

**The security impacts of lethal autonomous weapons systems**  
**Presentation by Jayantha Dhanapala**

Convention on Conventional Weapons  
Third informal meeting of experts on lethal autonomous weapons systems  
Geneva  
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**Introduction**

Thank you Mr. Chairman for the kind invitation to address this Meeting. I have devoted a large part of my career pursuing the cause of peace and expanding the frontiers of disarmament and so it is with deep satisfaction that I accept this invitation to address this third informal meeting of experts on lethal autonomous weapons systems.

Starting out as a diplomat for Sri Lanka, I took a leave of absence after my term as Ambassador and Permanent Representative of Sri Lanka to the UN Office in Geneva including the Conference on Disarmament, to join the UN Institute for Disarmament Research (UNIDIR) as its Director from 1987-1992. Later in 1998, I was invited by Kofi Annan to be the first UN Under-Secretary-General for Disarmament Affairs, with the mission of re-establishing the UN Department for Disarmament Affairs. I served on SIPRI's governing board for a decade until 2015 and am currently a Distinguished Associate Fellow there.

I am also President of the 1995 Nobel Peace Prize-winning Pugwash Conferences on Science and World Affairs, which is a co-founder of the Campaign to Stop Killer Robots and working to achieve a pre-emptive ban on the development, production and use of what the campaign calls fully autonomous weapons.

**I. How the development and deployment of weapons affects our security**

Throughout the passage of history, the pursuit of war has undergone profound transformations with the introduction of new weapons and strategies influenced by the application of new technology. The invention of gunpowder in China one thousand years ago has had a tremendous impact on the way wars are fought; we see the consequences daily in the use of firearms and explosive weapons. Nuclear weapons were another so-called technological advance in warfare that we are also still trying to deal with possible catastrophic humanitarian, ecological and genetic consequences of its reuse after 1945 with political intent or by accident and by state or non-state actors. Some have described lethal autonomous weapons systems as the third category of weapons to pose a grave danger to human security and to global peace and stability.<sup>1</sup>

As the founder of the World Economic Forum Klaus Schwab notes, the history of warfare and international security is the history of technological innovation, and today

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<sup>1</sup> The comparison in major revolutions in military affairs was first made by Peter Singer. See Peter Singer, *Wired for War* (Penguin Group (USA) Incorporated, 2009), p. 179 and further, notably p. 203.

is no exception.<sup>2</sup> Modern conflicts involving states are increasingly “hybrid” in nature, combining traditional battlefield techniques with elements previously associated with non-state actors. The distinction between war and peace, combatant and noncombatant, is becoming uncomfortably blurry and this is profoundly impacting the nature of national and international security, affecting both the probability and the nature of conflict.

Over the past century an elaborate tapestry of international law, regulations, and machinery has been woven that sets limits on the means and methods of warfare and specific weapons. To constrain armed conflict and law enforcement operations it has established that the use of force should be an option of last resort. Similarly, practices have evolved aimed at pursuing the peaceful settlement of disputes through collective and co-operative security frameworks, some regional.

Due to these and other measures one nation’s security cannot be achieved by causing the insecurity of others. This requires that military expenditure and defence arsenals should be commensurate with the genuine needs of countries.

The CCW uniquely combines the humanitarian strand of international relations with disarmament and arms control. Since 2014, it has grappled with a broad range of concerns raised by the prospect of weapons that, once activated, would select and engage targets without human control. Today, I will focus on the peace and security implications of lethal autonomous weapons systems.

## **II. Security concerns associated with lethal autonomous weapons systems**

In the CCW deliberations to date a number of countries including my own have elaborated particular concern at the possibility that lethal autonomous weapons systems will negatively impact peace and destabilize regional and global security.<sup>3</sup> The most commonly cited security concerns are that these weapons have the potential to:

1. Escalate the pace of warfare and the likelihood of resorting to war, in large part due to the promise of significantly reduced military casualties;
2. Ignite and foster arms races if the possession by some states and not others leads to all feeling compelled to acquire them against the possibility of asymmetric warfare resulting between technological haves and have-nots;
3. Be acquired and used by non-state armed groups, including terrorist entities;
4. Undermine existing law, controls and regulations.

Let us briefly examine each of these key concerns, starting with ever-increasing pace of warfare.

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<sup>2</sup> Klaus Schwab, “The Fourth Industrial Revolution: what it means, how to respond,” 14 January 2016. <http://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond>

<sup>3</sup> Statement of Sri Lanka, CCW informal meeting of experts on lethal autonomous weapons systems, Geneva, 13 April 2015. [http://www.unog.ch/80256EDD006B8954/\(httpAssets\)/30534E70A6CFAAC6C1257E26005F2B19/\\$file/2015\\_LAWS\\_MX\\_Sri+Lanka.pdf](http://www.unog.ch/80256EDD006B8954/(httpAssets)/30534E70A6CFAAC6C1257E26005F2B19/$file/2015_LAWS_MX_Sri+Lanka.pdf)

### *1. Escalate the pace of war and likelihood of going to war*

As the chair's report of the 2015 CCW experts meeting notes, one reason for military interest in autonomous functions is the increasing speed or pace of warfare.<sup>4</sup> This is despite warnings from scientists and others about the risks posed by autonomous systems interacting at speeds beyond human capacities.

A 2013 statement endorsed by more than 270 engineers, computing and artificial intelligence experts, roboticists, and professionals from related disciplines in 37 countries asked how devices made and deployed by opposing forces and controlled by complex algorithms will interact, warning they could “create unstable and unpredictable behavior ... that could initiate or escalate conflicts, or cause unjustifiable harm to civilian populations.”<sup>5</sup>

We are familiar with human error in the handling of technology with catastrophic consequences from tragedies such as Three Mile Island, Chernobyl, Fukushima and Bhopal. Nuclear warheads accidentally have dropped off planes by developed countries with the most sophisticated safety systems in place. Thus accidents from fully autonomous weapons cannot be ruled out.

A new report by the Center for a New American Security on the operational risks associated with autonomous weapons looks at potential types of failures that might occur in completely automated systems, as opposed to the way such weapons are intended to work.<sup>6</sup> The report finds they could be uncontrollable in real-world environments where they would be subject to design failure as well as hacking, spoofing and manipulation by adversaries. The consequences of a failure that causes a weapon to engage an inappropriate target could be far greater with an autonomous weapon, resulting in “fratricide, civilian casualties, or unintended escalation in a crisis.” It finds autonomous weapons have a qualitatively different degree of risk than equivalent semi-autonomous weapons that would retain a human in the loop.

Weapons that have no means of human intervention after initial manufacture and programming—in terms of the use of judgment, discretion or reason—are inherently insecure. The hacking of confidential communications through Wikileaks and other means has so far resulted in acute embarrassment in inter-state relations, but that could be far worse with the introduction of lethal autonomous weapons systems.

In 2014, more than 20 Nobel Peace Laureates including Pugwash issued a joint statement calling for a preemptive ban on fully autonomous weapons, which

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<sup>4</sup> “Report of the 2015 Informal Meeting of Experts on Lethal Autonomous Weapons Systems submitted by the person,” CCW/MSP/2015/3, 2 June 2015. [http://www.unog.ch/80256EDD006B8954/\(httpAssets\)/587A415BEF5CA08BC1257EE0005808FE/\\$file/CCW+MSP+2015-03+E.pdf](http://www.unog.ch/80256EDD006B8954/(httpAssets)/587A415BEF5CA08BC1257EE0005808FE/$file/CCW+MSP+2015-03+E.pdf)

<sup>5</sup> Campaign to Stop Killer Robots, “Scientists call for a ban,” 16 October 2013. <http://www.stopkillerrobots.org/2013/10/scientists-call/>

<sup>6</sup> The report author is Paul Scharre, who served as a US Army Ranger in Iraq and Afghanistan, and co-authored the 2012 Pentagon policy directive on autonomous weapons. Center for a New American Security, “Autonomous Weapons and Operational Risk,” March 2016, p. 12. [http://www.cnas.org/sites/default/files/publications-pdf/CNAS\\_Autonomous-weapons-operational-risk.pdf](http://www.cnas.org/sites/default/files/publications-pdf/CNAS_Autonomous-weapons-operational-risk.pdf)

expressed concern that “leaving the killing to machines might make going to war easier and shift the burden of armed conflict onto civilians.”<sup>7</sup>

Human Rights Watch and others have described “insurmountable legal and practical obstacles” that would likely interfere with holding someone accountable for unforeseeable, unlawful acts committed by a fully autonomous weapon.

At the 2015 experts meeting, the Holy See shared a 10-page paper exploring fundamental ethical questions relating to the use of fully autonomous weapons that found a lack of accountability could promote the use of fully autonomous weapons “because of the impunity they permit.” It concluded, “the risks of deresponsibilization, dehumanization, and depoliticization induced by the use of lethal weapons removed from effective control by men are important enough that we can envisage asking for their prohibition.”<sup>8</sup>

## *2. Proliferation and asymmetric warfare*

The longer lethal autonomous weapon systems go unregulated the greater the risk of their proliferation, especially to non-state actors, increases. This problem is aggravated further when and if such weapons are seen to have essential military benefits.

Who are the “haves” with autonomous weapons technology? An increasing number of states are actively pursuing precursors to fully autonomous weapons and not all are transparent about their plans. Initial research and development has been identified as taking place in at least six countries.<sup>9</sup>

The 2015 open letter calling for a ban that more than 3,000 artificial intelligence and robotics experts signed affirms that, “the key question for humanity today is whether to start a global AI arms race or to prevent it from starting.” Its signatories find that autonomous weapons may not require “costly or hard-to-obtain raw materials” making them likely to become “ubiquitous and cheap for all significant military powers to mass-produce” and to “appear on the black market” and in the hands of terrorists, dictators, and warlords.

To quote further – “If any major military power pushes ahead with AI weapon development, a global arms race is virtually inevitable, and the endpoint of this technological trajectory is obvious: autonomous weapons will become the Kaleshnikovs of tomorrow....Autonomous weapons are ideal for tasks such as

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<sup>7</sup> Signatories include former presidents Lech Walesa of Poland, Oscar Arias Sánchez of Costa Rica, F.W. de Klerk of South Africa, and José Ramos-Horta of Timor-Leste. Other individual signatories include Jody Williams, Mairead Maguire, Betty Williams, Rigoberta Menchú Tum, Shirin Ebadi, Leymah Gbowee, and Tawakkol Karman, who are members of the Nobel Women’s Initiative, a co-founder of the Campaign to Stop Killer Robots. Nobel Women’s Initiative, “Nobel peace laureates call for preemptive ban on “killer robots,” 12 May 2014. <http://nobelwomensinitiative.org/2014/05/nobel-peace-laureates-call-for-preemptive-ban-on-killer-robots/?ref=204>

<sup>8</sup> “The Use of Lethal Autonomous Weapons Systems: Ethical Questions” paper by the Holy See, CCW experts meeting, 16 April 2015. [http://www.unog.ch/80256EDD006B8954/\(httpAssets\)/4D28AF2B8BBBECEDC1257E290046B73F/\\$file/2015\\_LAWS\\_MX\\_Holy+See.pdf](http://www.unog.ch/80256EDD006B8954/(httpAssets)/4D28AF2B8BBBECEDC1257E290046B73F/$file/2015_LAWS_MX_Holy+See.pdf)

<sup>9</sup> US, China, Israel, South Korea, Russia, and the UK

assassinations, destabilizing nations, subduing populations and selectively killing a particular ethnic group.”<sup>10</sup>

The risk of proliferation is far greater now than at any other time in the past as technology is widely shared for commercial as well as military purposes. An arms race that confers advantages on one side over the other is harmful to the common security of humankind. The temptation to use technology already developed and incorporated into military arsenals would be great, and countries would be reluctant to give it up, especially if their competitors were deploying it.

As one delegation noted at the last CCW experts meeting in 2015, the use of lethal autonomous weapons could change not only the way war is fought, but how wars end.<sup>11</sup> If one resorts to lethal autonomous weapons systems what about terminating the conflict? When do you stop? When is a political objective achieved?

Battlefield decisions taken by machines on auto-pilot can thrust nations into wars that they did not anticipate or desire. We can envisage many scenarios whereby a lethal autonomous weapon could sabotage peace deals and gravely endanger ceasefires concluded after painstaking negotiations, for example when they are programmed to activate without detection after such agreements have been concluded. A normal weapon has a measurable time span between its launch and its impact, while a lethal autonomous weapon may not be constrained by any time span from its launch, making its impact timeless.

### *3. Non-state armed groups*

The Middle East, Asia and other regions are experiencing growing political extremism from nationalist groups, ethno-religious movements and other non-state actors for whom international norms are irrelevant. The technology is increasingly within reach with, as one research group puts it, “ever-more advanced drones capable of carrying sophisticated imaging equipment and significant payloads ... readily available to the civilian market.”<sup>12</sup>

The chair’s report of the 2015 experts meeting notes how in future armed conflict, “tactical considerations will require systems to be small, durable, distributable and stealthy” and “these developments could lead to an increased risk of an arms race and proliferation, as smaller systems are more easily acquired by nonstate actors.”<sup>13</sup> It describes how lethal autonomous weapons systems “would be attractive to non-state

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<sup>10</sup> Campaign to Stop Killer Robots, “Artificial intelligence experts call for ban” 28 July 2015. <http://www.stopkillerrobots.org/2015/07/aicall/>

<sup>11</sup> Human Rights Watch and Harvard Law School’s International Human Rights Clinic (IHRC), *Losing Humanity: The Case against Killer Robots*, November 2012. <http://www.hrw.org/reports/2012/11/19/losing-humanity-0>

<sup>12</sup> Remote Control project, “Hostile Drones: The Hostile Use of Drones by Non-State Armed Actors Against British Targets,” January 2016. [http://remotecontrolproject.org/wp-content/uploads/2016/01/Hostile-use-of-drones-report\\_open-briefing.pdf](http://remotecontrolproject.org/wp-content/uploads/2016/01/Hostile-use-of-drones-report_open-briefing.pdf)

<sup>13</sup> “Report of the 2015 Informal Meeting of Experts on Lethal Autonomous Weapons Systems submitted by the Chairperson,” CCW/MSP/2015/3, 2 June 2015. [http://www.unog.ch/80256EDD006B8954/\(httpAssets\)/587A415BEF5CA08BC1257EE0005808FE/\\$file/CCW+MSP+2015-03+E.pdf](http://www.unog.ch/80256EDD006B8954/(httpAssets)/587A415BEF5CA08BC1257EE0005808FE/$file/CCW+MSP+2015-03+E.pdf)

actors, enabling them to create shock and awe, to use them as a force multiplier, and to spare their own fighters.”<sup>14</sup>

#### *4. Undermine existing law*

The introduction and application of lethal autonomous weapons systems to the battlefield has frightening implications for the laws of war, especially proportionality, precaution in attack in the context of other options, accountability, and the important distinction between combatant and civilian, which a programmed robot cannot yet discern. The weapons have the potential to weaken the role and rule of international law and undermine the international security system in the process.

As Special Rapporteur Professor Christof Heyns reminded us in his 2013 report, these weapons “could have far-reaching effects on societal values, including fundamentally on the protection and the value of life” as they would be unlikely to possess qualities necessary to comply with existing international humanitarian law, such as “human judgment, common sense, appreciation of the larger picture, understanding of the intentions behind people’s actions, and understanding of values and anticipation of the direction in which events are unfolding.”<sup>15</sup> The inability of fully autonomous weapons to interpret intentions and emotions would be a significant obstacle to compliance with the rule of distinction.

Heyns identified “built-in constraints that humans have against going to war or otherwise using force” that “continue to play an important (if often not decisive) role in safeguarding lives and international security” particularly “unique human traits such as our aversion to getting killed, losing loved ones, or having to kill other people.”

As it is, human discernment and judgment have been known to be severely impaired or limited by the “fog of war.” A machine will be thrown into a dysfunctional state.

International human rights law considerations also apply at all times to lethal autonomous weapons systems and cannot afford to be ignored, including their potentially impacts on the right to life, the right to bodily integrity, the right to human dignity, the right to humane treatment, and the right to remedy. This year’s report to the Human Rights Council on the proper management of peaceful assemblies finds that, “autonomous weapons systems that require no meaningful human control should be prohibited.”<sup>16</sup>

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<sup>14</sup> “Report of the 2015 Informal Meeting of Experts on Lethal Autonomous Weapons Systems submitted by the Chairperson,” CCW/MSP/2015/3, 2 June 2015.  
[http://www.unog.ch/80256EDD006B8954/\(httpAssets\)/587A415BEF5CA08BC1257EE0005808FE/\\$file/CCW+MSP+2015-03+E.pdf](http://www.unog.ch/80256EDD006B8954/(httpAssets)/587A415BEF5CA08BC1257EE0005808FE/$file/CCW+MSP+2015-03+E.pdf)

<sup>15</sup> Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns for the Human Rights Council, A/HRC/23/47, 9 April 2013.  
[http://www.ohchr.org/Documents/HRBodies/HRCouncil/RegularSession/Session23/A-HRC-23-47\\_en.pdf](http://www.ohchr.org/Documents/HRBodies/HRCouncil/RegularSession/Session23/A-HRC-23-47_en.pdf)

<sup>16</sup> Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns, and Special Rapporteur on the rights to freedom of peaceful assembly and of association, Maina Kiai for the Office of the High Commissioner for Human Rights, A/HRC/31/66, 4 February 2016.  
<https://t.co/hpkjz7CfyV>

The precautionary principle is also relevant to these deliberations.<sup>17</sup> So is the fundamental Martens Clause, which mandates that the “principles of humanity” and “dictates of public conscience” be factored into an analysis of their legality.

#### **IV. Ways to deal with security concerns**

This forum has made a significant start in deliberating the challenges posed by lethal autonomous weapons systems, but its slow pace and lack of a goal has seen it criticized for treading water.<sup>18</sup> Some view the CCW process as prolonging the debate without results while the autonomous systems are weaponized.

A basic flaw in our current approach seems to be the failure to consider the challenges of lethal autonomous weapons systems from the perspective or point of view of a potential human victim especially non-combatant civilians. Sierra Leone is one of few states asking about the implications of a machine being able to take human life.<sup>19</sup> As the World Council of Churches observed at the first CCW meeting on this topic in 2014, “we have heard very little from states who would not be able to acquire these weapons, who are on the receiving end, and already know how these weapons will look and feel.”

You don’t have to imagine a specific country where autonomous weapons could be used. Just look at what is happening in the world today and the scenarios unfortunately come easily. What happens when autonomous attack aircraft replace human drone pilots altogether? Or when police deploy swarms of small drones equipped with less-than-lethal weapons to monitor mass protests? Or when stationary autonomous weapons with sensors are placed along long borders?

Who will be the victims of those weapons? Will they be groups of men and women who have been deemed enemy combatants? Democracy fighters and social justice campaigners? Economic migrants and asylum seekers?

The conflicts burning today in Syria, Yemen and other countries show how the 21st century battlefield is never completely clear or “clean” of civilians. There’s no way to guarantee or ensure the civilian toll will diminish with the introduction of lethal autonomous weapons systems. Saving soldiers’ lives by not placing them at risk means placing civilian lives in harm’s way.

As Heyns notes, “there are also built-in constraints that humans have against going to war or otherwise using force which continue to play an important (if often not decisive) role in safeguarding lives and international security. Chief among these are

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<sup>17</sup> Rio Declaration on Environment and Development, adopted June 14, 1992, U.N. Doc. A/CONF.151/26 (vol. 1), 31 ILM 874, 1992, principle 15. Adopted by the 1992 United Nations Conference on Environment and Development. <http://www.un.org/geninfo/bp/enviro.html>

<sup>18</sup> Statement of the Campaign to Stop Killer Robots, Convention on Conventional Weapons Annual Meeting of High Contracting Parties Geneva 13 November 2015. [http://www.unog.ch/80256EDD006B8954/\(httpAssets\)/192F54E302628EDFC1257F0F005EBAD4/\\$file/2015\\_CCWMSP\\_LAWS\\_Human+Rights+Watch.pdf](http://www.unog.ch/80256EDD006B8954/(httpAssets)/192F54E302628EDFC1257F0F005EBAD4/$file/2015_CCWMSP_LAWS_Human+Rights+Watch.pdf)

<sup>19</sup> Statements of Sierra Leone, CCW informal meeting of experts on lethal autonomous weapons systems, Geneva, 12-16 May 2014.

unique human traits such as our aversion to getting killed, losing loved ones, or having to kill other people.”<sup>20</sup>

The concept of meaningful or appropriate or adequate human control over the critical targeting and attack functions in weapons systems and their use in individual attacks has swiftly acquired currency within this international debate. Many states have affirmed the need to retain human control of autonomous weapons and want to further explore this concept as an approach to tackling future weapons systems.<sup>21</sup>

Germany affirmed last October that the deliberations to date on autonomous weapons show “there is a common understanding that machines should not be allowed to take life-and-death decisions without human intervention.”<sup>22</sup> The “rejection of fully autonomous weapons systems deciding over the use of force against humans without any human intervention” is a key common understanding listed by the 2015 meeting chair’s report.<sup>23</sup>

## Conclusion

Decisions on war and peace are political and security issues requiring serious debate and discussion. By considering these weapons from the perspective of human control we can begin to assert some authority over our future. It is our collective moral and social responsibility to ensure that international law protects humankind.

Our community has a problem with timeliness and responsiveness, as evidenced by the moribund Conference on Disarmament. The CCW proved its relevance by swiftly adopting a discussion mandate on this topic, but there has been little progress beyond carefully and objectively building a base of common knowledge. That’s because we lack a goal to work towards. If this challenge is to remain in the hands of CCW states, states must feel compelled to take bold steps and avoid a disappointing, inadequate response or none at all.

Expectations are riding high. Please treat this meeting’s recommendations to the Fifth Review Conference with an open and constructive mind. Be wary of requests for further study or starting by seeking agreement on transparency measures or best practices. Procrastination is no recipe for action and low expectations make poor standards. No one wants a long, drawn-out, and inconclusive process. Focus on bold measures that can take the CCW forward swiftly towards a solid and lasting outcome.

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<sup>20</sup> Intervention of India, CCW informal meeting of experts on lethal autonomous weapons systems, Geneva, 14 April 2016. Notes by the Campaign to Stop Killer Robots.

<sup>21</sup> Austria, Croatia, Germany, Iraq, Ireland, Japan, Mexico, Netherlands, Poland, Russia, South Africa, and Zimbabwe requested that meaningful human control be part of the deliberations in 2016. Belgium, Colombia, Sweden, and the ICRC affirmed the importance of human control of weapons systems.

<sup>22</sup> Statement of Germany, UNGA First Committee on Disarmament and International Security, New York, 9 October 2015. [http://reachingcriticalwill.org/images/documents/Disarmament-fora/1com/1com15/statements/9October\\_Germany.pdf](http://reachingcriticalwill.org/images/documents/Disarmament-fora/1com/1com15/statements/9October_Germany.pdf)

<sup>23</sup> “Report of the 2015 Informal Meeting of Experts on Lethal Autonomous Weapons Systems submitted by the Chairperson,” CCW/MSP/2015/3, 2 June 2015. [http://www.unog.ch/80256EDD006B8954/\(httpAssets\)/587A415BEF5CA08BC1257EE0005808FE/\\$file/CCW+MSP+2015-03+E.pdf](http://www.unog.ch/80256EDD006B8954/(httpAssets)/587A415BEF5CA08BC1257EE0005808FE/$file/CCW+MSP+2015-03+E.pdf)



In closing, I remind you of the conclusion of the London Manifesto confronting a future of weapons of mass destruction, co-authored by Albert Einstein and the first Pugwash president Lord Bertrand Russell in 1955:

There lies before us, if we choose, continual progress in happiness, knowledge, and wisdom. Shall we, instead, choose death, because we cannot forget our quarrels? We appeal, as human beings, to human beings: Remember your humanity, and forget the rest.<sup>24</sup>

ENDS

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<sup>24</sup> “The Russell-Einstein Manifesto issued in London, 9 July 1955.”  
<http://www.umich.edu/~pugwash/Manifesto.html>