

*Design: an Ethical and Moral Project.
Conscious Intention for the Cybernetician*

Francis Clermont¹

Socrates: But if you act unrighteously and your eye is turned to the dark and godless, then being in darkness and ignorance of yourselves you will probably do deeds of darkness.

Alcibiades: Very possibly.

Socrates: For if a man, my dear Alcibiades, has the power to do what he likes, but has no understanding, what is likely to be the result, either to him as an individual or to the state? For example, if he be sick and is able to do what he likes, not having the mind of a physician- having moreover tyrannical power, and no one daring to reprove him- what will happen to him? Will he not be likely to have his constitution ruined?

Alcibiades: That is true.

Socrates: Or again, in a ship, if a man having the power to do what he likes, has no intelligence or skill in navigation, do you see what will happen to him and to his fellow sailors?

Plato²

The moral principle is this: whoever attempts to tame a part of a wicked problem, but not the whole, is morally wrong. [...] To date, operations research and management science have been largely indifferent to the morality of the profession, perhaps because the profession has not yet

¹ Disclaimer: The views and opinions expressed in this article are those of the authors and do not necessarily represent departmental or Canadian government policy.

² B. M. A. Jowett, *The Dialogues of Plato*, vol. 1, Alcibiades I (Oxford: Oxford University Press, 1953), p. 673.

taken itself seriously. That the profession has a moral problem, nonetheless, there can be no doubt. It might make us look more mature if we began to discuss it.

Charles West Churchman³

Introduction

At the margins of conventional science over the last century, systems thinking is making its way as a recognized new epistemological and ontological tool used within all scientific fields of studies, research, and in policy. Transdisciplinary by nature, systems theory offers huge potentialities on the path of human knowledge. In the last two decades, it has also been making its way in the domain of military organizations, but not without resistance. This intellectual tool, holistic and critical by nature, offers new and radical perspectives in discovering truths about our world, and with it, new methods and ways to better design, intervene and change the observed reality. The resistance it meets is the result of its reflective nature as it provokes the common knowledge and conventions of institutions, as well as their methods of operation.

Relatively new in certain military institutions as part of a professional development toolkit for its senior practitioners to use in planning, in operation, and within the strategic realm, it has yet to be fully recognized within doctrine and practice. The domination of linearity, verticalness, heteronomy, and certainty as the paradigm of a profound organizational culture, leaves small room for formal applications of systems thinking, a paradigm that offers an exact opposite view. Systems philosophy, and design as a specific form and object of its application and operationalization, confers a profound sense of responsibility for the individual who observes and acts. In this sense, conscience and intention are pivotal for soldiers and leaders within organizations, as their function is not only to attain an objective, but it is also, and even more importantly, to understand the ethical and moral impacts their actions can have, as transformational and moral agents within the institution and society.

Following an introductory section on my personal professional development that has led me towards systems thinking, the paper focuses on the exploratory phase of my

³ "Free for All," *Management Science* 14, 4 (1967):B-141-B-146. <http://dx.doi.org/10.1287/mnsc.14.4.B141>

current research on systems thinking and design, and the concepts used as methodological tools of my inquiry.

The first section addresses the issue of cultural changes that are needed in the military institution where anti-intellectualism has too often hindered the efforts in developing intellectual skills, and the general cognitive and ethical development of soldiers.

The paper goes on to explain why a real revolution in military affairs is warranted, one in which domination of behaviorism should be counterbalanced by the cognitive development of soldiers, and where critical thinking, systems thinking, and design can fully flourish.

The next sections of the article pertain to a fundamental aspect that surprisingly has been missing, or at best has been skimmed in military literature concerned with systems thinking and design: the ethical and moral responsibilities incumbent to institutional actors, leaders, designers, and decision makers in military organizations, and as a corollary dimension, the profound moral significance design has.

After analyzing the nature of design and its teleological dimension, the article focuses on the fundamental importance played by values as dynamic vectors of systems, before addressing the current systemic failures and crises, and the need to shift towards a humanist paradigm.

The paper concludes with final thoughts and questions for future research.

From Soft Skills to Systems Thinking

Teaching Senior leaders of the Non-Commissioned Members (NCMs) of the CAF for over a decade has given me many opportunities to use, teach, develop and do research on non- conventional military concepts in order to inculcate such skills and competencies. It has also been an occasion to influence the CAF institution, its organizations, and its members in reforming its education system in favour of the cognitive and ethical development of its members.

In 2006, I gave lectures on Canada's International Military Relations, an opportunity to introduce senior NCMs to the nature and construct of the post-WWII international system, the strategic configuration of our world and its complexities, and Canada's place within it (operations, alliances and coalitions, government policies, Canada's strategic approach, etc.). It was also an opportunity to get the students to see the big picture and the way they, as citizens and soldiers of Canada, are related to other systems (national, international, etc.), and the function and role they play within it as members of the CAF.

In 2007, in parallel to my teaching responsibilities, I started working on a documentary: *The Art of Being a Soldier-Diplomat. The Experience of Canadian Non-Commissioned Members in Cyprus*. Published in 2011, the main focus of this pedagogical and didactical tool is put on the importance of soft skills and non-combat functions (communication, negotiation, mediation, and cultural intelligence) of soldiers within operations.⁴

In 2011 and 2013, I participated in conferences organized by the Canadian Defense Academy (CDA) and affiliate partners where I spoke about my research on soft skills, the development of the *soldier-diplomat* concept, and with it, the profound ethical and societal importance of education, and the importance to develop at the earliest moments in their career cognitive and critical thinking skills.

In 2015, I published an article in which I reiterated the importance of education (through disciplines such as anthropology, psychology, and sociology) for the NCMs functions, with the intent to demonstrate that the general development of soft skills, and their associated competencies, had for a long time been left to the personal will and desire of individuals, sheer luck and statistical probability.⁵

⁴Francis Clermont and André Séguin, "The Art of being a Soldier-Diplomat: The Experience of Canadian Non-Commissioned Members in Cyprus" (Non-Commissioned Members Professional Development Centre, Department National Defence, 2011), video-documentary, 55 minutes.

⁵ Former CWO Necole E. Belanger had this to say about the Professional Development System (PDS) of the CAF: "There is little doubt that strategic CPO1/CWOs exist within the CAF, but these extraordinary leaders come to be more by accident than by design. In order to operate in this uncertain and complex security environment, the CAF must create leaders in the officer and NCM corps who are capable of operating in a strategic setting. Yet, it has failed to consistently produce strategic NCMs who are capable of meeting our future security challenges," Necole E. Belanger, "The Accidental Strategic Chief Petty

In 2014, I had my initial contact with systems thinking and design by reading a paper written by Bill Bentley, Colonel (ret).⁶ From that moment on, while teaching it in our Senior Leadership Programme for Chief Warrant Officers and Chief Petty Officers 1st Class, I started doing research on this fascinating topic and on its design portion for military applications, a topic that had been recently introduced in our programmes, as mandated by the educational specifications of the CAF, as my colleague Robert Lummack explains further in this volume. Within the Senior Leadership Programme material he had initially put together, I joined him by bringing to the table an in-depth and theoretical look into systems theory, system dynamics and causality, diagrammatic language and picturing (Causal Loop Diagrams and feedback loops). I started teaching and lecturing on the topic twice a year in 2015. The mix of theory and problem solving (a design activity) is intended for the institutional leaders to examine the application of systems thinking to military planning and the inherent thought process behind it. It is ultimately intended to give senior NCM leaders, as part of the command team, important tools in order for them to be fully involved in strategic thinking and planning.

A natural continuation of my work on soft skills and the soldier-diplomat concept, systems thinking was a revelation! I had found a family of abstract and critical thinkers that were also looking at the big picture through a microscope!⁷

In 2015-2016, I gave a lecture for the purpose of a CAF international training program on *Ethics, Integrity and the Military Profession*⁸ in which I participated in as an

Officer/Chief Warrant Officer," *Canadian Military Journal* 16, no. 3 (Summer 2016): pp. 66-71. In this vein, and more specifically on the lack of criticism in personnel evaluation reports, and its systemic effects, See: Anthony Robb, "An Unfortunately Popular Aversion to Truthful Feedback within the CAF," *Canadian Military Journal* 15, no. 4 (Autumn 2015): pp. 48-54.

⁶ Bill Bentley, *We Murder to Dissect: a Primer on Systems Thinking and War* (Canadian Defence Academy Press, 2012), p. 68.

⁷ The term "macroscope" is a neologism invented in 1975 by Joël De Rosnay in his will to oppose microscopic views of the world proposed by traditional science dominated by rationalism and positivism. "The macroscope is not a tool like others; it is a symbolic instrument, a group of methods and techniques borrowed from very different disciplines. Obviously, it is useless to try finding it in laboratories or research centres. Yet many today use it in the most various fields. The macroscope can be considered as a symbol of a new way to see, understand, and act." [Free translation from French], in: Joël De Rosnay, *Le macroscope*, (Paris: Éditions Du Seuil, 1975), p. 15.

instructor. Titled *Cybernetics or The Art of Governing Ethically Within the System* (the origin of a title I use in this paper), the lecture I put together introduces notions and concepts of systems thinking to the students (officers and NCOs from different hierarchical levels, trades and environments) through a transdisciplinary approach.

More recently, in October 2015, I had the privilege and honour of being invited to a workshop held at the Canadian Forces College (Toronto) and organized by Philippe Beaulieu-Brassard. I participated in this fascinating two-day workshop surrounded by remarkable people with deep knowledge and great experience with systems thinking and design applied to the military. That same week, prior to the workshop, I had attended a symposium on systemic design for social complexity.⁹ The words of knowledge and wisdom I had had the chance to hear, such as the ones pronounced by Humberto Maturana, Paul Pangaro, and Erik Stolterman, were a revelation for me as they echoed, even more than I had expected, the research direction I was taking, and the ideas I had put together for the talk I was to present to the “tribe” I was about to meet. *A Think Piece on Thinking Peace. Conscious Intention for the Cybernetician*, was my reflection on my new exploratory journey into systems thinking and design that I presented to the group.

A Necessary Change of Culture

Following the Somalia Scandal in the 1990s, one of the key findings of the Inquiry Commission¹⁰ was that the development of intellectual and cognitive skills of officers and NCMs, and with it their ethical and moral development, were overlooked in the training as well as in the professional development system (learning and education). The ensuing recommendations and subsequent forced changes were,

⁸Organized by the Directorate of Military Training and Cooperation, these activities are intended to contribute to Canada’s effort for international peace and security, and to establish bilateral diplomatic partnerships with non-NATO countries.

⁹“Systemic Design: Emerging contexts for Systems Perspectives in Design,” Symposium, Toronto, Canada, October 13-15, 2016, <http://systemic-design.net/rsd-symposia/rsd5-2016/>, Site accessed 25 January 2017.

¹⁰ Commission of Inquiry into the Deployment of Canadian Forces to Somalia, *Dishonoured Legacy: The Lessons of the Somalia Affair*, Report of the Commission of Inquiry into the Deployment of Canadian Forces to Somalia, 5 Vols., (Ottawa: Minister of Public Works and Government Services Canada, 1997), p. 87.

amongst others, the inception of the Defence Ethics Programme in 1997, the creation of the CDA in 2000, and the publication of a doctrinal cornerstone in the modernization of the Canadian POA: *Duty with Honour. The Profession of Arms in Canada*.¹¹ Doing so was the government's desire to uphold distinction in the profession of arms (POA) by promoting ethical behaviour of its members. As underlined in Canadian Armed Forces (CAF) doctrine, ethical behaviour is the cornerstone of leadership and effectiveness, and key to mission success. Within the complex security environment, and within their function as members of the POA as a whole, they must have the ability to think strategically, to be critical thinkers and advisers, transformational agents, and ethical leaders.

For some, this proposal of change towards divergent and critical thinking,¹² and individual empowerment, seems to have too much of a revolutionary twist to it. Accordingly, such a venue is seen as antithetical for the development of the warrior, as it would hinder his fighting spirit. CAF Captain Thomas St-Denis summarized this well in an article published in the Canadian Military Journal in 2004-2005:

Chief among those limits is the necessary restriction of the soldier's freedom to make choices as an individual. Soldiers are required to sublimate in many ways their own individualism for the sake of the group". [...] military success depends on absolute authority being wielded by the leader, and this same absolute authority works strenuously against the idea of encouraging followers to challenge beliefs and values, and to work things out on their own. It also works against the notion of empowering individuals to seek innovative solutions.¹³

¹¹ Chief of the Defence Staff, *Duty with Honour: The Profession of Arms in Canada* (Canadian Defence Academy, Canadian Forces Leadership Institute, Kingston, Ontario, 2003), p. 86.

¹² See Ben Zweibelson in this volume for quadrants of the conceptualization of ontological and social paradigms, and Aaron Jackson's paper for more in depth information on critical thinking and its incorporation into the Australian Defence Force doctrine.

¹³ Captain Thomas St-Denis, "Transformational Leadership: Not for the Warrior," *Canadian Military Journal* 5, no. 4 (Winter 2004-2005): p. 85. This article was written in answer to: LCol Peter Bradley and Dr. Danielle Charbonneau, "Transformational Leadership: Something New, Something Old," *Canadian Military Journal* 5, no. 1 (Spring 2004): pp. 7-14. See also: LCol Rory G. Kilburn, "Transformational Leadership: Part of the Warrior's Arsenal," *Canadian Military Journal* 6, no. 2 (Summer 2005): pp. 81-82. This debate on transformational leadership is the topic of an essay students attending the Advanced

This is in no way specific to the CAF. As underlined further in this volume by Pettit and Toczec, US soldiers are trained to be reductionist. This discourse, still heard today in military organizations throughout the world, fails to recognize the importance of soft skills in today's security environment, and the necessary change such shift imposes on the organizational culture.¹⁴ Critical thinking is perceived as antithetical to organizations. It is perceived as a challenge and a threat to command and leadership. Change and emergence are unwanted. Such an attitude is an impediment to profound transformation, and the necessary institutional change sought by the CAF's doctrine for nearly two decades.¹⁵

Organisations are dominated by behaviourism where human beings are viewed through a mechanistic and functionalistic paradigm.¹⁶ This is especially true in military organisations where obedience, command and control are fundamental for the regulation and direction of the enterprise. In his article, Chris Paparone, further in this series, speaks of the "cyborg-like" approach where soldiers are seen as optimized systems.¹⁷ Within this paradigm, importance is given to possibilities of measuring and

Leadership Programme of the CAF have to write as part of a series of tasks they have to fulfill in order to obtain their MWO qualification.

¹⁴ See Ben Zweibelson, "Blending Postmodernism with Military Design Methodologies: Heresy, Subversion, and other Myths of Organizational Change," *Journal of Military and Strategic Studies* 17, no. 4 (2017) for quadrants of the conceptualization of ontological and social paradigms, and Aaron Jackson's article in this volume for more in depth information on critical thinking and its incorporation into the Australian Defence Force doctrine. Further, Chris Paparone elaborates on the positivist ideology at work in the United States military, a 'social hazard' defined as 'military scientism,' in "Critical Military Epistemology: Designing Reflexivity into Military Curricula," *Journal of Military and Strategic Studies* 17, no. 4 (2017).

¹⁵ Francis Clermont, "The Art of Being a Soldier-Diplomat. From an Implicit Role to an Explicit Function," *Canadian Military Journal* 15, no. 2 (Spring 2015): p. 34

¹⁶ Recent research, according to a newspaper article published in the *New York Times*, highlight the importance for of cross-functional competencies and skills, and experiences as a demonstration of an individual's capability to learn. Such characteristic is key for businesses when choosing to hire their chief executives and corporate leaders: Neil Irwin, "How to Become a C.E.O.? The Quickest Path Is a Winding One," *The New York Times*, September 9, 2016, <https://www.nytimes.com/2016/09/11/upshot/how-to-become-a-ceo-the-quickest-path-is-a-winding-one.html? r=0>, site accessed 25 January 2017. Such an aim is in phase with the will to put better and more emphasis in the general education cursus of soldiers in counterweight to current emphasis put on specialization.

¹⁷ On such "cultural bias" in the profession of arms in the US, see also: Don M. Snider, "Strategic Insights: Whiskey over Books, Again? Anti-Intellectualism and the Future Effectiveness of Army 2025," *Strategic Studies Institute* (February 2016),

quantifying behaviour and to predict outcome. The response to stimuli is either punished or reinforced. Repetition, patterns, and habits are securing and comforting, but they are also dangerous: drill and repetition hinder the learning process and new information is perceived as pure dissonance and as an aggression. According to *Gestalt* theory, such learning processes hinder reaction to new stimuli and new learning process.¹⁸

In order to achieve the educational learning objectives and goals the CAF set nearly two decades ago, its leaders must simultaneously set the environmental and cultural conditions necessary for the normative and cultural shift needed.¹⁹ There is a need to change the institution's *doxa*,²⁰ one in which a profound culture of anti-intellectualism is still present, and with it the negative effects it has on professional development.

http://www.strategicstudiesinstitute.army.mil/index.cfm/articles/Whiskey-Over-Books-Again_2016/02/23, site accessed 25 January 2017. See also: Matthew Cavanaugh, US Army Major, "The Decay of the Profession of Arms", *Foreign Policy* 8, January 2014, <http://foreignpolicy.com/2014/01/08/the-decay-of-the-profession-of-arms/>, site accessed 25 January 2017. See also: Walter F. Ulmer, Jr., "Military Leadership into the 21st Century: Another 'Bridge Too Far?'" *Parameters* 40, no. 4 (Spring 1998); Col. Lloyd J. Matthews (retired), "The Uniformed Intellectual and His Place in American Arms: Part I," *Army Magazine*, Features, 07/01/2002, and "The Uniformed Intellectual and His Place in American Arms: Part II", 08/01/2002

¹⁸ "Gestalt Theory," Adapted from: Debbie Clark, "Instructional Technology Foundations and Theories of Learning," Nada Dabbagh, March 8, 1999. Recent studies in neuropsychology tend to confirm the existence of engrams, memory traces. Cellular networks and memory traces are ideas that have been hypothesized and developed a century ago by Gestalt inventor, Wolfgang Köhler. Also, see: X. Liu, et al., "Optogenetic stimulation of a hippocampal engram activates fear memory recall," *Nature* 484 (2012), DOI: [10.1038/nature11028](https://doi.org/10.1038/nature11028), as referred to in: Mo Costandi, "Light Brings Back Bad Memories," *The Guardian*, 6 April 2012, site accessed 25 January 2017. See also footnote 38.

¹⁹ Clermont, "The Art of Being a Soldier-Diplomat".

²⁰ As understood sociologically by Pierre Bourdieu, *doxa* are misconceptions and inter-comprehensions of members of an institution of reality based on common opinions, beliefs and subjective "truths". These truths, that are products of the institution and that establish a relation of order and of domination, are taken for granted by the agents of the institution who themselves unconsciously participate to the reproduction of such truths- the essence of what Bourdieu calls *habitus*- rather than discussing and contesting them, thus allowing such misconceptions being reproduced and reinforced. This action creates an "absolute form of recognition of legitimacy through misrecognition of arbitrariness, since it is unaware of the very question of legitimacy, which arises from competition for legitimacy [...]" Pierre Bourdieu, *Outline of a Theory of Practice* (Cambridge: Cambridge University Press, 1977), p. 168. For a complementary definition of Bourdieu's *habitus* concept, see Chris Papparone, "Critical Military Epistemology."

Based on experiences of applying strategic non-linear thinking, especially the experience of retired general Shimon Naveh's in introducing Systemic Operational Design (SOD)²¹ to Israeli Defence Force, Ben Zweibelson recently wrote that systems theory "generates strong institutional bias against world views and approaches that generate entirely novel and dissimilar strategies; threatening established doctrine and institutional traditions is quite dangerous."²² Following Michel Foucault, Ben Zweibelson warned that "The emperor might still kill the philosopher even when he provides sound advice if it threatens the institution's core tenets or values."²³

The danger that technical and technocratic groups, in a conservative and reactionary posture, divert, deviate, and try eliminating systems thinking, design, and sense making tools and concepts, is fundamental in better understanding the challenges and menaces encountered by scholars and practitioners pushing for such ideas and practice.²⁴

Countless scientists have seen their "move" ignored or repressed, sometimes for decades, because it too abruptly destabilized the accepted positions, not only in the university and scientific hierarchy, but also in the problematic. The stronger the "move", the more likely it is to be denied the minimum consensus, precisely because it changes the rules of the game upon which consensus had been based. But when the institution of knowledge functions in this manner, it is acting like an ordinary power center whose behaviour is governed by a principle of homeostasis.

²¹As defined and thought within the Senior Leadership Programmes of the CAF, SOD is a method of operational military planning that is inspired by systems theory and post-modern philosophy. It is believed to be better adapted to modern warfare. The design setting is iterative, based on discourse and participation. It is based on each designer's knowledge, experience, and intuition. Less structured, it also deemed less time consuming, and allows flexibility for planners. Clermont, Francis, and Robert Lummack. "Applying Systems Thinking", Lecture and Activity, Senior Leadership Programme, Chief Warrant Officer Robert Osside (Profession of Arms Institute, Royal Military College St-Jean, St-Jean-Sur-Richelieu, 2014).

²²Ben Zweibelson, "Linear and Non-Linear Thinking: Beyond Reverse-Engineering," *Canadian Military Journal* 16, no. 2, <http://www.journal.forces.gc.ca/vol16/no2/page27-eng.asp>, site accessed 25 January 2017.

²³Ben Zweibelson, "Seven design Theory Considerations. An Approach to ill-Structured Problems," *Military Review* 92, no. 6 (November 2012), http://usacac.army.mil/cac2/militaryreview/archives/english/militaryreview_20121231_art013.pdf, site accessed 25 January 2017

²⁴ See: Bernard Stiegler, *Ce qui fait que la vie vaut la peine d'être vécue : De la pharmacologie* (Paris : Flammarion, 2010), pp. 188-191.

Such behaviour is terrorist, as is the behaviour of the system described by Luhmann. By terror I mean the efficiency gained by eliminating, or threatening to eliminate, a player from the language game one shares with him. He is silenced or consents, not because he has been refuted, but because his ability to participate has been threatened (there are many ways to prevent someone from playing). The decision makers' arrogance, which in principle has no equivalent in the sciences, consists in the exercise of terror. It says: "Adapt your aspirations to our ends, or else..."²⁵

The battle is one of ideas and paradigms. It is between a behaviourist approach and a constructivist one, both at work in institutions, but with different appreciation and success. It is education and learning versus repetition and drill. Both approaches can be used. One does not have to exclude the other. It all depends on the intention and the aim pursued.

Variation, adaptation and choice that the aforementioned psychological paradigms represent, are potentialities for organizational development and success. In observing the dynamic of natural systems, such are the lessons the work of biologists Holling and Meffe confirm. In *Command and Control and the Pathology of Natural Resource Management*, the scientists explain that a reduction in variation leads to less resilient systems. The pathology identified by the authors, and their proposed solution, should help us better understand the necessary regulatory adjustments human systems and organizations must also take in order to adapt and survive:

The role of variation in structuring ecosystems and maintaining their resilience, and managing within the constraints of that structure and dynamics, is critical. We must also modify our institutions and policies to recognize the pathology described herein and to root out similar pathologies in institutional and policy behaviours. To ignore this is to

²⁵ Jean-François Lyotard, *The Postmodern Condition : A Report on Knowledge* (Manchester: Manchester University Press, 1984), p. 111. This book was originally written as a report for the province of Quebec Universities council, and published under: Jean-François Lyotard, *Les problèmes du savoir dans les sociétés industrielles les plus développées* (Conseil des universités du Québec, Gouvernement du Québec, 1979), http://www.cse.gouv.qc.ca/FR/Publications_CUniv/, site accessed 25 January 2017.

perpetuate the pathology of natural resource management and place ecosystems and humanity at great risk.²⁶

Such a venture and journey where limits of human understanding push boundaries and challenge the assumptions and the *status quo* of the moment are constants throughout History. Examples of ‘defamiliarization,’ otherwise known as *ostranenie* in arts, are the work of Arnold Schoenberg’s *Chamber Symphony no. 1, Op. 9*. An expression of his need and desire to go above and elsewhere, and to surpass the limits of conventional language of music and that of the aesthetical (and moral) norms of the moment to explore new limits and new realities, when played in Vienna on March 31, 1913, it created a riot, better known as the *Skandalkonzert*. Two months later in Paris, it was Igor Stravinsky’s turn to witness such violent reaction to his artistic novel, now considered a classic: *The Rite of Spring*. The dissonance and unconventional sounds created were unacceptable for the observers, the critics, and the artistic elite of the time. The artists’ surrealist and expressionist desires to brush aside norms and conventions of the time in order to discover something new were rejected by the academia and its traditionalist elite.²⁷ Sound familiar?

Albeit the importance to explain and analyze the toxicity of the *doxa* concerning critical thinking, and the intellectual emancipation of individuals, the following step of inquiry must address the teleological, ethical, and moral dimensions such onto-epistemological, postmodernist, and critical approaches entail. Such a fundamental dimension has not yet been addressed in military literature pertaining to systems thinking and design.

A Revolution in Military Affairs

What is needed in military organizations, as well as within all other human organizations, as writes Jürgen Habermas, is “revolutionary consciousness [in which]

²⁶ C.S. Holling and Garry K. Meffe, “Command and Control and the Pathology of Natural Resource Management,” *Conservation Biology* 10, no. 2 (April 1996): p. 335.

²⁷ Kent Nagano, Inge Kloepfer, *Sonnez, merveilles!* (Montréal : Éditions du Boréal, 2015), p. 370.

On the violent reactions following Stravinsky’s recital in Paris: Ivan Hewett, “Did the Rite of Spring really Spark a Riot?” *BBC*, 29 May 2013, <http://www.bbc.com/news/magazine-22691267>, site accessed 25 January 2017.

emancipated individuals are jointly called to be authors of their destiny.”²⁸ The sociopolitical transformative context, and with it the transformational capacity of citizens- of which are part the soldier-citizens- is a “radically this-worldly politics understands itself as the expression and confirmation of the freedom that springs simultaneously from subjectivity of the individual and the sovereignty of the people.”²⁹ Following Charles Taylor’s idea on the topic of empowerment and legitimation, Habermas reminds us that “autonomy and self-realization are the key concepts for a practice with an immanent purpose, namely, the production and reproduction of a life worthy of human beings”.³⁰ As John Stuart Mill advocated, moral and intellectual human progress is not only the result of instruments of social control such as education, but the result of the free activity of original individuals that have strong personalities.³¹

Mental structures of perception and representation, when receiving stimuli, give form and try to make sense of the reality for the observer. Such a process opens up many possibilities and possible responses. The needed paradigm necessary for such process of empowerment and responsibilities to flourish is that of cognitive constructivism where problem solving, based on insight, is a key tool to help discover the world, and for developing critical thinking skills for the self-regulated learner. Within a phenomenological approach, the automated individual leaves place to the conscious actor.³² In order to achieve such transition, what we can refer to as self-disruptiveness, “one must die to himself.”³³ Doing so allows the individual to forget

²⁸ Jürgen Habermas, *Between Facts and Norms. Contributions to a Discourse Theory of Law and Democracy* (Cambridge: MIT Press, 2001), pp. 468-469.

²⁹ Ibid.

³⁰ Ibid.

³¹ Jean-Marc Piotte, *Les grands penseurs du monde occidental. L'éthique et la politique de Platon à nos jours* (Montréal: Éditions Fides, 1997), p. 419. Following these haecceitic and ontological dimensions of transformational human beings, we could also mention Barruch Spinoza’s *conatus* (one’s inner force and effort to overcome), Nietzsche’s will to power, or Umberto Maturana’s *autopoiesis* (internal evolution, adaption and self-producing capacity of organisms), concepts that can serve to lighten future paths in better understanding and thinking systems and design.

³² Marc Jeannerod, “Conscience de l’action, conscience de soi,” *Revue philosophique de la France et de l’étranger* 129, no. 3 (2004): pp. 325-330, URL: www.cairn.info/revue-philosophique-2004-3-page-325.htm. DOI : 10.3917/rphi.043.0325.

³³ [Free translation from French], originally: “Il faut mourir à soi-même”, in: Raouïl Duguay, “Les oranges sont vertes,” *L’Envers du décor* 4, no. 3 (janvier 1972): p. 7.

what is known in order to approach, without prejudice or preconceptions, new, yet unknown, objects and senses. Only then can something new, something else emerge.

In the world of human beings, where perception and reflection guide actions, freewill, autonomy and consciousness of individuals are *sine qua non* in the capacity and the ability they entail for them to become responsible agents and actors of their own action. Such conditions also allow the agents to recognize and reflect about their own subjectivity, and with it the necessary intellectual posture of consciously breaking free of such biases, without losing one's own individuation, along with the shackles of *habitus* and *doxa*.³⁴

In empowering individuals so they become moral agents, transformational leaders, and cyberneticians - a concept that will be developed hereafter- the organization must also accept the corollary of such empowerment: individual freedom, autonomy to think and to act, and a sense of responsibility. This does not mean putting in jeopardy hierarchy, command and control. Rather, it engages intrinsic motivation of the subordinates. Even though such a change in culture may be perceived by decision makers and elites as revolutionary and antithetical to organizational culture, such a transformation is the condition for more ethical and moral behaviours to unfold within members of the institution, and ultimately for organizational legitimacy and organizational survival. Such change and adaptation is a necessary path to take for organizations. The choice is between resilience and adaptation, or obsolescence and death.³⁵

Cybernetics or the Art of Governing Ethically Within the System

Two millenniums ago, Plato used the term cybernetics (*kubernetes*: a ship's steersman) to define the art of governing as the qualities needed for the steersman of a

³⁴ Bourdieu, *Outline of a Theory of Practice*.

³⁵ The necessary adaption that offers systems thinking for modern military organizations: Lt.Col. Trent Scott, "Adapt or Die. Operational Design and Adaptation," *Australian Army Journal* VI, no. 3 (2009), https://www.army.gov.au/sites/g/files/net1846/f/aaj_2009_3.pdf, site accessed 25 January 2017. This special edition of the journal, as its title suggests, "The Adaptive Army", focuses on the profound cultural and organizational changes the Australian forces must go through to better function in the current security environment.

ship.³⁶ Cybernetics is the art of governing, and that of the necessary qualities a ship's pilot and steersman must have in order to reach his goal, and with the leadership qualities that are required. Teleological in essence, the concept pertains to a goal-directed process. As the science of regulation, communication and control, cybernetics is especially important to understand for the conscious actor who wants to guide and lead organizations and societies wisely and for the common good.

At the turn of the Second World War, the concept of cybernetics was used in the fields of mathematics and engineering,³⁷ and eventually, as a natural return to its etymological roots, to all sciences and philosophy. Norbert Wiener,³⁸ the father of modern cybernetics (the science of automated systems, e.g. computers, guided missiles), and others with him, such as Ludwig von Bertalanffy, the father of the General Systems Theory, defined cybernetics as the art of rendering and making an action efficient. In military terms, such science pertains to C2, C3, and C4ISR.³⁹ Information and action are present in all systems (nature, human being, society, machine, economy, etc.), and with them processes of retroaction, feedback, action, regulation, and intent. Such elements of information that guide control are the basis of any organizational process where function of regulation is key for efficiency and sustainability.

Second-order cybernetics, in opposition to first-order cybernetics that are concerned with the predictable, functional, mechanistic, and behaviouristic dimension of human beings, is the science of observed and observing systems that self-regulate and adjust based on feedback and choices of action. Following the works of western intellectuals,⁴⁰ the understanding of cybernetics, with the help of a pluridisciplinary scientific approach, was now complete: a constructivist perspective opened up a new radical epistemology where observation is never independent from the observed, a

³⁶ B. M. A. Jowett, *The Dialogues of Plato*.

³⁷ Norbert Wiener, *Cybernetics or Control and Communication in the Animal and Machine* (Cambridge: MIT Press, 2nd Edition, 1961), p. 232.

³⁸ Parra-Luna, Francisco, 2009, *Systems Science and Cybernetics*, in *Encyclopedia of Life Support Systems* (EOLSS), Developed under the Auspices of the UNESCO, Eolss Publishers, Paris, France

³⁹ Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance

⁴⁰ Such as Warren McCulloch in neurophysiology, Heinz von Foerster in physics, Ludwig von Bertalanffy in biology, Jean Piaget, Gregory Bateson and others in psychology (especially the holistic and systemic approach of *Gestalt*), many of whom participated in the Macy Cybernetics Conferences.

causal circularity in which individuals are causal and moral agents.⁴¹ As a reflexive approach opening up new epistemological and ethical perspectives, cybernetics engages the actor's freedom and responsibility in proportional ways. Consequently, when there is failure following an action, it forces one to stop, to think, and to take the appropriate corrective measures. As wrote Ludwig von Bertalanffy in 1968, in explaining the last type of finality of regulation and control, as one guided by consciousness and intention:

Finally, there is true finality or purposiveness, meaning that the actual behavior is determined by the foresight of the goal. This is the original Aristotelian concept. It presupposes that the future goal is already present in thought, and directs the present action.⁴²

Heinz von Foerster, a figurehead of modern cybernetics, also recognized the ethical dimension such freedom and responsibility entail for the cybernetician:

For some, this freedom of choice is a gift from heaven. For others such responsibility is an unbearable burden. [...] With much ingenuity and imagination, mechanisms have been contrived by which one could bypass this awesome burden. Through hierarchies, entire institutions have been built where it is impossible to localize responsibility. Everyone in such a system can say, "I was told to do 'X'." On the political stage, we hear more and more the phrase of Pontius Pilate, "I have no choice but 'X'." In other words, "Don't hold me responsible for 'X.' Blame someone else." This phrase apparently replaces, "Among the many choices I had, I decided on 'X.'"

I mentioned objectivity before, and I mention it here again as a popular device for avoiding responsibility. As you may remember, objectivity requires that the properties of the observer be left out of any descriptions of his observations. With the essence of observing (namely the processes

⁴¹ Manfred Drack and David Pouvreau, "On the history of Ludwig von Bertalanffy's "General Systemology," and on its relationship to cybernetics- part III: convergences and divergences," *International Journal of General Systems* 44, no. 5 (2015): pp. 523-571.

⁴² Ludwig von Bertalanffy, *General System Theory. Foundations, Development, Applications* (New York: George Braziller, 1968), p. 79.

of cognition) having been removed, the observer is reduced to a copying machine with the notion of responsibility successfully juggled away.⁴³

Design and Desires to Improve

The design environment is a space of relation and of transition composed of cyberneticians in which processes of individuation and of transindividuation (must) unfold. The actor taking part in design and planning is not only part of the conversation, he is also part of the system, part of the problem and part of the solution he wishes to act upon in order to change and to improve that same system. A process of mediation of the group within the realities each designer helps to build, the design process- the art of designing-, and with it the artefact that result of it, are by definition products of the intentional and conscious objects of thoughts.⁴⁴

As within the modern dynamic of pluralist readings and discussions about collective and group identities, such as explained by Habermas about the conversational, reflexive and normative dynamic at play within a systems thinking and design environment and paradigm:

Such discussions make it clear that the disputing parties are expected to consciously choose the continuities they want to live out of, which traditions they want to break off or continue. To the extent that collective identities can develop only in the fragile, dynamic, and fuzzy shape of a decentered, even fragmented public consciousness, ethical-political discourses that reach into the depths have become both possible and unavoidable. [...] norms of interaction have also become reflexive; in this way universalist value orientations gain ascendancy.⁴⁵

Recalling von Humboldt and Peirce's views on conversation, Habermas, explains that representations of the world is the act of intersubjectively sharing that world and our ideals in conversation by proposing and arguing our interpretation of reality to

⁴³ Heinz von Foerster, "Ethics and Second-Order Cybernetics," Conference excerpt, 1991, <http://web.stanford.edu/group/SHR/4-2/text/foerster.html>, site accessed 25 January 2017.

⁴⁴Following Edmund Husserl's *noema* and *noesis* in the structure of intentionality and action. Edmund Husserl, *Idea of Phenomenology* (Dordrecht: Kluwer Academic, 1990), p. 60.

⁴⁵ Habermas, *Between Facts and Norms*, p. 97.

others. Doing so builds a shared understanding of that shared world and reality, and with it, the projections and visions that participate in transforming them through desire and action.

Recent studies in neuroscience underline the importance and power of consciousness and intention as key factors modeling our actions, our world, and reality: “we can state by evidence that consciousness of a movement intention comes prior to movement execution. [...] the experience of willing is obviously perceived before the movement execution. The results support the hypothesis that conscious intention to move induces the enhancement of target-specific motor circuits prior to overt movement execution.”⁴⁶ Following the previous point addressed earlier in this article relative to the necessary transition from the automated individual to that of the conscious actor, studies pertaining to cognitive and neurosciences conclude that conscience plays an important role in cerebral and cognitive functions. “Conscience intervenes in the structuring of the cognitive self that, through experience and learning, modelizes brain networks.”⁴⁷

In this sense, the design construct is a projection of desires and a symbolical construct of representation invested of creation, spirits and souls. Like the role the *mana* plays on social relations as qualities “fixed” on certain Melanesian and Maori objects⁴⁸, so does play design in the Quechua culture of weaving. Drawing from their own experiences and understanding of their world, the complexities of interactions observed, history, memory, and their psychological state, weavers’ designs “can represent an object, an animal, a person, an abstract concept, or an event. The only limit, really, is the imagination and vision of the weaver. [...] Always, a design issues from the weaver’s heart and soul, and the resulting fabric [artefact] is a reflection of his or her

⁴⁶V. R. Zschorlich, R. Köhling, “How Thoughts Give Rise to Action - Conscious Motor Intention Increases the Excitability of Target-Specific Motor Circuits,” *PLoS ONE* 8, 12 (2013): e83845. doi:10.1371/journal.pone.0083845

⁴⁷[Free translation from French] Marc Jeannerod, “Conscience de l’action, conscience de soi,”

⁴⁸Stiegler, *Ce qui fait que la vie vaut la peine d’être vécue*, pp. 117-119.

emotional state.”⁴⁹ It is through imagination and vision that we arrive to alternatives and new realities.⁵⁰

To design is to improve the observed system and the intersubjective and shared reality in construct. Following Bernard Stiegler’s thoughts on the pharmacological⁵¹ nature of the human *tekhne*, we should consider design as a whole, and design artefacts in particular, and even more so the operations that follow, as outcomes, and products of designing.

The group’s artefacts are transitional objects of mediation and projections of realities, and of perceived signals destined to inform and guide the strategic centres of the system within a dynamic circularity, what biologist Jakob von Uexküll calls the “functional circle” and the “reflexive arc.”⁵² Design is more, and is something else than ethical deliberations. Design is the dynamic of projections, moral discourses and moral deliberations at play, “for which the subjects themselves, at both the individual and collective levels, take responsibility. However, these ideas of self-determination and self-realization cannot be put together without tension.”⁵³

By its nature, the design product is teleological, and within such an aim lays the intention and the values driving it. As such, design products are objects that must be carefully taken care of since they contain, as a *pharmakon*, the poison and the remedy, as well as the scapegoat. Understanding designers as cyberneticians, as previously

⁴⁹ Nilda Callanaupa Alavarez, *Weaving in the Peruvian Highlands: Dreaming Patterns, Weaving Memories* (Colorado: Thrums Books, 2007), p. 52.

⁵⁰ As Paul T. Mitchell rightfully mentions further in this volume, design is more of an art than a process.

⁵¹ Under ancient Greek philosophers the *pharmakon* is the cathartic figure, the sacrificial victim, the scapegoat. Bernard Stiegler’s reinterpretation of the term, following Jacques Derrida’s reinterpretation, allows to explore the significance and the effects of technologies, and ultimately of all artefacts. By its nature, an artefact’s effect is ambivalent and ambiguous as it can be positive and negative, as it contains at the same time the remedy, the poison, and the scapegoat. Ultimately, one’s conscience, knowledge, and experience allow unveiling such desired and undesired effects prior to its materialization. See: Stiegler, *Ce qui fait que la vie vaut la peine d’être vécue* Also: Ars Industrialis, association internationale pour une politique industrielle des technologies de l’esprit, <http://www.arsindustrialis.org>, site accessed 25 January 2017.

⁵² Jakob vonUexküll, “A Stroll Through the Worlds of Animals and Men. A Picture Book of Invisible Worlds,” 1934, in *Instinctive Behaviour: The Development of a Modern Concept*, ed. and trans., Claire H. Schiller (New York: International Universities Press, 1957), p. 8.

⁵³ Habermas, *Between Facts and Norms*, p. 98.

defined, allows a better understanding of the importance of consciousness and intention within such roles.⁵⁴ As such, design is a tool that can reveal huge potential for leaders, system thinkers, planners, and designers who deem to look at profound systemic causes and their effects, and who recognize the responsibility they have as agents that influence the system, and as actors with potential transformational power.

Thus, problem solving and design is fundamentally an ethical and moral project. Eco-systemic in its approach, design is not just about action, but acting the right way for the common good. Such is the purpose we should be designing for, in answer to the question Ofra Gracier previously asked in her paper. The measure of efficacy, and with it the “degrees of freedoms” design generates, as previously posed by Ofra Gracier and Alex Ryan, must not be mistaken with that of validity. From a relativist perspective based on personal experience and that of self-disruptiveness, ‘true validity’ of design is by nature found within a holistic perspective based on ethical and moral grounds on which degrees of freedom and improvement are qualities observed and shared amongst the communities involved and impacted by design. The validity of military design outcome, like that of other political design, should notably be informed, as put by Alex Ryan in his concluding thoughts, by measuring the degree of harm and suffering caused by the designed intentions and actions. Answer to the following question is fundamental for soldiers, operational and strategic military designers, planners, and above them the strategists and the political deciders: What do you desire to see: peace or war? The dynamic action and the transformational capacity the answer engages and projects onto the observable reality inform us about our intentions, and the consequences of our actions.⁵⁵ As the Governments of the States Parties to the UNESCO declared following WWII, “since wars begin in the minds of men, it is in the minds of men that the defences of peace must be constructed.”⁵⁶

The quality conferred to the design product and its outcomes is the validity that confers legitimacy to the design construct. If the constructive and collective process of communication is a condition for validity and legitimation about the epistemology of the shared reality, as well as *truths* that emanate following this collective

⁵⁴ Stiegler, *Ce qui fait que la vie vaut la peine d’être vécue*, pp. 115-122.

⁵⁵ On this topic, see also the section *Krisis and Vision at the Apex of the System*, further in this article.

⁵⁶ United Nations Educational, Scientific and Cultural Organization, *Basic Texts, 2014 edition*, (Paris: United Nations Educational, Scientific and Cultural Organization, 2014), p. 5.

interpretation,⁵⁷ a further and more important validation and legitimation process is warranted: when the group's actions transcend into the social and political spheres, the information feedback should be captured by that same group in order to inform it of the outputs and outcomes its action have had. Such a validation process should not only be made by the group itself, but ultimately evaluated and appreciated by the ethical and moral qualities the actions unveil to the observers within the sociopolitical field of deliberations.⁵⁸ This process is even more important within a design setting where designers are constitutive of the State, and emanate from the governing body, of which civil servants and soldiers are a part. This exercise is one of indirect political authority.⁵⁹

Following Bertalanffy, the ethical and moral responsibility of the actor, the cybernetician when observing and designing systems also means to be aware of one's own intentions and the aim pursued,⁶⁰ an antithetical perspective, as previously highlighted in this article, and elsewhere in this series, to behaviorist and functionalist approaches to human beings.

Moreover, the dangers of "systems" are apparent. Systems designers, analysts, researchers, behavioural engineers, and members of similar professions [...] contribute to or even lord over the industrial-military establishment. Elaborating weapons systems, dominating advertising, mass media, and propaganda, and in general preparing a cybernetic

⁵⁷ Ibid., p. 14.

⁵⁸ Habermas, *Between Facts and Norms*, p. 97. On validity and legitimacy, the next section, *Krisis and Vision at the Apex of the System*, will also address this topic as it pertains to the strategic realm.

⁵⁹ On abstraction and reflexivity in social constructs, see also: Frances Westley, Steven R. Carpenter, William A. Brock, C.S. Holling, and Lance H. Gunderson, "Why Systems of People and Nature are not Just Social and Ecological Systems," p. 108-113, in, *Panarchy. Understanding Transformations in Human and Natural systems*, eds. Lance H. Gunderson, and C.S. Holling (Washington: Island Press, 2002), pp. 507. For a detailed and interesting systemic analysis of the social construct of interactions, relations and semantics, see: Albin Wagener, "Le système interactionnel: connexions sémantiques et contextuelle relationnelle," *Nouvelles perspectives en sciences sociales: revue internationale de systémique complexe et d'études relationnelles* 7, no. 2 (2012): pp. 67-104.

⁶⁰ Marc Jeannerod, "Conscience de l'action, conscience de soi," p. 4. Within a causal agent framework, where action, conscience and reflexivity intervene, the author underlines the importance psychological pathologies can play in over attributing oneself the actions and causes observed and lived. Nevertheless, when observing the current social and political context we live in, one must conclude that the exact opposite dynamic seems at play: the world suffers from a lack of individual responsibility, agent causality, and consciousness.

society of the future, they must of necessity tend to exclude or suppress the “human element.” For this human element, individualistic, capricious, often unforeseeable, is precisely the unreliable part of the “megamachine” (to use L. Mumford’s term) of the present and future; hence, it should be either replaced by computers and other hardware or else made “reliable” – that is, as machinelike, automated, uniform, conformist, and controlled as possible. “Systems” thus appears to be the epitome of the automated wasteland of *Brave New World* and 1984.⁶¹

It is also the essence of Norbert Wiener’s warning for who has power of control and command: “The power of cybernetics to save, enslave, or destroy humanity.” This warning is even more important our days for actors and organizations like the military that heavily rely on technology and artificial intelligence: the danger of disconnecting the human component from the center of decision and the loss of control over action.⁶² Responsibility and moral obligation must be preserved to organize our future.⁶³

In conjunction with such technological risk is the danger of proletarianization of individuals: instead of actors that think and act autonomously, they become automates and transfer their expertise, their knowledge, and their responsibility in the hands of a system, a technology, and by extension, of an order, and of a plan.⁶⁴

In lieu of the classic *arethaic* and aristotelian ethics that guided the good life, modern philosophical development allows to explain and contextualize the emphasis put on self, subjectivity, and consciousness. As writes Habermas:

One finds an increasingly pronounced abstract demand for a conscious, self-critical appropriation, the demand that one responsibly take

⁶¹ Manfred Drack and David Pouvreau, “On the history of Ludwig von Bertalanffy’s “General Systemology,” and on its relationship to cybernetics- part III: convergences and divergences,” *International Journal of General Systems* 44, no. 5 (2015).

⁶² A critical and important reflection on artificial intelligence and automated weapon systems in the context of International Humanitarian Law, see: Markus Wagner, “The Dehumanization of International Humanitarian Law: Legal, Ethical, and Political Implications of Autonomous Weapon Systems,” *Vanderbilt Journal of Transnational Law* 47 (2014): pp. 1371-1424.

⁶³ Stiegler, *Ce qui fait que la vie vaut la peine d’être vécue*, p. 180.

⁶⁴ *Ibid.*, p. 37. This is the nature of the danger Socrates spoke of when addressing the danger books constituted as *hypomnesia* for the *anamnesis* quality of memory. See: *Anamnesis and Hypomnesia. Plato as the First Thinker of the Proletarianisation, Ars Industrialis*, <http://arsindustrialis.org/anamnesis-and-hypomnesia>, site accessed 25 January 2017.

possession of one's own individual, irreplaceable, and contingent life history. Radicalized interiority is burdened with the task of achieving a self-understanding in which self-knowledge and existential decision interpenetrate. [...] The intrusion of reflection into the life-historical process generates a new kind of tension between the consciousness of contingency, self-reflection, and liability for one's own existence. To the extent that this constellation has an ever broader impact on society through prevailing patterns of socialization, ethical-existential or clinical discourses become not only possible but in certain sense unavoidable: the conflicts springing from such a constellation, if they are not resolved consciously and deliberately, make themselves felt in obtrusive symptoms.⁶⁵

Within a dynamic process of self-determination and self-realization, of empowerment and of transformational capacity of the agents, the traditional lines separating the operational level from the strategic level become blurred. Unveiling these imaginary lines tends to erase the rigidity of hierarchy, and with it shedding light on new realities and truths that can challenge mission statements and commanders' intent. By nature, the full enterprise of design creates new tensions- otherwise seen as potentialities in other settings- between silos and levels.

An example of this dynamic tension created by true and efficient critical thinking a design product has had, is given in Pettit and Toczek's in this series: the work of a group of designers had revealed profound contradictions and paradoxes with strategies that forced the 'Commander's Design team' to basically look elsewhere.

Also reflecting on such 'contradictions,' Grant Martin, as found further in this volume, speaks of the 'paradoxes' and the 'competing values' that appear when changing perception when looking at war, politics, and the military as a holistic, single and same idea instead of seeing them as separate worlds and communities. Doing so, as concludes Grant Martin, would allow the military - i.e. soldiers and politicians- to address 'problems in a more productive manner,' and better understand the values that drive the violence and war the United States- and States in general- engage with others.

⁶⁵ Habermas, *Between Facts and Norms*, p. 96.

Following this reasoning, the next step in this inquiry is the most important and fundamental one in order to ‘close’ this reflexive and iterative loop. It is here that the most important questions must be asked and answered. Doing so allows to unveil the nature of the system and its complexities, and ultimately to better act within it. As Ofra Gracier has put earlier in this series, asking the right questions is the driving force of any inquiry. However, because of their nature, asking such questions necessitates courage and risk taking, qualities that are unfortunately too rare if not absent within institutions. What are the problems we are talking about? What is the nature of these problems? Problems for whom? What is my/our role, if any, concerning these problems?

What has been described elsewhere as ‘paradoxes’ and ‘contradictions’ following design inquiries, are in fact the natural tensions, realities and truths that are discovered and that emerge following *true* systemic thinking and design; ‘disruptive’ design is a pleonasm as such character is immanent to this art and philosophy. Such discoveries, like those made by Giordano Bruno in the field of philosophy executed during the Inquisition, or those of Schoenberg and Stravinsky in the field of arts as previously mentioned in this article, lift the veil of hypocrisy, and, by doing so, provoke violent and “terrorist” behaviour⁶⁶ within the conservative elite of organizations. Such reactions are notably expressed by the use of terms such as ‘subversive’ and ‘insurgent’ when speaking of critical thinkers, designers and system thinkers. Military doctrines that are currently introducing systems thinking and design in operational planning are currently confronted with what might seem, at first hand, as a conundrum, but in reality it is a natural and profound tension between two paradigms. The degree to which such new conceptual tools are to be introduced and used in military organizations, in conjunction with the strategic levels - a debate that confronts those categorized as the ‘purists’ opposed to the ‘pragmatics,’ as Aaron Jackson explains in this series in regard to recent efforts made by the Australian Defence Force in incorporating design within its doctrine- will serve as an indicator of the systems adaptiveness and resilience, as previously explained in this paper.

⁶⁶ See footnote 25.

Values as Dynamic Vectors of Systems

The enhancement of one's perceptual and sensitive fields is an imperative condition for whom wishes to have a systemic perspective.⁶⁷ Better qualitative appreciation of reality is the essence of complex systems. It also allows a better understanding of the teleological dynamic at play, and with it, the necessary adaptations that are required for better and more effective control. To achieve such state, it is necessary to develop our senses of perception and with them a better sense of the interrelations that compose our world and our environment. The development of better perceptual and sensori-motor functions of organisms and systems allow better responses and actions; following Jakob von Uexküll's concept of *Umwelt*,⁶⁸ "The existence of the subject animal as, *per se*, a receptor of significations consists of a perception and of an acting."⁶⁹

The environment of each human being is his or her own world of affect, perception and experience. It presupposes the capacity and the will of each being to make himself and herself accessible to this *Umwelt* in order to access lived experiences, perceptions, stimuli, and actions (generated by our self or another). Thus, we can choose to perceive and act our reality and the world such as a tic does, within the limits of very limited number of affects. We can choose to live the life of simple organisms driven by egoistic desires and hedonistic and individualistic pulses, or that of conscious

⁶⁷ The works of Abraham Maslow pertaining to motivation, needs and self-actualization of individuals, and to those of Lawrence Kohlberg on moral development stages of individuals, can serve as psychological and conceptual tools in analysing individuals conventional level and moral development. Others, such as David McClelland and his iceberg model based on personal values and behaviour, and those of Myers and Briggs on personality attributes, could also serve in helping individuals discover their cognitive self, their individuation, and help develop their degree of conscience. Such reflexive and cognitive tools should prove to be very useful for individuals, especially, for designers, the design settings and the design product. Steven L. Pettit and David M. Toczek's essay in this series explain how Myers-Briggs Type Indicator (MBTI) has proven to be a useful tool in selecting members of a design team.

⁶⁸ An *Umwelt* is an organism's perception of the world and environment as a subjective experience. Jakob von Uexküll, "A Stroll Through the Worlds of Animals and Men. A Picture Book of Invisible Worlds," in *Instinctive Behavior: The Development of a Modern Concept*, ed. & trans. Claire H. Schiller (New York: International Universities Press, 1957).

⁶⁹ Jakob von Uexküll, *Mondes animaux et monde humain* (Paris: Éditions Denoël, 1965), p. 166. [Free translation from French]

and holistic actors driven by moral and ethical values, with wider and better sensitivity to our environment, to our world, and to our ontological being.⁷⁰

To achieve this personal and collective awakening, it is necessary to know our self and to know ourselves, such as goes the question *to ti estin* (the what is to be?). It is necessary to understand and to discover the unicity and the specificity of a thing, of a person, of our individuation in order to better partake in the world we live in, we act in, and we act on.

Thus we ultimately reach the conclusion that each subject lives in a world composed of subjective realities alone, and that even the *Umwelten* [multiple worlds] themselves represent only subjective realities. Whoever denies the existence of subjective realities, has failed to recognize the foundations of his own *Umwelt*.⁷¹

If our human condition imposes upon us a limited capacity to pick-up a very small portion of signals of a somewhat larger objective reality composing the environment,⁷² some human systems of values and worldviews act proportionally in helping or refraining our capacity to sense, to feel and to re-act.

As the authors of the Meadows Report wrote in their recent 30-year update:

The deepest difference between optimists and pessimists is their position in the debate about whether human beings are able to operate collectively from a basis of love. In a society that systematically develops individualism, competitiveness, and short-term focus, the pessimists are in the vast majority. Individualism and shortsightedness are the greatest problems of the current social system, we think, and the deepest cause of unsustainability. Love and compassion institutionalized in collective solutions is the better alternative. A culture that does not believe in, discuss, and develop

⁷⁰ Michel Lehmann, "Levée du refoulement et acte analytique," *Analyse Freudienne Presse* 2, no. 8 (2003): pp. 25-35, <http://www.cairn.info/revue-analyse-freudienne-presse-2003-2-page-25.htm>, site accessed 25 January 2017.

⁷¹ von Uexküll, "A Stroll Through the Worlds of Animals and Men," p. 72.

⁷² Recent studies in neuroscience give us a perspective of our (limited) human field of perception. See: Amanda Gefter, "The Case against Reality," *The Atlantic*, April 25 2016, <https://www.theatlantic.com/science/archive/2016/04/the-illusion-of-reality/479559/>, site accessed 25 January 2017.

these better human qualities suffers from tragic limitation in its options.⁷³

Our current world system generates *entropy* (deregulated state of a system, as opposed to negentropy) and behaviours of *autolysis* (self-destruction of a system). Its dominating value system, liberal and capitalist in nature, serves as the foundational and ideational basis that operationalizes our sociopolitical relations. This value system serves as the dynamic force that sculpts, transforms, and materializes human relations, and the biosphere with it. Based on a hobbesian vision of humanity in which “man is wolf to man,”⁷⁴ rationalism, individualism, utilitarianism, and competition are the prevailing values that make up such construct, and with it its material and symbolic representations. Under this worldview and construct, human beings are understood as the ultimate sovereign entity of rights and freedoms. In parallel to such understanding, human relations, like that of States on the world stage, are seen through the prism of *realpolitik*, realism, self-interest, and egoism. This reductionist and simplistic conception of human nature and human relations, the sum of atomized individuals, is that of the *homo economicus*. This egocentric posture transcends into our policies, and serves as the driving force in structuring our world. A strong and eloquent demonstration of the effects of this system was recently demonstrated by Chrystia Freeland, Canadian minister of Foreign Affairs, in her denunciation of the world’s plutocrats and oligarchs.⁷⁵

A new social and political contract of cooperation and reciprocity is needed, one in which reciprocity and cooperation guide the political deliberation.⁷⁶ Such a radical shift towards humanism and ecology might also mean in studies of conflict, defense

⁷³ Denis Meadows, Donella Meadows and Jorgen Randers, *Limits to Growth. The 30-Year Update* (White River Junction, Vermont: Chelsea Green Publishing, 2004), p. 281. Also known as *The Limits to Growth* (1972), the report, commissioned by the Club of Rome, was an exploration into system dynamics and interaction between human systems and the biosphere. Amongst the systemic tools used, were computer simulation (*World 3*), and Causal Loop Diagrams.

⁷⁴ As Habermas underlines in his analysis of social construct and the system of rights, Hobbes’ goal was to “ground the construction of a system of well-ordered egoism on the sole basis of the enlightened self-interest of any individual.” Habermas, *Between Facts and Norms*, pp. 91-92.

⁷⁵ Chrystia Freeland, *Plutocrats: The Rise of the New Global Super-Rich and the Fall of Everyone Else* (Toronto: Anchor Canada, 2014), pp. 352. Also: Chrystia Freeland, “The Rise of the Global Super-Rich”, *TED Talk*, https://www.ted.com/speakers/chrystia_freeland, site accessed 25 January 2017.

⁷⁶ See also: “Normative versus Empiricist Models of Democracy,” in: Habermas, pp. 298-302.

and security, passing from war studies and *polemology* (study of conflict and war), to that of *irenology* (study of peace), and *peace ethology* (the study of natural behaviours and practice of peace making and peace process).⁷⁷

Based on positivism, objectivism, realism and rationalism, the current scientific community, and with them the technocrats and bureaucrats, generate and reinforce the dominating posture of this value system. As Paul Valéry wrote in 1919, as well as other intellectuals affected by the spiritual and intellectual crisis that occurred during the inter-war period, “the military crisis may be finished; the economic crisis is visible in all its force. But the intellectual crisis, more subtle, [...] arduously allows itself to seize its genuine point, its phase.”⁷⁸

The same type of paradigm shift that failed to materialize at the turn of the 19th Century is warranted in the realms of human inter-relations and in science and arts, as its function serves as a transmission belt between the worlds of ideas and action, between theory and *praxis*. The necessary approach is one of transdisciplinarity as Jean Piaget originally defined it. A conceptual approach of openness and circularity amongst the fields of science and arts would replace one of linearity and silos.⁷⁹

The mind, of which science is a product, always has two opposite sides. As a *pharmakon* is bad and good, a poison and remedy, so is science.⁸⁰ In his search of the origins of the crises affecting the world at the beginning of the 20th century, Edmund Husserl accused modern sciences of putting aside humanity and existence. “[...] we diverted with indifference of the questions which for an authentic humanity are the decisive questions. From simple sciences of facts form a simple humanity of facts.”⁸¹

⁷⁷ On the study of peace process and the development of ethology as a scientific field of peace studies, see: Peter Verbeek, “Peace Ethology”, *Behaviour* 145, no. 11 (2008).

⁷⁸ Paul Valéry, *La crise de l'esprit*, Variétés 1 et 2, Gallimard, collection “Idées,” 1978, p.16, in: Stiegler, *Ce qui fait que la vie vaut la peine d'être vécue*, p. 26. [Free translation from French]

⁷⁹ Centre international de recherches et études transdisciplinaires, http://ciret-transdisciplinarity.org/index_en.php, site accessed 25 January 2017. See also : André Bourguignon, « De la pluridisciplinarité à la transdisciplinarité », *Transversales Science Culture*, <http://grit-transversales.org/archives/revue/51/science1.html>, site accessed 25 January 2017.

⁸⁰ Bernard Stiegler has written extensively on this reinterpretation of Plato's concept of *pharmakon* (as found in the *Phaedrus* dialogue), following Derrida's own reinterpretation (*Plato's Pharmacy*), and has devoted a complete book on this topic: Stiegler, *Ce qui fait que la vie vaut la peine d'être vécue*.

⁸¹ [Free translation from French] Husserl, Edmund, *La crise des sciences européennes et la phénoménologie transcendantale*, Galimard, 1976, p. 10. Also in: Stiegler, *Ce qui fait que la vie vaut la peine d'être vécue*, p. 26

Such an approach is what Ben Zweibelson in this series refers to as the “radical humanism” paradigm, one from which can operate “problematizers”, transformational agents and, cyberneticians.

Our public powers, and with them their tools of violence and coercion, accompanied by the technologies they develop and acquire, are the prosthesis and the reflections of its values. This is true about orientation and policies applied within the State, and in the conduct of its external affairs.

Krisis and Vision at the Apex of the System

After more than three decades of observation, measurement and analyses of world dynamics of growth, we now know the system has attained its life support limits.⁸² In what seems as an ongoing process of general systemic reinforcing loops, the system’s breakdown and collapse is gaining speed. High levels of interlinkage favour a network of systems to overshoot, as cycles across the system “become synchronized and peak together.”⁸³ Thus is the nature of our current system. Signs the world system is tilting are evident and can no longer be denied. Such dynamic, through the feedback it generates and that we observe, serve to inform us about the system’s state, its qualities and its problems. Climate changes, famine, drought, terrorism, and migration flows are symptoms of the materialization of negative externalities the system generates, and that inform us of the system’s *entropy* and *autolysis*.⁸⁴

⁸² Meadows, *Limits to Growth. The 30-Year Update*. Also see: Thomas Homer-Dixon, “Our Panarchic Future,” *World Watch Magazine* 22, no. 2 (March/April, 2009).

⁸³ Thomas Homer-Dixon, “Our Panarchic Future.” Also see: Gunderson, et al., “Why Systems of People and Nature are not Just Social and Ecological Systems.”

⁸⁴ The World Economic Forum has repeatedly underlined for the last five years the importance of corruption, wealth and income disparity as one of the most important key drivers and global risk factors contributing to suffering, and social and political instability. World Economic Forum, *Global Risks 2012. Seventh Edition. An Initiative of the Risk Response Network*, Report, 2012, pp. 64,

http://www3.weforum.org/docs/WEF_GlobalRisks_Report_2012.pdf

See also: Francis Clermont, “La rhétorique du vide et de l’échec des princes », *Le Devoir*, April 2 2016, <http://www.ledevoir.com/international/europe/467097/attentats-de-bruxelles-la-rhetorique-du-vide-et-de-l-echec-des-princes>, site accessed 25 January 2017.

Policy makers and deciders, managers and directors of the strategic and institutional level, the elected officials as chief amongst them as legitimate representatives of the citizens, are the system actors and moral agents that ultimately set and control the conditions for the desired systemic actions and goals to unfold. Since the normal tendency of systems tends toward some disorganization, informed and smart control is key for leaders, managers and policy makers in regulating the system towards organisation and stability.⁸⁵ At the apex of the system, they are the ultimate cyberneticians. New goals and visions must now inform the direction the world leaders will take in governing human destiny.

As the authors of *Limits to Growth* remind us in their 30-year update, “Vision without action is useless. But action without vision is directionless and feeble. Vision is absolutely necessary to guide and motivate. More than that, vision, when widely shared and firmly kept in sight, does *bring into being new systems.*”⁸⁶ [...] “Visioning, networking, and truth-telling are useless if they do not inform action.”⁸⁷

Darcy Winslow, former senior manager for *Nike* and senior lecturer at MIT, specialized in organisational design and sustainability, highlights the importance for an organisation to ask itself compelling visions and engaging questions “such as what do we want to sustain, because what we love is what we will conserve.”⁸⁸

Decision makers, leaders, designers, and all actors of the system, need to reflect in their actions a higher degree of awareness, of sensitivity, and of consciousness. Well informed and intentioned from a societal perspective will allow these actors to take the right decisions to be taken, especially in times of crisis such as ours. Since *krisis* means decision,⁸⁹ the international community must rapidly coordinate and adjust by taking important and hard decisions in order to correct the current system’s overshoot, and with it our collective path towards human tragedy.

⁸⁵ Norbert Wiener, *The Human Use of Human Beings: Cybernetics and Society* (Boston: Houghton Mifflin, 1950), p. 241.

⁸⁶ Meadows, *Limits to Growth. The 30-Year Update*, p. 272.

⁸⁷ *Ibid.*, p. 279.

⁸⁸ Jo Confino, “The Art of Systems Thinking in Driving Sustainable Transformation,” *The Guardian*, October 15 2012,

<https://www.theguardian.com/sustainable-business/systems-thinking-sustainable-transformation>, site accessed 25 January 2017.

⁸⁹ Stiegler, *Ce qui fait que la vie vaut la peine d’être vécue*, p. 16.

In 2004, following their revolutionary and shocking best-seller work published 30 years earlier, *Limits to Growth*, Donella Meadows, Dennis Meadows and Jorgen Randers wrote a cautionary statement for governments, its security apparatus, and the world elite.

Besides the ones included in World3, there are many other positive feedback [effect in a system that enhances and accelerates a tendency] loops in the “real world” with the potential to produce rapid erosion. We have mentioned the potential for erosion in physical and biological systems. An example of a very different kind would be breakdown in the social order. When a country’s elites believe it is acceptable to have large differentials in well-being within their nation, they can use their power to produce big differences in income between themselves and most of the citizenry. This inequality can lead the middle classes to frustration, anger, and protests. The disruption that results from protests may lead to repression. Exercising force isolates the elites even farther from the masses and amplifies among the powerful the ethics and values that justify large gaps between them and the majority of the population. Income differentials rise, anger and frustration grow, and this can call forth even more repression. Eventually there may be revolution or breakdown.⁹⁰

“Societal ethos”⁹¹ should make its way through the vertical and horizontal systems and organizations composing the overarching system. Such teleological dynamic and intermeshing of ethics and politics across the system should allow better informed policies and actions to materialize. This process is imperative for purpose of validity and legitimacy of our political systems, and our sociopolitical constructs. In this sense, the States’ actions, and the value system supporting its intent, are foundational for its legitimacy. Legitimacy and validity will be gained through a meta-ethical and morality of humanism. This approach might act as a necessary rampart against social revolts, and the populist, fascist, and reactionary movements with which our world is confronted. Such change is a radical shift warranted in human organizations, and with them their military organizations.

⁹⁰ Meadows, *Limits to Growth. The 30-Year Update*, pp. 166-167.

⁹¹ Habermas, *Between Facts and Norms*, p. 95.

Final Thoughts and Questions for Future Research

The issues, concepts and ideas, and the reflective thought process with them that have been raised throughout this article, act as a primer on a new epistemological perspective on systems thinking and design within the military realm and with it the field of possible actions. To ensure true solutions of systemic sustainability and resilience, something else and something new must be tried. However, doing so requires political courage, audacity, and risk taking.

Government-wide, global and comprehensive, such an approach used within governments throughout the world to manage public affairs seems to offer true potentialities in attaining such goals of systemic equilibrium and purposefulness. Canada has been using a Whole-of-Government Approach (WOGA) for example within the realms of military operations, and within Joint, Interagency, Multinational, Public (JIMP) environments. The Government of Canada also uses it as a regulatory system for spending, and as a policy framework for the management of its public treasury throughout all its administrative bodies. Believed to provide better results in terms of control, command, and communication, this approach is also deemed key in order to better achieve strategic goals and results. For decision makers, actors and regulators within the political-administrative apparatus, such an approach is making its way as a government-wide public policy framework. This approach seems to offer high potentialities in terms of regulation and control and as a conceptual tool that is better adapted to address the complex realities of our world. An in-depth look into such an approach is necessary to understand better if it is working: and, if so, in achieving which goals? Other questions for future research seem warranted to investigate:

- To which degree is there openness within the Government of Canada (GOC) in integrating systems thinking and design and a whole-of-Government Framework and Approach to all strategic governmental business?
- In terms of public policy analysis, what does research and evaluation inform us about the effectiveness, the potentialities and the outcomes of WOGA?
- Assuming that the GOC WOGA is based on a *new public management* perspective, if such is its real essence, would it be useful for systemic

sustainability and resilience to reintroduce this holistic approach and teleological framework, but with human development, sustainability and resilience as its guiding principles and values?

- Following Defence Research and Development Canada, Scientific Report, DRDC-RDDC-2016-R057, April 2016:⁹² Why is it that ‘political and humanitarian issues’ are intrinsically closed out of OPP? What are the impacts of such limitation in the designers’ foresight? Hindering the quality of information destined to higher strategic levels, what are the effects for operations? for the WOGA? What are the impacts on for the strategic levels?
- In tackling wicked and complex problems within a JIMP environment, how do collaboration, interdependence, coordination, cultural differences, and trust influence a WOGA dynamic, the aims pursued, and the outcomes?
- At the strategic level, what should be the conditions and the degree of openness to the type and nature of information generated from design products, and that inform higher levels of command?
- What are the ideational and material conditions that the strategic level actors can set to capture and enact upon the information received, especially if it means reconsidering strategies?
- What would be the impacts on government policies, military planning, conflict resolution, and strategic goals and intent, in integrating *ethology* and *irenology* in replacement or in addition to *polemology* and war studies?

⁹² N. Derbentseva and Michel Lizotte, *Collaborative understanding of complex situations. A Toolbox for Multidisciplinary Collaboration (TMC)*, Defence Research and Development Canada, Scientific Report DRDC-RDDC-2016-R057, April 2016, p. 72