merely based on the Just War Doctrine. Archbishop Ivan Jurkovič, addressing the Informal Expert Meeting mentioned above, said:

> We must be concerned about the use of these kinds of advanced weapons. It is clear that investing on sophisticated weapons fails to restore peace... The real fight is the one which will restore justice, respect for human rights, respect for minorities' rights, political participation, and integral development. This fight will not be won with technologically powerful weapons. The use of LAWS [lethal autonomous weapons systems] will only lead to false security and to instability. In any case, it will not establish the conditions for peace.[25]

Peace is not simply the absence of war, nor is it a "balance of terror" achieved by new weapons. It is not obvious that autonomous weapons will bring peace: they are simply another weapon of war.

5. Conclusion

In one sense, there is no conclusion. We are participating in a "work in progress" where technological programmes and ethical reflection are constantly interacting, and constantly entering new areas. But it is possible to draw two provisional conclusions for Catholic ethicists: the first relates to the university duty to work for peace, and the second relates to the growing body of Catholic thought available to decision-makers.

For a Catholic ethicist, weapons of war, and war itself, can only be considered within the prior duty to seek peace which is the fruit of justice and love. Within that prior duty, Catholics have generally found the Just War Doctrine a helpful guide in living a Christian life. However, the Just War Doctrine has limitations, and some of these limitations become more obvious when considering autonomous weapons. Depending on the algorithms, autonomous weapons can

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[25] Vatican Radio: "Permanent Observer: Autonomous Weapons Bring False Security" (11 April 2016), http://www.archivioradiovaticana.va/storico/ 2016/04/11/permanent_observer_autonomous_weapons_bring_false_security/en-1221901

fail to incorporate the principle of proportionality, can fail to recognise the principle of distinction, and can blur the need for responsibility and accountability by human designers, manufacturers, and operators. In each of these areas, there is a challenge to contemporary Catholic Theological Ethics, requiring us to consider whether our current ethics can adequately respond to the inclusion of Artificial Intelligence in weapons systems.

A Catholic Theological Ethicist can be attentive to the growing volume of Vatican commentary on the development of autonomous weapons. The view expressed officially by Archbishop Ivan Jurkovič suggesting that the appropriate response to autonomous weapons systems is to ban them must provide food for thought.

Artificial Intelligence is at a crossroad. This development has a great potential for service to humanity, but the other side of the coin is a new arms race in autonomous weapons systems. The future will require a measured and respectful dialogue between scientists, engineers, and ethicists.