AN END TO ETERNITY? VILÉM FLUSSER'S TECHNICAL IMAGES,
CONTEMPORARY WAR AND MULTIPOLAR GEOPOLITICS.

Marcus Augustus Lessa

Tese de Doutorado apresentada ao Programa de Pós-graduação em Engenharia de Produção, COPPE, da Universidade Federal do Rio de Janeiro, como parte dos requisitos necessários à obtenção do título de Doutor em Engenharia de Produção.

Orientador: Domício Proença Júnior

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UM FIM PARA A ETERNIDADE? AS IMAGENS TÉCNICAS DE VILÉM FLUSSER, A GUERRA CONTEMPORÂNEA E A GEOPOLÍTICA MULTIPOLAR.

Marcus Augustus Lessa

Junho de 2023

Orientador: Domício Proença Junior.

Programa de Pós-graduação em Engenharia de Produção.

Esta tese apresenta uma coleção de 3 artigos publicados e um ensaio. O primeiro artigo, sobre educação superior, endereça questões referentes ao gesto da leitura aprofundada de livros e da sua anotação com marginalia, e como tal gesto está sendo modificado pela difusão crescente de livros digitais, atualizando o clássico de Mortimer Adler (1941) desde a perspectiva flusseriana dos aparelhos e programas que os viabilizam. O segundo analisa a política de defesa brasileira na versão dos seus principais documentos em vigor em 2013, a Política Nacional de Defesa e a Estratégia Nacional de Defesa a partir das perspectivas dos estudos estratégicos, para desvelar como outras *polities* as interpretariam, e das políticas públicas, para desvelar o seu possível significado e utilidade como política de desenvolvimento tecnológico. O terceiro oferece uma análise histórica do contexto americano e soviético ao começo e ao final da Guerra Fria para avaliar como cada potência organizou seus esforços para combater com armas combinadas diante das suas restrições materiais e sociais. Finalmente, o ensaio retoma a obra de Vilém Flusser para discutir eventuais bases epistemológicas para o estudo da estratégia e da geopolítica num mundo que está retornando à multipolaridade diante da mudança cultural dos paradigmas da sociedade industrial e do texto linear para sociedades pós-industriais e das imagens técnicas.

Abstract of Thesis presented to COPPE/UFRJ as a partial fulfillment of the requirements for the degree of Doctor of Sciences in Production Engineering (D.Sc.)

AN END TO ETERNITY? VILÉM FLUSSER'S TECHNICAL IMAGES, CONTEMPORARY WAR AND MULTIPOLAR GEOPOLITICS.

Marcus Augustus Lessa

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This doctoral dissertation collects three published articles and an unpublished essay. The first article deals with the transformations in the gesture of deep reading (e.g., reading for understanding) and making associated marginalia as we shift into the world of ebooks and the Flusserian apparatus and programs which make them possible, in an actualization of Mortimer J. Adler's 1941 classic work on marginalia. The second article analyzes the Brazilian defense policy documents in their 2013 iteration, using the lenses of strategic studies — to reveal how they might be perceived by other polities — and public policy — to reveal how they might be internally perceived given their stated objective of serving as developmental tools. The third offers a historical analysis of US and Soviet contexts in the beginning and end of the Cold War to analyze how each superpower organized and conducted their efforts to make themselves able to fight wars using combined arms. The final chapter reconnects with Flusserian thought to discuss possible epistemological bases for the study of strategy and geopolitics as we return to a multipolar world in the midst of a shift in cultural paradigm, from industrial to post-industrial societies and from linear texts to technical images.

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1. **INTRODUCTION**

1.1 OVERVIEW AND BRIEF SURVEY OF CONTRIBUTIONS AND CHARACTERISTICS OF ORIGINALITY

This doctoral dissertation is presented as a collection of three published articles and an unpublished essay. It is organized as follows: an introduction, presenting each text briefly, describing research questions, academic communities to whom they are addressed, relevant contributions and characteristics of originality, precedes the three articles and the essay. They are followed by a conclusion.

While this introduction does not purport to either summarize or offer commentary (or meta-analyses) on each article, it does intend to highlight the elements — which can be appreciated in full in their respective texts — that show how this collection satisfies the formal requirements for a doctoral dissertation as per Coppe guidelines and regulations.

It is also worthwhile mentioning that this collection reflects a number of restrictions and biases. To begin with, each published article was drafted initially based on an identified opportunity for publishing (e.g., venue and scope) against the backdrop of the candidate's interdisciplinary background (in law, public policy and professional education). Its intention was to satisfy Coppe's oft-stated and well-known preferences regarding published JCR-indexed journal articles.

While this has not compromised any of the articles' individual quality of research, relevant contribution and characteristics of originality, it is very important to keep in mind that they were not drafted, submitted and published as chapters or intermediate stages of a single body of research, purporting to answer a single question (or even a series of related questions), in a particular topic, based on a given set of empirical observations, that lead to results explained by a particular analytical perspective, resulting from a single literature review. Quite the contrary: each article has its own specific question(s), analytical frameworks, answers and results, and stands alone in regards to the others.

So, the 3 articles don't really make up "a whole", and, for that reason, it is beyond usefulness to either attempt to read them as such or, perhaps even worse, to have them appear to do so. They articulate research questions in professional education, international relations and defense policy.

Making Marks While Reading, With Some Remarks on the Challenges Posed by the Digital World (Chapter 2, *infra*) identifies the fundamentals and rationale of making marginalia ('marks') while reading, with particular attention to their role in the preservation of insights

('sparks') and in furthering discovery, pointing to the need to develop emotional as well as intellectual signifiers to allow readers to capture and recall their understanding of the texts they read and the significance of their marks. This further supports the framing of relevant issues in the passage from reading and marking on paper to digital books, pointing towards approaches that would allow better understanding of the shortcomings of this medium for deep reading and making marks while reading.

There are at least two significant contributions worth highlighting, both original in their own right. First, the article engages a classic in the field (Adler 1941; 1972) and restates the gesture (cf. Flusser 2014) of marking while reading in the context of professional higher education. It is a step forward in regards to Adler's original text (1941) because it expresses its restatement of how one might mark while reading based on a similar level of intentionality as an artist would display when choosing brushes, paints and medium (while Adler's perspective was closer to the high school student's). This is a radical connection to Flusser's *Gestures* (2014) in the sense that it seeks to evoke, in its readership (considering its use in undergraduate teaching), the intellectual freedom one can aspire to (and perhaps, even reach), in the gestures of reading for understanding, or deep reading, and of marking while reading. This, in itself, is a step forward in regards to Adler's (1972; 1941) original proposal, because reflecting on such choices is relevant not only to a general discussion of the education of individuals in light of a particular corpus of written works (e.g., Adler's original humanist concern) but, perhaps more importantly in the current context in which the article was drafted, in professional higher education. That future engineers (or doctors, lawyers, or policy planners) are being educated in a world in which general culture is moving away from written texts is an issue unforeseen in Adler's world; and this brings special concerns to the gesture of "deep reading," in other words, reading for understanding.

This leads to the second, and even more original, contribution, in its analysis of how digital books might affect the gestures of deep reading and of marking while reading. While there are several other relevant texts which seek to address this issue (Baron 2015, Wolf 2018, see generally works cited in Ch. 2), the article does so from a different starting point: recognizing that digital books are not "books" in the physical sense but are, instead, text displayed on Flusserian apparatus in accordance with their program. This allows the article to further explain and compare reading and marking in each context based on varying degrees of freedom and allowed intentionality, in addition to arguing its significance for the education of future generations.

Brazilian National Defence Policy and Strategy Reviewed as a Unity (Chapter 3, *infra*) is an original review of the Brazilian defense documents in their 2013 iteration.

There are two main original contributions which, taken together, lead to the article's significance: increasing our understanding of what other sovereign nations might read from the documents (and how they might form their own opinions), and the directions the political establishment (e.g., responsible for budget appropriations) and policy designers (and implementers) might find. These contributions result from the epistemic choices of analyzing security concerns both from the perspectives of Strategic Studies (in itself a contribution to the community of International Relations) and Science, Technology and Innovation ("STI") policy (in itself a contribution to the epistemic community of Public Policy).

That it chooses to do considering the documents as a unity, refusing to consider them as either proxies for Civilian-Military Relations or as a diplomatic message of Brazilian intentions, is another of the article's original characteristics. However useful these other analyses might have been, none of them has attempted to do so, which would have allowed them to express what the Brazilian policy and strategy's significance might be either as a guide for force design (the lens of Strategic Studies) or for development policy (the lens of STI). As of its publication, and as late as 2022, it was the only article to have done so.

The analysis of security concerns can be an issue in itself given that, as a result of its historical trajectory, Civil-Military Relations in Brazil are a sensitive topic. Even so, the broad context of the formulation of a defense policy and strategy, and, consequently, of defining the purpose, mission and design of the armed forces, was the *redemocratização* following the 1988 Constitution. To successfully do so given these forces would require granting a wide latitude in terms of military autonomy and, as much as possible, ensuring a measure of non-interference from the civilian political establishment. In a way — as the article develops in full — these impossible requirements are at the root of the practical and logical tensions within the documents, tensions which have remained unresolved until the present. To name but one example, to this day it is unclear whether the Minister for Defense has the final authority on military expenditures or even where exactly he stands in the chain of command, issues that remain subject to political power (i.e., as rendered possible or impossible in light of circumstances), not administrative (i.e., legally established and as such enforceable).

In this sense, the article appeals to a renewed need to criticize and otherwise address the enduring continuity of the "security and development" motto developed during the military dictatorship, by shedding light on the real choices and trade-offs between Brazilian defense and developmental efforts, hoping at some point it might lead to an actual debate.

A trajetória das divisões pesadas da URSS e Rússia e dos EUA ao início e ao final da Guerra Fria (Chapter 4, *infra*) presents and discusses the path that led to the organizational designs of the heavy divisions of the USSR and the USA at the start and at the end of the Cold War. It explains modern combined arms centered on the tank, and the central role of the army division (10,000-20,000 combatants) for the provision of the different types of troops required to have them when necessary. It then addresses the tank and mechanized corps of the USSR and the armored division in 1945, outlining how these led to the motor rifle and tank divisions of the USSR and the armored and mechanized divisions of the USA c. 1985, as proxy for 1991 to account for the turbulence at the end of the Cold War. It argues in conclusion for the continuity and prevalence of the issue of providing for combined arms centered on the tank in the division as the prime concern for the organizational design of ground forces to the present.

Strategic Studies is an interdisciplinary field, and most international venues are cognizant of this reality. However, in Brazil, the subject has been fragmented and fitted (ill-fitted, perhaps) in three different communities that rarely dialogue and choose to stand apart from each other. Civilian-military relations and international security, two of Strategic Studies' most important topics, belong to International Relations, a community generally accessible to civilian authors. Force design and defense policy, other prime topics, belong to Defense Studies, a community which generally only supports dialogue among military authors (and their organizations) and considers itself immune from outside expertise. The march of events, either in preparation for or during action of war, and the military as a general phenomenon, belongs to History, and, in its many different communities, admits both civilian and military contributions.

In this context, the article's most significant and original contribution, given the epistemic landscape in Strategic Studies in Brazil, is reaffirming the unity of Strategic Studies as a subject, connecting various aspects of history, force design and the civilian context in which sovereign nations make political, societal and technological choices regarding what forces they should have, given their political aims that might require the use of force. It does so by being, in a broad sense, a historical piece, though not "military history." It argues for the epistemic fragility, even impossibility, of considering "defense studies" as a standalone field. Not only does it expose the need for "opening the black box" in military affairs, but it shows how it is possible to do so, for example, by refusing to treat technology as a given instead of as an object for analysis. But it goes even further: it discusses the rightsizing of military organizations considering scale and scope as boundary conditions, incorporating the practitioner's — the engineer's, most notably the production engineer's — perspective. This leads to another

significant contribution: the argument, firmly supported by factual analysis, conceptual developments and the epistemic unity of Strategic Studies, that organization is relatively much more important than matériel (cf. Chapter 3, infra, and the analysis of the Brazilian defense policy and strategy for several examples of how contradictory this is in light of prevalent Brazilian, but not only Brazilian, thought).

As far as can be told, it is the third work published in a Brazilian qualified academic venue that argues for the need to understand the inner workings of the military "black box" against the backdrop of historical – therefore civilian – contexts, and the first to do so using illustrated Tables of Organization and Equipment to show how combatant forces are organized and fight.

They are followed by an essay whose title is the title of this dissertation: *An End to Eternity? Vilém Flusser's Technical Images, Contemporary War and Multipolar Geopolitics* (Chapter 5, *infra*). This essay restates many threads from previous chapters under a Flusserian phenomenological analysis of the conduct and study of strategy and war. The choice of Vilém Flusser's provocative philosophy of language and communication results from acknowledging our shift into a telematic society, in which the prevalence of written texts will be continuously reduced in light of the ascendance of technical images and the apparatus and programs which support their creation and dissemination. This brings the material full circle considering the previous articles, and, in itself, offers an additional contribution in the criticism of the epistemological limitations that the study of strategy and geopolitics faces in light of the double shift: from an industrial to a post-industrial, telematic society, and from a unipolar to a multipolar world.

We are currently witnessing a shift into a post-industrial and post-historical society: into the world of technical images. This change in cultural paradigm will affect how we relate to written texts (Ch. 2), and, compared with the industrial age (Ch. 4), how we conceive of war and strategy, especially in societies which have (or had) been active drivers of history. This dissertation ends in an attempt to frame the discussion of what this paradigm shift will entail for the study of war and strategy (Ch. 5), a reflection which will become more pressing even though our lives within the program will probably suggest otherwise. In a sense, it is a historical endeavor in a post-historical climate.

2. MAKING MARKS WHILE READING, WITH SOME REMARKS ON THE CHALLENGES POSED BY THE DIGITAL WORLD

2.1 PREAMBLE

Why and how to make marks while reading are of capital importance to the acquisition of knowledge and development of self. However, it is a skill rarely taught, whose acquisition is often left to tacit self-education. We ourselves, in our experience as students and teachers, know how difficult the first few steps in gaining the skill of marking while reading can be. We also know of the dedication it may require, even if the journey should last no longer than a given educational or professional passage: the monograph, the dissertation, the thesis; a job selection, a project; an undertaking of study, research, development.

As faculty in an engineering school, it has fallen to us to engage students in appreciation of the liberal arts, and how it might help them better understand the world and reflect upon their place within it, stoking, in their minds, the flames of the Trivium into a refiner's fire. Our framing of education in engineering is rooted in the foundational understanding of engineering as ingenuity and art, with ingenuity standing for the ability to reason alternative cause-effect chains and art standing for the ability to arrange a particular set of such chains in order to arrive at a desired result (Gombrich, 1995; Highet, 1989; Whitehead, 1967; Wilde, 1891). But this is further developed into an understanding of engineering as design under constraints, that is to say, as having to produce the best possible change in a given situation, relying on whatever might be effective to bring about that change.

This amounts to taking the liberal arts as conditions of possibility for engineering education (Silva et al., 2018). However, the liberal arts are often slighted or, conversely, erroneously taken for granted by the sciences of the artificial (Simon, 1977, 1996), that is, those bodies of knowledge that seek to change reality (e.g. medicine or engineering), as opposed to those that seek to explain it, the sciences of the natural (e.g. biology or physics). In doing so, they fail to see that it is precisely the liberal arts that would allow students to better understand the epistemological separation between sciences that describe, explain, and predict reality and those disciplines that seek to change it (Florman, 2015; Silva & Proença, 2015).

This lens – ingenuity and art – allows us to explain how the same alphabet can be used for different languages, how silent reading with hand-held books became feasible (Illich, 1993), and even, as argued in this article, how making marks while reading allows readers to effect a dialogue with the book (Adler, 1941; Adler & Van Doren, 1972), all as technologies that enable understanding. That written or printed words in texts and readers' marks came to convey as

much meaning as the spoken word is extraordinary (Dehaene, 2019). It enabled reading to further fulfill the task of imposing order on reality through language (Flusser, 2018).

In addressing the issue of marking while reading, we distinguish our considerations from concerns about note-taking during lectures: about the potential and value of unstructured thinking, of serendipity (Lewis & Moffett, 2020), or the role-reversing considerations between lecturers and audiences through preparation, presentation, silent listening, and finally, understanding, admitting to the possibilities of self-transformation in each (Vlieghe & Zamojski, 2020). There is, nonetheless, a deep point of contact here with what follows in the attention paid elsewhere to the power of gestures (Flusser, 2014), both individual (Marin & Sturm, 2020) and collective (McNeill, 1995). Conversely, there is much to be addressed in terms of the shift brought about by digitalization, from prognostications of the obsolescence of pens, pencil, and paper (Bromley, 2010) to the current variety of digital apparatuses and their constraints on the acts of reading and writing (Alirezabeigi et al., 2020). This includes how they challenge the centrality of the written text, of the book, and even of the textbook (Marin et al., 2018) and suggests the onset of different relational possibilities with digital books and different constraints on the gestures of reading and making marks while reading. What follows focuses on what is immanent to the act of reading (Larrosa, 2010) and its inherently pedagogical nature, and on the ontological aspects of professional or liberal education (Fellenz, 2015).

There is a corporeal dimension to reading, and thus to marking. The gestures of the act affect those who read and mark while reading, leading to the internalization of the necessary actions to allow performing them physically at will (Flusser, 2014). There is the activation of the particular mechanisms of the brain that make reading possible (Dehaene, 2019; Wolf, 2018). Finally, to bring it all together, there is the sense of touch, handling, and coming to possess a book, as it becomes unique to us and is transformed from an 'it' to a 'thou' (Buber, 1937). This speaks to the relational dynamic developed between readers and books during reading and making marks while reading brought to life by the physical actions they entail: a performance (Zumthor, 1990), in that it comprises attitudes and gestures in pursuit of purpose (Flusser, 2014).

We write to share something that would have direct appeal to the novice: the fundamentals and rationale of how to make marks while reading. And yet, even the most seasoned among us may find something of interest in such an explanation of the fundamentals and rationale for marking while reading, even more so if we taught ourselves to mark.

We must begin by defining our terms and context. After a brief consideration of the practice of marginalia, we revisit Adler's 1941 'How to Mark a Book'. We then share the state

of the art of marking while reading, discussing its fundamentals and explaining its rationale, to argue that becoming a proficient reader who marks while reading for heightened understanding requires a change in method and in attitude. We conclude by discussing what, if any, changes might apply to our argument in the transition from marking on paper to digital texts.

2.2 MARGINALIA

Ever since the advent of written text, readers have written and drawn on their pages to record the results of their reading. Books would be found annotated at the margins – hence, *marginalia*. Lines, brief annotations in text like 'N.B.' (*Nota Bene*) are familiar to almost everyone who learned or was taught how to read deeply, earnestly, marking as they read. Marginalia were at the core of study: they shaped the intellectual world.

In a direct sense, marks bear witness to whatever moved the reader to the point of action, to making marks while reading. But marks represent more: they remain as traces of the relational connection between the original reader and the book, bearing witness to a particular moment, to a particular relation, to the encounter of one particular reader with a book.

The beginnings of our modern legal tradition can be traced to the Glossators who annotated Justinian's ancient *Corpus Iuris Civilis* in the 11th and 12th Centuries (Corpus Iuris Civilis with marginal glosses, 1558/1560). Marginalia were used to explain unknown expressions, resolve contradictions, and document and consolidate the study and practice of Law. Napoleon's personal copy of Machiavelli's (1999) *The Prince* discloses an array of marks and comments made over the decades. This habit is still kept by lawyers, medical doctors, and engineers, as they attempt to narrow the gap between the knowledge they find in texts and gain in practice. Much like we are shown by Harry Potter's borrowed copy of *Advanced Potion-Making* by Libatius Borage in *The Half-Blood Prince* (Rowling, 2006), far from detracting from the contents of shared school and university books, marks might even add to them.

However, in the wake of the requirement that one year's books be kept pristine so as to be handed over to the next cohort in primary, then secondary schools, marking became something to be frowned upon, forbidden (American Museum of Natural History, 2020). That ban, taught to young readers, slipped into university practice at the expense of the gains marking while reading provided students and scholars, a loss we seek to redress.

2.3 ADLER'S HOW TO MARK A BOOK

On July 6, 1941, Mortimer Jerome Adler published 'How to mark a book' in *The Saturday Review of Literature*. It was his answer to what he felt as the oppression of books accumulated, left undigested on so many shelves and in lending libraries. He sought to explain to the general public that they should read, and mark while reading, so they might read better and better themselves. Reading with a pencil in hand awakened the alert restlessness that asks questions, seeks answers, and exercises judgment. But there was more: it enabled reading to work to the betterment of readers by further allowing them to develop a relation with each book and make it their own.

Adler wrote for everybody. He gave practical instructions as to *how* readers might mark while reading. He suggested obvious signs, expressing a narrow gamut of reactions, whose meaning could be directly inferred: an asterisk for something important, an exclamation mark for surprise, an interrogation for doubt, lines along a margin for something memorable, numbers to follow the structure of the argument, and the rare underline for something truly remarkable.

2.4 BEYOND ADLER

Adler's suggestions served elementary schoolers for quite some time, prompting students to read attentively and record doubts and reactions while reading, thus laying the groundwork for an engaged attitude towards learning. Adler's proposition lets readers realize that books can belong to them and that, instead of strolling through them, readers can actually engage with the meaning they have to offer. Conversely, without it, they would be prone to let their gaze wander from the text, fail grappling with what it meant, and forget relevant points noticed while reading.

But it would be inappropriate to consider Adler's simple set of a half-a-dozen marks equally sufficient for advanced students, scholars, and professionals. Rather, it should be taken as intended, as something readers use, then grow out of, as they discover the need for marks that will allow them to register more varied and nuanced reactions.

2.5 APPRECIATING THE FUNDAMENTALS

We know what we are marking for when we number the parts of an author's argument, our 1, 2, 3 s that mirror the author's own structure, trace a line next to a passage and write a

couple of words, to record a definition and what it means, and memorialize something worth memorializing, all for the same reasons as Glossators did a millennium ago.

Yet, growing maturity in readers lends greater breadth to the process of reading and marking. So that simple asterisk we placed to signify importance now begets a symbol and some words to explain why it was placed. Conversely, single, double, treble common asterisks might come to rank in importance whatever is related to the contents of this particular text, to better grasp or digest what is being read. And we might yet use a star for something that connects deeply with our own concerns, accompanied by a dozen words, or even more, on the page's margins. And so on. As we readers change, the marks we make must change, too. Indeed, choosing a particular set of symbols and recording what symbols were chosen, and what they mean, is the first fundamental in marking.

At some point, the whole exercise becomes reflexive and even more idiosyncratic, and we begin to customize our marks. We will want the benefit of recalling our understanding of this particular text as it was when we read it. We will most likely want marks that allow us to contrast what we understood then with what we came to understand later or serve other functions: to refine support or disagreement with an argument or record the stages of our own evolving mastery of a given subject. There is no canon for what moves a reader or why. What moves the reader is a matter of the heart, even if it admits the concourse of what the intellect may add. As such, marks must now express agreement or disagreement with the book and signal changes in information, understanding, or thinking in light of what moves us.

If choosing and recording a set of symbols and their meanings makes for the first fundamental in marking, a change in attitude of why and how we mark makes for the second fundamental and we become collectors of sparks.

2.6 THE PRESERVATION OF THE SPARK

We mark while reading to engage with books in dialogue; as we do so, we may suddenly come to find, in ourselves, a new voice, a changed perspective, convictions reinforced or questioned, the solution to a problem we had been grappling with unsuccessfully, or even the discovery of a problem we never knew existed. Marks come to record and symbolize occasions of understanding, of thinking in dialogue with the book, and even of discovery. These findings rarely come about as finished ideas blessed with the gift of certitude, and their permanence in memory is far from assured. Nevertheless, their onset is usually striking, even

if the full measure of an insight or perception may not last long in our minds. That instant – which has many names, but let insight suffice – is what we call the spark.

What we call a spark, appears, at first sight, to be no more than a reaction to what was read, but there is much more to it. It is a qualified reaction, in that it reinforces the dialogical relation established between reader and book. Something has been read that evokes agreement, disagreement, or that qualifies or extends a given understanding. It is something new that leads to a moment of learning something novel, unforeseen. A spark is lived momentarily by a reader and is even more fleeting than the spoken word, unless it is exceptionally striking. It may turn out to be an answer, a revelation, or a perspective that can endure in a reader's mind. But there is no witness to it, save that one reader, and, initially, nowhere to preserve it, save in their memory. The more consequential a spark is, the greater care and elaboration recording its location, significance and implications requires, so that each spark be promptly and clearly preserved, lest it fade away, as it likely will, otherwise.

If we are to recall, at a future date, that spark we marked and why with the same level of clarity, fullness, and nuance we perceived while reading, it may be necessary to add a written note to that symbol. Further, if a given note is recurrent, we might as well give it a symbol of its own. And thus we come to organize our collection of sparks and of the symbols that come to represent each one, aligning categories with our interests and concerns.

Preserving the spark requires a recurrent feat of sleight of hand and mind together, *impromptu*, made fluent by practice. The symbols and written words must be set down quickly and lively, so we can seize and record the spark in the brief moment we still have it in full. The flash of the spark in our mind's eye and the train of thought it unleashes; the epiphany of its importance; the flick of the wrist and the scribbling of meaningful pairings of symbols and words, bringing it all together. Then we can behold the record of the spark, for further revision and perfection even as the spark itself fades. Once it is preserved through marking, we may add whatever else we may need to remember its cause, meaning, or significance. So that, at a later date, a mere glance allows us to effect an act of mental time travel, back to what we thought and felt when we marked. This is the ultimate purpose of marking while reading: the preservation of sparks.

It is through sparks that we become aware of moments in which reading allows us to reach for more varied, diversified, fruitful, and richer relations with the world. Sparks, in this sense, are the milestones (*Wegmarken*) on our path to *Bildung*, which come to signify more than the journey because they have also come to reflect the changed versions of ourselves during that process. We now know differently, perceive the world differently, in addition to what we

knew and perceived before: as such, we are enlarged. As we cross these milestones and record the crossing by making marks on text, we thus build an enlarged version of ourselves and over time we can contribute to an enlarged version of others and even of our community (Humboldt, 2017). Simply put, sparks may come to bring unto us something long known, discovered, or valuable, of which we were unaware. Conversely, they may ignite the flame of discovery or creation of something novel, that was never known, or had never been. In seeking to preserve sparks, marks admit differing motivations that, once identified, can lead to opportune and potentially useful distinctions.

2.7 EMOTICONS AND INTELLECTICONS

As scholars faced with the task of making marks which are enduring to us, we must learn to recognize not only our reactions to what we read on an intellectual level, but also, and perhaps foremost, on an emotional level, so that we might learn to cultivate the marks that come to symbolize both, so that their meaning is forever etched and fully recoverable in our minds. This admits to a measure of self-cultivation and to any number of attitudes that somehow lead us to perceive what makes us laugh, elicits empathy, indignation, or even indifference: in sum, a process in which we can enlarge ourselves through increased self-understanding, linking and reflecting upon our emotional and intellectual responses while reading.

The appreciation of the unacceptable consequences of an author's proposition might be recorded with something anodyne, a circled superimposed with a large X for error; with the emoticon of closed eyes in angry desperation; or with something else entirely, which evokes, to us, a sign, a scene, a memory lived and put to use through marking. And there is more to it: the cultivation of our own style, as we come across something with superior grace or clarity we would wish to collect and emulate.

Therefore, we must consider in the design of our own symbols and practices both the emoticon and, to coin a new word, the *intellecticon*, to allow us to vividly recall what we marked and why, as if to enable us to express our opinion directly to the author, if we ever came to meet. And, through our marks, we can make books our very own and thus take part in the Great Discussion of the West, and even beyond. This, indeed, is the miracle of dialogue through active, deep reading, brought about more vividly and remarkably by making marks while reading.

2.8 RATIONALE OF MARKING WHILE READING

We have situated marking while reading and briefly outlined its fundamentals through an extended exemplar. Learning those fundamentals, we argued, would require readers to make a change in process (e.g., by consistently adhering to a chosen individual standardized set of symbols) and in attitude (e.g., by seeking to identify and collect sparks). But this only tells half the tale. Our next step takes us to the rationale behind marking while reading, so that we might make better, more consistent marks, whose meaning we are easily able to recall, and, in doing so, we capture every spark, thus achieving fluency in, and later, mastery of an effective system.

The first element is the progression from a known, intelligible and consistent set of symbols and meanings to a *system of marks*. The second is the progression from an attitude in marking to identify and preserve sparks to a *policy for marking*. While it would appear that there is a measure of ambiguity that would make it hard to describe the differences between a set and a system, an attitude and a policy, this is most certainly not the case. What differentiates them is growing levels of purposefulness, which allow us to outline three distinct levels of proficiency that serve as a scaffolded approach for those who wish to improve their marks towards a more effective system.

A first level is shared by all of us at the start, when, as novices, we simply follow Adler's suggestions while preparing for a class. This is the apprenticeship of technique, which shows little to no purposefulness. It is procedure, the exercise of mechanics that exposes us to the fundamentals and, over time, educates our skills and judgment in making marks while reading.

A second level begins with the heightened awareness brought about by constant marking while reading. It builds on those same elementary fundamentals with growing reflexivity and purposefulness, because we have now consciously decided to choose one symbol over another; to mark sparks related to certain instances of information, understanding, or style while ignoring others; to use pencils or colored pens and to scribble or draw as needed; and, finally, to put all of those choices together. We can only arrive at what works for us through experimentation, failure, and re-experimentation. This admits to muddling through until we reach a particular result with the additional benefits of experience and hindsight. While this certainly leads to greater reflexivity in choosing and understanding what might have worked (or not), there is still a gap between our choices and reasons for making them. There is yet another measure of purposefulness towards proficiency in marking while reading: deliberate design.

A third level obtains when our imagination is harnessed into foresight: the ability to visualize the arrangement that will produce the best results prior to implementation. It allows us to recast the conscious choices in symbols and practices made before and adjusted through application into an integrated approach; to transmogrify, through an act of deliberate design, a set of symbols into a coherent system of marks and a set of procedures into a consistent policy for marking. As we follow from non-reflexivity in obeisance and discipline to making our own choices and from there to deliberate design, the issue has changed in essence: from the adjustment of parts to the cultivation of the whole, marking while reading to satisfy our purposes, following a process designed by us, and capable of producing results as expected.

We can tell and describe our system and policy to others and hear and appreciate others' systems and policies. But, in a larger sense we cannot learn, we cannot use, we cannot understand someone else's system and policy in full. This is more akin to an art, or rather to the work of an artist that composes according to a personal sense of sufficiency and beauty, either for their own satisfaction or to be shared with others. While contingent upon talent, technique, materials, and tools, artists' choices of theme, subject, composition, and style remain profoundly idiosyncratic. Indeed, it is often baffling for artists to explain why they chose one way or the other. In reality, the propriety of what has been done does not admit to assessment by someone else: all that matters is the end result (Gombrich, 1995). In the same way, when it comes to our system and policy for marking, while we might eventually benefit from punctual criticism of choices, we alone can adjudicate on their suitability and effectiveness to purpose.

2.9 THE IDEA OF MARKS: BRIDGING THE DIGITAL DIVIDE

But what of reading and making marks while reading on digital devices? We would begin by arguing that the fundamentals of marking as previously discussed still apply, constrained by the patterns of relationships developed between readers and books. However, it is important to consider that different relational patterns lead to the cultivation of different skills and virtues and that the ascendancy of marking while reading was intimately associated with the diffusion of the physical book and silent reading (Illich, 1993) and a world shaped by the centrality of written text as a conveyor of knowledge (Flusser, 2011a). This brings to light two issues we must contend with before we can usefully restate our argument: the implications of the changes in media and in the relative importance of deep reading as a habit. We will argue that important differences obtain between reading on paper and reading on screens because digital books are Flusserian technical images (Flusser, 2011b), and that those differences,

compounded by the relative loss of the habit of deep reading in contemporary times, would suggest the onset of different relational patterns, and, with them, of different associated skills and virtues, a process whose results are apparently beginning to show (Baron, 2015; Wolf, 2018). This will allow us to restate our original proposition with additional considerations regarding its possible consequences as a conclusion to this section and the article.

The idea that a change in prevailing technologies that enable understanding leads to further change in associated relational patterns and skills and virtues can be observed throughout history. Memorizing through pattern, ritual, or song allowed the preservation of information across generations before the diffusion of writing. However, the ascendancy of written text led to different requirements for one's memory: while it was still necessary to memorize symbols and rules, meanings and interpretations, all other ideas could be written down and easily recalled or preserved, and, as such, no longer had to be memorized.

How we care for a physical book that matters to us is shown in how we handle, store, and even mark it. As we cultivate the virtue of care while establishing or reinforcing a relation with that particular copy of that particular book, we transform it from an 'it' to a 'thou' in the Buberian sense (Buber, 1937, pp. 3 ff.). Now, this book, a hitherto fungible object, has been made unique by my attention, devotion, and marks. Its loss would not go by unnoticed. In contrast, devices and software used for reading and marking digital books are anything but unique and can be substituted for an exact replica, both in appearance and functionality. This has made all considerations of care for digital books and devices that support them moot, with the possible exception of a certain zeal arising from one's own financial constraints. This birth, change, or death of skills and virtues amounts to a change in *Bildung*, entailing further change in relational patterns: a process of mutual influence that values and promotes skills and virtues in tune with the new and leads to the decay or transformation of those associated with the old.

In addition to considering this change in *Bildung*, our explanation of the apparent greater difficulty in deep reading digital texts must also consider that what we have before us is not a book, but a Flusserian technical image (Flusser, 2011b), and that differences between one and the other go significantly beyond either one's corporeality or tangibility. The technical image of the book is not the book, for it is not a thing, but maybe, at best, a simulation of some salient aspects of the thing itself, such as the book's cover, page numbers, and allowing readers to flip through pages by programming page corners to react to a press or a tap.

We read digital books by interacting with an apparatus: a device with encapsulated software (Flusser, 2011b, pp. 4 ff.). When accessing technical images that display the text of a digital book, readers are reduced to the role of operators, since the inner workings of an

apparatus are mostly known only to its programmers. As such, digital reading can only happen insofar as the operator-reader stays within the confines of what the apparatus allows, as circumscribed by its encapsulating device, and as dictated by its program (Flusser, 2011b).

These confines impact the experience of reading a book in a number of obvious and less-than-obvious ways. Programmers' instructions break the text to fit the screen size, change fonts, reconfigure layouts, and define 'best' resolution, color, contrast, or brightness settings. They allow operator-readers to access specific parts of the text through predetermined functions such as FIND, highlight a particular textual attribute, or automatically generate text summaries. Furthermore, they create the illusion of choice brought about by the possibility of customizations, which are no more than self-selected additional restrictions (cf. Dobson et al 2015). Or, possibly even worse, they impose features such as viewing other readers' highlights regardless of choice or perceived usefulness (Jahjah, 2016). Due to their confined experience, digital readers miss out on much that a physical book provides in terms of paratext (Malone, 2015). Indeed, there is much that can be done with a physical book that cannot with its digital counterpart (cf. Baron, 2015, pp. 135–156).

Pushing buttons and tapping screens, as directed by instructions, while trivial acts in themselves, activate programs that can be extraordinarily complex. A simple touch produces its expected result by triggering a series of steps, most of which are opaque to the operator-reader. In contrast, pen or pencil, in themselves simple tools, admit to the most complex of possibilities limited solely by readers' abilities or imagination, from the scribble of an intellecticon to an annotation in longhand. In other words, in stark opposition to what pens or pencils might allow, apparatuses confine, trivialize, and standardize operators' agency. Therefore, when it comes to reading and marking digital books for understanding (as opposed to reading for information), this means less depth, less freedom, less possibilities, less invention, and arguably less discovery, a source of great concern for deep reading capabilities of future generations (Baron, 2015; Wolf, 2018).

Deep reading on physical books has always benefited from the possibilities offered by paper, pen, or pencil. The adequate simulation of those possibilities to allow effective deep reading on digital media would require apparatuses sufficiently unconstrained by their hardware and software features and the designs of their programmers. Short of this ideal, the possibilities for some kind of digital marginalia on this or that apparatus are given by circumstance, choice, and even by the popularity of any one model at a given time and place. The variety of devices that run Amazon Kindle software – an immensely popular format – are generally limited to four colors for highlighting and typed comments which can neither be readily exported for future

use nor read by competing programs (Mangen et al., 2019). This stands in opposition to a less popular, though relevant countercurrent of programs that better simulate the printed book on a number of apparatuses, such as those based on PDF files, and allow richer simulations of analog reading, especially when used in tandem with a sufficiently light tablet and an advanced stylus.

In sum, while pen and pencil on paper admit potentially endless possibilities, an apparatus is a programmed tool and can only function according to predefined inputs and outputs and produce results according to predefined conditions and interactions. Indeed, the greater its complexity, the less freedom it allows its operators (Flusser, 2000, pp. 21–24).

The primary challenge at crossing the digital divide has been broadly expressed as a concern for how one would cultivate the necessary skills and virtues associated with deep reading, but this is a problem whose significance is tied to the continued prevalence of deep reading as a fundamental or at least relevant technology that enables understanding (Hou et al., 2017). Will this change in *Bildung* obviate deep reading, and with it, marking while reading? For some, this might indeed be the case. Wolf (2018) argues that the popularization of digital books and the relatively lower density and complexity of digital texts at large (including social media) have led to cogent concerns for the loss of younger readers' ability to deal with deeper or longer texts. To complicate matters further, instead of cultivating associated skills through practice and nurture, the issue has been countered by doubtful solutions such as offering students smaller, easier works in lieu of having them deal with their difficulties when engaging larger, denser works, and coming to expect adequate results regardless (Baron, 2015, pp. 52–61).

So, what does this mean for marking while reading on digital texts? What does it imply for the applicability of the fundamentals and the rationale of marking as previously discussed? Our concluding remarks are two-fold, and hinge on whether, and how deeply, certain skills and virtues were cultivated by the reader, operator-reader to be(come), or not.

There are those who arrive at digital books with experience and appreciation for physical books, and, more importantly, for the cultivation of skills and virtues which support the patterns of relationships associated with deep reading. For those, we argue it is mostly the same under additional constraints. While those readers may come to disagree with decisions made by programmers that affect their reading, it is precisely their relational engagement to deep reading (and their cultivation of associated skills and virtues, e.g., their savviness) that allows them to keep themselves on track. Unsurprisingly, this is much akin to an artist adapting to digital media: a matter of dealing with what a particular apparatus does or does not allow, and how to circumvent, or alternatively to exploit its possibilities.

However, those who lack the experience, or to make the crucial point explicit, the relational engagement with physical books may face a daunting task. The issue might indeed lie, to a large extent, with deliberate practices or policies that favor digital books. They lead, unintentionally or otherwise, to the progressive suppression of meaningful experiences with physical books and the attendant loss of analog skills, denying opportunities that might lead to the development of the ability to deep read (Baron, 2015, pp. 80–85, also pp. 93–112). Regardless, some still optimistically advocate for arrangements that would allow children to harmonize analog and digital reading experiences and somehow open themselves to fluency, perhaps even mastery in required skills for both (Wolf, 2018, pp. 101–113).

Even so, after almost three decades reaching for the promise of digital books, digital marks still remain an unfulfilling simulation of the original experience. But this might not matter much. According to Flusser (2011a), a world in which technical images are prevalent in the organization of culture may very well come to dismiss text itself to a peripheral niche. Then again, if one is still concerned with deep reading, digital readers will somehow have to cultivate certain skills and virtues still constrained by apparatuses' features and programming. Therefore, it might be argued that they will find the fundamentals and rationale for marking while reading proposed here even more meaningful than before.

3. BRAZILIAN NATIONAL DEFENCE POLICY AND STRATEGY REVIEWED AS A UNITY

3.1 INTRODUCTION

The public, regular presentation of defence policies and strategies is one of the cornerstones of democratic governance and serves diplomacy to preserve, protect, and support international peace and security. Such documents are a polity's declaratory policy, playing substantial domestic and international roles. They matter on many levels, conveying a polity's intentions and objectives, alternatives and choices about ends, ways, means, and methods. As importantly, defence policies are essential components of the system of checks and balances and civil-military relations.

As defence policies express a polity's perception and direction as a whole, as a nation, they offer the opportunity of considering, furthermore, the role that defence preparations might play in development, in the well-being of the citizenry, in forming or enhancing their shared identity. They bring together aspirations and constraints, ambitions and restraints, ends desired and means required, the interpretation of the past and of what the future might hold. Defence policies serve, as a result, to communicate both how a polity perceives itself and how it perceives and wishes to participate in international society.

The Brazilian partnership in BRICS enhanced its international profile and elevated its role as a potential global player in the first two decades of the 21st Century. This has made Brazil's expression of its ambitions, intentions, designs, defence policy and strategy of global, and not just of regional, interest. *Política Nacional de Defesa* (PND, National Defence Policy) and *Estratégia Nacional de Defesa* (END, National Defence Strategy) correspond to the highest-level expression of Brazil's declaratory policy on defence. These are Brazil's strategic communication to the world as well as to Brazilians and to Brazilian armed forces, making them the paramount sources for appreciating Brazilian posture, projects, and prospects. What do Brazil's *Política Nacional de Defesa* (PND) and *Estratégia Nacional de Defesa* (END) say?

Two important caveats must precede their appreciation. First, it is neither possible to substitute their reading nor to summarize them in detail within the confines of a journal article. Second, this article is largely an annotated appreciation of the documents themselves. It accounts for their purpose and mutual influences, refraining from consideration of what they should or could be. Further, it does not contrast them with practice, what has been or is being carried out. What follows takes what the documents themselves indicate are their concerns.

The article begins by a review of the unity of Brazil's *Política Nacional de Defesa* (PND) and *Estratégia Nacional de Defesa* (END), P&E, which reports what it is about, what it says in general, and what and how it says it through examples of its details. This is followed by a policy review outlining how it might be interpreted through the lenses of Strategic Studies and Public Policy. Conclusions summarize and discuss the consequences of the article, qualifying its thrust.

3.2 AN OVERVIEW

The unity of *Política Nacional de Defesa* (PND, National Defence Policy) and *Estratégia Nacional de Defesa* (END, National Defence Strategy) expresses civil-military realignment of re-democratization. Brazil's first public defence policy (PDN, PND's predecessor) was published in 1996. It paved the way for the creation of the *Ministério da Defesa* (Ministry of Defence - MoD), turning the military ministries into subordinate commands. This was followed by END in 2008. PND and END were brought in line in 2012 and approved by Congress in 2013. Since then, the MoD presents PND-END as a unity – P&E (Brasil 2012).

Like many Brazilian capstone documents, P&E is acknowledged as the position of a given administration, but presumed to emanate from the state, transcending administrations. It is neither signed nor explicitly endorsed by any official – 'Brazil' is the author. The masthead lists president, ministers, and other officials' *nihil obstat*, but does not convey executive authority to contents or execution. This would require statutory attribution of exercise of constitutional delegated powers – that is not the case of P&E.

3.3 A SUMMARY REVIEW OF LITERATURE

In many ways, P&E (Brasil 2012) can be said to address the fact that the 1996 PND and 2008 END were written many years apart and lacked a clear hierarchy between them. From a broad perspective, P&E corresponds to a logical step in the path of Brazilian defence conceptualization and modernization.

P&E's thrust was, in fact, largely anticipated: both Brazil's international positioning (Fishman and Manwaring 2011) and the quandary it presented to Rousseff's administration (Bertazzo 2012). A comparison of END with capstone documents from other BRICS countries reveals analogous responses to very different circumstances (Bertonha 2013). Challenges persist as to P&E's own intended comprehensiveness (Cepik 2014). P&E can either be

perceived as another instance of Brazil's recurring strategic posture as a security free-rider (Proença Jr. and Diniz 2008) or as another instance of Brazil's difficulties in defence management, marked by institutional frailty before the military (Winand and Saint-Pierre 2010).

P&E incorporates greater alignment of defence with foreign policy, a matter notably absent from its earlier versions (Alsina Jr. 2003). It still chooses neither to engage with the issues of the use of force proper (Proença Jr. and Duarte 2007; Bertonha 2010), nor to relate to the conceptual criticism of its foundations (Rudzit and Nogami 2010), nor yet to take full responsibility for the Brazilian armed forces' constitutional mandate (Proença Jr. 2011a).

In what concerns industry and technology, P&E's assumption that technological promises lead to operational capabilities and development has been regarded as simplistic (Proença Jr. 2011b; Silva and Proença Jr. 2014), and P&E's expectation of smooth running defence acquisition, unrealistic (Bohn 2014; Franko 2014). Still, Science, Technology, and Innovation (STI) do emerge as a one of P&E's central pillars, arguably its clearest expression of the developmental counterpart of P&E to defence proper. Unsurprisingly, as it aims beyond the Armed Forces and the state, confidence and credibility may be held to beat least as important as feasibility and affordability (Martins Filho 2014).

END's 2008 version led to foreign policy consequences: the expectation of an increased role for military power supporting diplomacy (Alsina Jr. 2009) or increased Brazilian assertiveness (Wigell 2011). Congressional approval of P&E in 2013 amplified this effect: Brazil was deemed to have become a global player (Vitelli 2015). Some scholars wonder how far Brazil would go (Hirst 2015; Tepperman 2017), others how far Brazil could go (Cervo and Lessa 2014; Mares and Trinkunas 2016).

3.3.1 **P&E: an overview**

The Introduction to P&E reads: "PND sets the objectives for national defence and guides the state as to what to do to reach them. END, in turn, establishes how to achieve it. Together they pave the way to build the defence Brazil aspires to" (Brasil 2012: 7).

PND is "the highest-level planning document for defence under the purview of the MoD" (Brasil 2012, 11), and essentially concerns itself with external threats. While it acknowledges domestic security responsibilities of the Armed Forces, these are remitted to specific legislation (Brasil 2012, 35). PND conceptualizes 'security' as "the condition that allows the country to preserve is sovereignty and national integrity, to promote its national

interest free from pressures or threats, ensuring its citizens the free exercise of constitutional rights and duties" (Brasil 2012, 12) and 'national defence' as "the set of measures and actions of the state, particularly military, for the defence of the territory and national interests against preponderantly external, potential or actual threats" (Brasil 2012, 12). PND's seven chapters provide definitions of the international, regional, and national environments and propose eleven 'national defence objectives' followed by 'guidelines.'

END presents itself as "inseparable from a national development strategy" (Brasil 2012, 43), "the link between the concept and the policy of national independence, on the one hand, and the Armed Forces to safekeep that independence, on the other" (Brasil 2012, 45). END comprises a wide-ranging variety of thematic chapters, grouped into 'Systematic Formulation', which deals with END itself, and 'Implementation Measures.'

No description of what P&E says in detail can avoid dealing with the tensions it contains. P&E presumes that PND subordinates END. Yet END is broader, and more far-ranging. END is linked to an all-encompassing concept and policy of national independence (Brasil 2012, 45), counterpart to a national development strategy (none of the latter available as of 2017). END belongs to a network, while PND does not. PND defines eleven objectives. END would have to refer to them explicitly — it does not. Rather, END formulates its own objectives — some as broad, if not broader, than PND's. END sometimes expresses goals in its own fashion so as to best explain what is to be achieved or should come to be achieved, as self-standing desired attributes, capabilities, or end-states.

Doing justice to PND's eleven objectives requires a full quotation:

> I. To guarantee sovereignty, national assets and territorial integrity.
> II. To defend national interest, Brazilian citizens, goods, and resources abroad.
> III. Contribute towards the preservation of national unity and cohesion.
> IV. Contribute to regional stability.
> V. Contribute to the maintenance of peace and international security.
> VI. Enhance Brazil's projection in the concert of nations and its greater participation in international decision-making processes.
> VII. To keep the armed forces modern, integrated, trained and balanced, increasing their professionalization, operating in joint fashion while being adequately distributed over the national territory.
> VIII. To raise awareness within Brazilian society of the importance of defence subjects.
> IX. To develop the national defence industry to obtain autonomy in indispensable technologies.
> X. To structure the armed forces around capabilities, providing them with personnel and materiel compatible with strategic and operational planning.
> XI. To develop the potential of defence logistics and national mobilization (**Brasil 2012**, 29–30).

As these would constitute the loadstone of all Brazilian defence activities, they admit a first cut appreciation.

Objective I would appear to echo Article 142 of the Brazilian Constitution, that reads:

> The Armed Forces, made up of the Navy, Army and Air Force, are permanent and regular national institutions, organized on the basis of hierarchy and discipline, under the supreme authority of the President of the Republic, and intended to defend the Nation, guarantee the constitutional branches of government and, on the initiative of any of these branches, law and order (Brasil 1988).

In choosing "to guarantee", rather than "to defend" (as above) in Objective I, a measure of nuance is introduced. Guarantee is construed as to uphold when and if required, which is a curious way for P&E to frame its primary objective.

Contrariwise, the choice of "to defend" national interests, goods, and citizens abroad in objective II would signal a mandate for military power projection, which would seem to some extent at odds with principles IV ("non-intervention") and VII ("peaceful solution of conflicts") of article 4 of the Brazilian Constitution (Brasil 1988).

P&E's Objectives III, IV and V's choice of "to contribute" and objective VI's of "to intensify", as much as objective VIII, "to raise awareness" are calls for activity – not achievement. Almost anything can be regarded as contribution, intensification, or as raising awareness, and thus it is not immediately clear what they propose as direction or how results could be assessed.

Likewise, objectives VII, X, and XI address the Armed Forces through a description of desirable attributes or end-states. Objective VII requires "keeping" the Armed Forces "modern, integrated, trained, and balanced, and with increasing professionalization, operating jointly and adequately deployed on the national territory" (Brasil 2012, 30) which begs the question of what each of those terms denotes. Objective X requires "structuring" the armed forces "around capacities", giving them personnel and materiel "compatible with strategic and operational planning [*sic*]" (Brasil 2012, 30). It is not obvious how else the Armed Forces could be structured, and the plea for compatibility with planning is troublesome in itself. In the absence of goals that would give purpose to such planning and political choices of how to pursue them, it might as well be admitted that objective X raises more questions than it answers. One way or the other, objective XI: "developing the potential" of defence logistics and national mobilization — is another curious choice of words, setting as objective the development of potential, and not logistics or mobilization proper, and again begging the question of how to assess an activity, as well as about its purpose in distinguishing potential from actual.

Objective IX requires developing the national defence industry "so as to obtain autonomy in indispensable technologies", which admits a plain text reading of autonomy while deferring to a later unspecified date [defining?] which technologies would be deemed indispensable.

The guidelines range from advertising *ad hoc* arrangements to deal with international crisis or war, through the role of the Armed Forces and of conscription, to concerns (the Amazon, e.g.), to staking claims as to the purpose and direction of defence-relevant domestic (technology, e.g.) and foreign (strategic partnerships, peacekeeping, e.g.) policies (Brasil 2012, 31–3).

Moreover, it remains unclear whether objectives and guidelines are to be sought or followed *at* the direction of a given administration or to serve *as* direction to a given administration.

The two following parts of P&E amount to an omnibus of largely self-contained chapters, that share a variety of visions and perspectives, communicated by descriptions, lists, desiderata, and sets of desirable attributes or end-states.

Three "structural axes" (Brasil 2012, 65–6) would seem to provide the framework for the presentation of "Systematic Formulation": a. the reorganization, reorientation and personnel and materiel policy of the Armed Forces; b. the Defence Industrial Base; and c. the personnel composition of the Armed Forces.

The first structural axis is addressed by three chapters that describe the strategic objectives and individual perspective of each of the Armed Forces. While each chapter has provisos for joint action, there is no chapter that accounts for the joint view each of the other chapters might appear to assume. The Navy identifies tasks, giving paramount attention to sea denial – the prevention of any hostile concentration approaching Brazil by sea – and admits to power projection as a corollary (Brasil 2012, 67). The Army enunciates principles of flexibility and elasticity, which translate into the ability to employ force commensurate with circumstances or, alternatively, to increase its numbers through mobilization (Brasil 2012, 75–6). The Air Force provides a chain of nested dependencies that go from (a) aerial surveillance, that enables (b) desired control of the air, which in turn allows (c) the ability to fight in particular points of the national territory, which as a result configures (d) required capabilities, which are wholly independent of any particular opponent (Brasil 2012, 85–8). Each chapter sticks to the abstract development of its premises and offers no organizational or material detail of the means that would correspond to alternatives that would pursue or achieve its strategic objectives.

The second structural axis understands that Brazil's *Base Industrial de Defesa* (BID, Defence Industrial Base (DIB)) would have to be reorganized in totto, prioritizing (a) the development of independent technological capabilities (b) the subordination of commercial concerns to strategic imperatives, and (c) the avoidance of polarization between routine and advanced research; further, it would be involved in translating results into operational capabilities (Brasil 2012, 99–100). This amounts to the prescription of desired permanent boundary conditions or desired end-states with no organizational or material detail.

The third structural axis demands that the personnel composition, in conscription and in the armed forces themselves, must remain a faithful mirror of the makeup of Brazilian population as a whole "so that the Nation might find itself above social classes" (Brasil 2012, 66).

The conclusion of "Systematic Formulation" is assertive, sure, and certain of its feasibility as a result of "the almost unrestricted capacity for adaptation that infuses Brazilian culture" and "the profound identity between Nation and Armed Forces" (Brasil 2012, 109). "Implementation Measures" is also divided into three parts: (a) context, so as to refine objectives and explain methods; (b) application, a sampling of the classes of problems of the Armed Forces; and (c) the strategic actions that would take Brazil from where it is to where it should be, followed by a chapter of final dispositions.

Context has a single chapter, that reiterates the conclusion of 'Systematic Formulation' while presenting – juxtaposing – lists of positive aspects (the identity between Nation and Armed Forces, e.g.); vulnerabilities (the lack of involvement of Brazilian society with defence affairs, e.g.); and the large list of opportunities that range from the abstract (the greater engagement of Brazilian society, e.g.) to the requisites of administrative legislation (centralized procurement, e.g.) (Brasil 2012, 113–7). Oddly enough, there are no threats.

'Application of strategy' is a sub-part with no introduction or conclusion that gathers five chapters. These range from a few pages, structuring of the Armed Forces, e.g. – which provide lists of relevant considerations, concerns, steps or alternatives (Brasil 2012, 123–8), to a single paragraph, 'Guarantee of Law and Order', e.g. – that refers that constitutional mission to legislation (Brasil 2012, 129).

'Strategic Actions' is also a sub-part with no introduction or conclusion with chapters that range from a few pages, Science, Technology and Innovation, e.g.– that provides lists of demands, claims, and parameters (Brasil 2012, 71–3), to a single paragraph, 'Public Relations', e.g. – to enhance Brazilian "defence mentality" following MoD's initiatives (Brasil 2012, 152).

Final Dispositions close P&E, aggregating a schedule of activities that will flesh out P&E, from the first item (Acquisition Plans) that ranges from 2012-2031, to a dozen other items that may depend on collaboration with other agencies, with milestones set for 2013 or 2014. Its final paragraph opens with the admonition "END and its resulting documents will be complemented by annexes", while only proposing as such the hypotheses for use of the Armed Forces (Brasil 2012, 155).

This suffices for an over glance of so large, ambitious and varied a document as P&E.

3.4 P&E THROUGH THE LENSES OF STRATEGIC STUDIES AND PUBLIC POLICY

The following offers an analysis of P&E through the lenses of Strategic Studies and Public Policy, outlining how P&E might be read by polities or agencies.

3.4.1 **Strategic Studies: ends and means**

The lens of Strategic Studies is germane as to how polities or agencies would read P&E. Strategic Studies are concerned with the use of force to resolve conflicts that admit resolution by what the use of force may achieve (Brodie 1949; Gray 1977). Strategic Studies are about war as a phenomenon: the use of force to compel (Gray 1999) – the use of (the results of the use of) the means of force to pursue political ends (von Clausewitz 1976; 1981). This leads to an absolute requirement. Ends and means must be explicit, and clear enough so that it is possible to answer which means to achieve these ends or which ends can these means achieve (von Clausewitz 1976; 1981; Davis 1994; Gray 2014).

Once preferences and priorities in ends and means are a given, the issue becomes that of governance of defence, in the strict sense of allowing government to govern the armed forces, their supporting apparatus, and war itself (O'Hanlon 2009; Gray 2014). Governance requires (a) a defence policy that enunciates preferences and priorities for the ends it might pursue and the means of force that would pursue them, (b) force design that would provide those means, and all else required to enable, support and sustain them in preparation and/or use and (c), direction and command that allows the day-to-day supervision and situated adjustment of preparation and/or use. Very few other nations propose to deal with the matter in so comprehensive a manner as P&E aspires to do for Brazil. This is an empirical observation, not an epistemological assumption. In fact, P&E would only admit comparison with documentation from major nuclear powers. This makes it opportune to illustrate the issue by a brief outline of US and Russia's arrangements.

In the USA, the capstone document is the annual "National Security Strategy", signed by the president, that identifies preferences and priorities in terms of political concerns (ends) and ways to address them (means) (USA 2015). This gives authoritative direction to a bi-directional flow under a variety of controls, both political and technical: top-down, all the way to individual administrative offices, firms or combat units and *bottom-up*, reporting what can, may, and might be achievable, improving implementation and informing the next iteration (Spinney 1985; Quinn 2015).

In the Russian Federation, the matter is more unilaterally top-down. "The Military Doctrine of the Russian Federation", an expression of presidential decision expected to last a decade, lays down in detail a whole multi-dimensional matrix of ends and means (Russian Federation 2014), providing specified conditions, preferences, and priorities that articulate preferred, accepted and prescribed ways and methods (Sinovets and Renz 2015). Complementary top-down plans like the *State Armament Program* outline decades-long procurement, specifying means, down to the individual models to be acquired (Renz 2014; Galeoti 2017).

The issue here is that there are many ways to digest the requirements of Strategic Studies to conform to the administrative realities of a given polity. Regardless, each polity, each agency, will read P&E as counterpart to its own way of doing things (Booth 1979) — but relying on Strategic Studies as touchstone for any reading of P&E's strategic meaning (Gray 1993; 2014; Millet and Murray 2007; O'Hanlon 2009).

P&E is comprehensively top-down, a closer parallel to Russia than to the USA. Its chapters express things as P&E understands them to be (Brasil 2012, 17 ff.), as they should be (Brasil 2012, 31 ff.), as they might be (Brasil 2012, 91 ff.), as P&E would wish them to be (Brasil 2012, 109 ff.). More broadly, what P&E wishes Brazil would care *for* (Brasil 2012, 129 ff.). Each chapter is largely self-standing, deeply concerned with its own particular theme, reporting in varying detail its own inner tensions.

For instance, admitting to power projection, but only under the UN, but not so much as to take it as an actual commitment to collective defence (Brasil 2012, 33). Or presuming the certainty of Brazil's pacific ascendancy to international primacy, but without hegemony – aggrandizement through harmonious relationships (Brasil 2012, 41). Or yet gathering in a single chapter lists to guide future joint staff planning that outline possible concerns, parameters or goals, ranging from the abstract (combat power that lends credibility to deterrence, e.g., Brasil 2012, 124), to possible procurement priorities (transport helicopters, e.g., Brasil 2012, 125), to deployment (specific to each force, e.g., Brasil 2012, 126–7), arriving at desirable capacities

(permanent readiness, e.g., Brasil 2012, 128), but without de-conflicting demands (ready forces' requirements conflict with those which are expandable by mobilization, e.g., Brasil 2012, 128). Or, further yet, offering the comprehensive variety of items which other agencies would procure for defence, such as funds and political constancy to develop whole chains of scientific, technological, manufacturing, and operational development capabilities (Brasil 2012, 139–40). Despite the appearance of detail of some of these items, they emerge as alternative ways for deferring preferences or priorities as they lack focus, explicit inter-agency connections, or executive authority. This explains the impossibility of a review of the ensemble beyond this mosaic-like sampler.

P&E ultimately declines to provide preferences and priorities concerning ends and means. By presenting activities as 'objectives', by juxtaposing desired attributes or end-states, collecting lists for future implementation, alternative courses of action, or parameters without de-conflicting their demands, or yet by pleading for results that are to be obtained by other agencies in favor of defence, P&E preserves considerable freedom of action. Chapters advertise what P&E cares for, what it might consider, what it might do, what it would wish for, implicitly adopting a "wait and see" posture that obviates immediate commitments, efforts, or expenditure. This does lighten the load on staffs and executives by postponing the messiness of scheduling and budgeting, avoiding the difficulties of setting up controls or having to define terms and methods for its own evaluation.

Freedom to act "when and if," however, leaves in suspense what is to be done starting now. Presumably, decisions will be made at some point, with enough lead time in advance of the if becoming when, lest one be unprepared as when becomes now. This posture would seem to rely on Brazilians' capacity for adaptation (Brasil 2012, 109) or to presume very reliable and timely advance warning, which might be an underlying, undisclosed premise of P&E.

Further, to leave agencies free from direction or tutelage for a considerable time, without clear politically established preferences or priorities in ends or means, risks autarchy and self-serving dysfunctions. P&E does not consider the possibility that inertia and bureaucratic empire-building might predominate, exacerbating intra- and inter-force rivalries, straining civil-military relations. This would appear to assume self-guided and harmonious intra- and inter-agency cooperation, perhaps depending on the unity of Nation and Armed Forces (Brasil 2012, 109) or on other underlying, undisclosed premises.

This might be corroborated by the way P&E deals with the DIB, which is to be reconfigured from the ground up. The whole matter is held hostage to, and elaborately expresses, the notion of a command economy. DIB would be confined to the development of

independent technologies, divorced from the globalized network of science and technology, while subordinating commercial concerns for profit to strategical imperatives, requiring concurrent routine and advanced research and manufacturing activities. Further, DIB would answer at least in part for the development of operational capabilities (Brasil 2012, 99–100), as well as presumably spinning off its results into national development, fulfilling END's development counterpart (Brasil 2012, 45) by realizing its STI mandate. DIB's chapter on 'Implementation Measures' is a single-item agendum for MoD lobbying so other agencies might enhance special funding and export treatment of defence firms (Brasil 2012, 145). As in any command economy, those involved or interested can be expected to jockey for favor, buck up for opportunities and keep an eye open for the main chance, while expecting to be adequately rewarded for playing along as much as for any, eventual, result. There might be underlying, undisclosed premises here as well.

While P&E's "wait and see" posture might come to prove an interesting experiment in the fullness of time, it is not quite so obvious how it would actually guide action in procuring means to seek ends or gauging ends reachable by existing (or prospective) means in the present. Nor, consequently, how P&E could establish governance of defence to enable direction and command of day-to-day activities. Without clear expression of politically decided priorities and preferences of ends and means, there is really nothing substantive to say about P&E through the lens of Strategic Studies, other than noting and qualifying their absence.

Regardless, what then might be the reading of P&E by polities and agencies, by those who have to assess it or implement it?

3.4.2 Public policy: the (in)effectiveness of political intent

The lens of Public Policy is germane as to how various involved parties would read P&E, which requires the appreciation of what needs to be considered so that decisions, actions, and control are effected legally, legitimately, and accountability. Public Policy is concerned with the issues and executions of a mandate, particularly, as to how a given direction supports the formulation and execution of undertakings in the public sphere, according to the public interest in democracies — how political intent can be translated into effective and accountable actions (Moran *et al.* 2006, 3 ff). That being said, the particulars of each specific field of application must be considered. In what concerns Science, Technology, and Innovation (STI) – for its importance as explicitly stated in P&E –, the matter of policy depends on governments' ability to engage the private sector in developing a shared vision for the future: the societal

challenges that must be met, what might be developed to meet it, and how that would serve the interests of all involved (Evans 1995; Stiglitz and Wallsten 1999; Fiani 2013).

The USA is the core of a global network of defence-driven innovation. Its arrangements, particularly of the relations between the defence establishment and the defence industrial base (Weiss 2008), are not only the most expansive and comprehensive (Block 2008; Freeman 2015), but also in a very real sense the touchstone of all efforts by other polities. In more ways than one, US practice is often taken as the state of the art (Fagerberg and Mowery 2006; Weinberger 2017). The USA goes farthest and deepest in publicly enunciating its societal challenges, explicitly connecting its defence needs, defence activities, technological research, and business sector — the "industrial-military complex" (Dieter 2015).

The "Small Business Innovation Research" (SBIR) is a case in point. SBIR was completely overhauled in the 1990s at a confluence of concerns, namely, the loss of technological competitiveness of the US economy against Japan and Germany, the longstanding political aim to stimulate small businesses, the recognition — and concern for the disappearance — of a large number of small high-technology startups that were both key to the vision the country held of itself and an integral part of the strategy to bring it to fruition (National Research Council 2008). How the US armed services perceive, implement, and place SBIR within overall defence activities (National Research Council 2009; 2014) offers an opportune illustration of how the specificity of the field can transfigure a sensitive expectation of what is at stake in linking STI Public Policy to defence.

SBIR is a good example of how the US armed services square the contradictory demands and dynamics of R&D and procurement (Edquist *et al.* 2000; Connell 2006) through systematic Test and Evaluation (T&E) (National Research Council 2014). One thing is Research and Development (R&D), which entails the highest level of technological risk – failure is a possibility in any one project. Failure in R&D demands reports; but it is not – and should not be – legally actionable, that is, failure does not expose researchers or developers to legal action. Another is procurement: what will be bought by the armed services with the expectation of "zero" technological risk: the item delivers the expected performance over its life cycle. A failure in delivering such performance is – and has to be, in fact – legally actionable (Dimitri *et al.* 2006) – it is a breach of contract. While it might appear that an STI policy in touch with defence would require the introduction of technological risk into defence procurement, that is not the case at all (National Research Council 2009).

Acknowledging such a divide, the USA has established, in the wake of the 2005 series of reports by the National Academies of Sciences, points of contact, individuals who answer

for the connection between procurement offices and research institutions whose purpose is to "square" the circle between R&D and procurement in a given general area (naval aviation, NAVAIR, e.g., in the case of the US Navy). In other words, persons whose role it is to bridge the gap between one and the other through conflict resolution and by matchmaking between smaller companies tasked with R&D and large defence contractors, possibly interested in, though often unknowing of, research results, that have the necessary experience in meeting the stringent, even overbearing, manufacturing and operational requirements of materiel procurement between these two parties and acquisition program managers where additional funding for the next level of T&E may be found (National Research Council 2009; Lessa 2014). This reduces the technological risk of R&D over time to the point when these technologies can be successfully integrated into a procurement program (Office of Naval Research 2008; National Research Council 2009).

This informs and serves all three main parties involved. It tells researchers what problems the armed services would like to see solved, and why. It qualifies what the armed services might come to ask in light of technological promises and dead ends, and it allows policymakers and agencies to cumulate learning over the whole cycle. Just as importantly, it identifies what problems cannot be solved, what may not be asked for, what there is still to learn (Office of Naval Research 2008). The whole is mediated by individuals empowered to act as honest brokers, using various controls, most notably robust Test and Evaluation (T&E) at scheduled milestones. The results of testing and evaluation support judgment on the promise, feasibility, or opportunity of any one particular technological solution. Dual-use and profitability, in turn, are a shared concern. Each party knows it stands to benefit should any one technology that stemmed from pursuing solutions to defence needs successfully find profitable applications in private markets. Granted, it benefits each of them in different ways: for instance, defence establishments gain from the familiarity and reliability for defence products in terms of military recruitment and training (National Research Council 2009; 2014).

When it comes to STI, the learning process itself can be — and most often is — paramount. In fact, most of STI policymaking is the art of formulating controls that support systematic evaluation, rather than choosing what to develop (Georghiou *et al.* 2014). This – rather than the setting of broad general goals (a political decision), specifying particular performance or capability (a military decision), pursuing the most promising or intriguing line of investigation (a research decision), or effecting controls, evaluations and passing judgment (an agency's decision) – is the core of the matter when it comes to any informed proposition or appreciation of STI policy in defence.

The issue here is that there are actually only very few ways of digesting the state of the art as administrative reality (Rodrik 2007; Lember *et al.* 2013). All polities and agencies use the US experience as their lens to read Public Policy of STI related to defence – including the reading of P&E.

And yet, P&E would appear to take this seemingly inescapable aspect of STI policy in defence for granted, almost approaching a positivist understanding of science, technology, or innovation, by which the clear expression of ambitioned goals ensures their achievement if efforts are adequately funded for long enough. Most of P&E's considerations regarding STI correspond to demands that others must meet, with the participation or at the request of the MoD. These include strategic partnerships that will grant access to technologies (Brasil 2012, 138–9) or the various integrating poles that, once established and funded over the long-term by other agencies, will achieve goals as broad as autonomy in technology and manufacturing of "smart weapons" (for sea, land, and air) or as narrow as the individual soldier's suite, e.g. (Brasil 2012, 139–40). Further, there are sweeping expectations of technological autonomy in fields like aerospace, conventional and nuclear submarines, or "cybernetics" (Brasil 2012, 139–43). P&E seems to expect the MoD's interests in science and technology will shape Brazil's national policies (Brasil 2012, 140–4). P&E would appear to make the same assumption in STI as in DIB: aspirations, expectations, and requests of a command economy that will achieve desired end-states or attributes – perhaps relying once again on Brazilians' ability to adapt and the unity of Nation and Armed Forces (Brasil 2012, 109) or on other underlying, undisclosed premises. As a result, through the lens of Public Policy in general, and STI in particular, P&E would appear to be either beyond redemption or, alternatively, to aspire to novelty and autonomy in method as much as in technology.

It would seem beyond redemption if there were no controls to square away the different interests of the parties involved, with R&D and procurement being treated as an indivisible continuum. Acknowledged divergent interests of the parties, mediated by an honest broker, resolving conflicts and issues of performance at each stage are not an optional extra when it comes to STI policy. The lack of sufficient controls (of robust, scheduled T&E, particularly) may fail to account for, record and allow for the institutional, shared systematic appreciation of what went well, and why - and, perhaps more importantly, – of what went wrong, and why. To fail to differentiate R&D from procurement, furthermore, may unwittingly limit legal liability and prevent the effect of market forces, halting the process of accountability or selection that rewards success and punishes failure – potentially placing policy, and policymakers, on a very slippery slope.

As for autonomy in method, one point stands out that should suffice to convey its boldness: P&E's spousal of verticalization. It is not entirely convincing that a fully verticalized, general, hierarchical and national supply chain that would depend exclusively on domestically sourced materials and capabilities would surpass in effectiveness or efficiency the currently preponderant network of distributed, specialized, market-driven and globalized arrangements. In proposing an approach that would unify all of research and development, manufacturing, procurement and development of operational capabilities in a single hierarchical structure to be guided by strategic imperatives, P&E would, if successful, break new ground, innovating in innovation, perhaps giving a new lease of life to conceptions held dear in the early stages of mass production. Here as in the matters of legal action, or the play of market forces, it might well turn out that P&E would again rely on Brazilians' capacity for adaptation and unity of Nation and Armed Forces (Brasil 2012, 109) or on underlying, undisclosed premises.

Regardless, what then might be the reading of P&E by polities and agencies, by those who have to assess it or implement it?

3.5 CONCLUSION

Brazil's capstone direction for defence, the PND and the END were approved by Congress in 2013. Presented as a unit (P&E) ever since, it constitutes a landmark in the process of Brazilian re-democratization and authoritatively expresses Brazil's official declaratory policy in defence, the most up-to-date presentation of Brazil's ambitions, intentions, and activities. It corresponds to an exercise in transparency that enlivens links with Congress and with Brazilian society – raising awareness of defence issues. P&E presents itself as but a facet of a wider conception that would connect strategies of defence and development under the concept and policy of a policy for national independence to the Armed Forces, whose mission would be to safeguard it (Brasil 2012, 45).

The definition of priorities, the establishment of foci in the pursuit of P&E – agency in its full breadth – are formally invested in the *Ministério da Defesa*. P&E conveys a broad, inclusive concern for the many facets it considers germane to the defence of Brazil. It composes a variety of elements: definitions, concerns, approaches, admonitions, and desiderata, pleas for mechanisms or initiatives by others that would deliver its wishes through national defence objectives or self-standing intents, cautions, lists, desired end-states, capacities, and aspirations. It seems much is expected from Brazilians' capacity for adaptation and the benefits of the unity of nation and Armed Forces (Brasil 2012, 109). P&E's formulations consistently preserve

freedom of action, expressing a posture of "wait and see." This would be in harmony with the absence of either preferences or priorities concerning ends or means, resources or finance and also coherent with P&E's implementation timeframe of 2012-2031 (Brasil 2012, 153 ff.), as well as with the sweeping deferral of any outstanding issues to annexes as yet to be written as of 2017 (Brasil 2012, 155). This does leave unanswered how P&E would propose to establish governance over its activities, evaluate its results or provide for oversight of its expenditures, which would appear to merit some importance, given that defence is already one of the top three lines of the Brazilian Federal Budget.

To focus on the absence of priorities and preferences regarding ends and means in P&E through the lens of Strategic Studies might not be entirely fair. It might well be the case that P&E does not propose to arrive at any such. This might be in accordance with the posture of "wait and see" that preserves freedom of action, postponing commitments until "when and if ". However, this practice does raise some cogent concerns as to P&E as a guide for immediate action, namely, what is to be done until "when", as much as it would seem to presume very reliable advance warning to know it. Granted, this might ensure P&E's longevity as the broad expression of Brazil's aspirations. Until priorities and preferences regarding ends and means are decided upon, the contribution of Strategic Studies is limited to noting their absence.

Similarly, it might be of little practical consequence that P&E's aspirations and imperatives touching Science, Technology, and Innovation would seem to be either beyond redemption or amount to an innovation that seemingly enlarges the state of the art of Public Policy. This might do well for the uplifting posture of reaching for the stars and hoping for the best – inspirational, if nothing else – by aiming at innovation in innovation, and autonomy in method as well as in technology. Alternatively, it may be admitted, that, at some point, it might turn out to be the case that the pressing concerns of developing countries preclude making the distinction between research and development from procurement, for all sorts of reasons. However, it does raise some cogent concerns as to its feasibility, as well as to its prospects. It might well be that P&E presumes that actual implementation, cumulative practice, and repeated interaction will lead to a sufficient measure of experience and adaptation, perhaps even learning.

This article offered a first cut at the contents of the 2013 proffered unity of Brazil's *Política Nacional de Defesa* and *Estratégia Nacional de Defesa*, P&E in short, and discussed how these might be understood through the lenses of Strategic Studies and Public Policy in Science, Technology, and Innovation and thus come to be read by polities and agencies. Part 3.2 offered an overview of P&E against the backdrop of a literature review (A Summary Review

of the Literature) (3.3): what it is about, what it says in general, and provided examples of its details (P&E, an Overview) (3.3.1). Part 3.4 offered a policy review of P&E, outlining how it might be interpreted through two lenses. The lens of Strategic Studies acknowledged that it could do no more than note and qualify the absence of preferences and priorities in ends and means (Strategic Studies: Ends and Means) (3.4.1). The lens of Public Policy comprehended the assumptions that P&E makes regarding Science, Technology, and Innovation, which would admit to being either beyond redemption or the aspiration of innovation in method as well as in technology development (Public Policy: the (in)effectiveness of political intent) (3.4.2). Part 3.5 offered conclusions and discussed some of the consequences of the article. Defence policy and strategy are not trifles. They pose serious challenges with grave, far-reaching consequences both domestically and for international relations. And yet, formulating policy means making choices; those it favors are pleased, but everybody else is not. P&E leverages what is, might or could be, artfully skirting this pitfall. If anything, the breadth and scope of Brazil's authoritative declaratory defence policy does suggest a broad agenda for public discussion, political debate, and scholarly interpretation.

4. A TRAJETÓRIA DAS DIVISÕES PESADAS DA URSS E RÚSSIA E DOS EUA AO INÍCIO E AO FINAL DA GUERRA FRIA

4.1 INTRODUÇÃO

Nos anos finais da Primeira Guerra Mundial, a motorização e a introdução do tanque como um novo armamento reconfiguraram as possibilidades no combate terrestre. Seu efeito e potencial impuseram um repensar sobre como compor as armas combatentes (infantaria, cavalaria, artilharia) e mais ainda sobre como articulá-las no combate.

Enquanto concepção, motorização e tanques expressavam um novo e mais avançado estado da arte bélico que em pouco tempo passou a ser partilhado por todos os países. Por isso, e diante das vantagens que prometiam, dali em diante todo projeto de força procuraria deliberadamente dar conta de organizar, equipar, treinar e manter forças combatentes capazes de dispor e fazer uso da motorização e dos tanques.

Entretanto, a adoção de um projeto de força diante desse estado da arte partilhado estava sujeita a fatores contextuais e situados próprios de cada país. Havia questões políticas: escolher quais forças ter e por que, para lutar contra qual oponente? Também havia os limites materiais e humanos em cada um.

Embora as principais potências soubessem das vantagens conferidas por armas combinadas motorizadas que dispusessem de tanques e, justamente por isso, ambicionavam tê-las, isso não era tão simples assim. Na verdade, restrições de contexto e situação podiam levar a resultados muito distantes do que se tinha ambicionado à luz do estado da arte. E, quanto mais distantes os resultados, maiores eram as chances de nem se ter e nem se poder usar armas combinadas, fosse pela falta de armamentos, veículos motorizados ou tanques adequados, fosse por não saber compô-los em organizações capazes de conduzir e sustentar a luta.

Isso porque estar no estado da arte exige mais que ter ou ser capaz de produzir determinados armamentos.

Para ter e poder usar armas combinadas aproveitando as vantagens que elas podem conferir é preciso dispor de tropas com competências diversas, inclusive a de saber agir coordenadamente, e de uma ampla variedade de equipamentos para lidar com diferentes situações. Mais ainda, é preciso dispor de quantidades suficientes de pessoal e equipamentos, seja para desdobrar a força no espaço, seja para fazê-la perdurar no tempo. Isso quer dizer que o estado da arte bélico compreende uma dimensão tecnológica e outra organizacional, que busca dar conta de questões de escopo (quais competências para combater, planejar e coordenar, quais variedades de equipamentos) e de escala (quais quantidades de pessoal e equipamentos). A

dimensão organizacional é central porque é a partir da solução adequada dessas questões de escopo e escala que se pode ter uma força capaz de combater usando armas combinadas.

Essa foi a questão que se pôs diante das duas superpotências da Guerra Fria, a União das Repúblicas Socialistas Soviéticas (URSS) e os Estados Unidos da América (EUA); como cada uma lidou com ela pode ser observado comparando os trajetos dos desenhos das suas respectivas forças motorizadas e de tanques. Com isso, pode-se apreciar o processo histórico de influências mútuas entre a promessa do estado da arte partilhado e escolhas políticas e restrições materiais de cada uma, e como isso veio a produzir uma dada organização das suas forças terrestres. Mas pode-se ir além, ajuizando os esforços efetivados nas últimas três décadas para se romper com o estado da arte no que se refere à sua dimensão organizacional, mais especificamente o tamanho ótimo da unidade combatente terrestre. Esse esforço pretendia (e pretende) ver a divisão, com 10 a 20 mil combatentes, substituída pela brigada, com 3 a 5 mil combatentes, sem perda da capacidade de combater com armas combinadas diante de tal redução.

Assim, este artigo busca contribuir, considerada a história do tempo presente, para um entendimento do processo de projeto de força como a conjunção de um determinado estado da arte bélico e da realidade logística socialmente situada em cada país, preenchendo lacunas que permitiriam melhor explicar os desenhos de forças terrestres, no rumo da agenda de pesquisa proposta por Glantz (2010, p. 29), para "apoiar, clarificar, desenvolver, criticar ... [o panorama do desenvolvimento contextualizado dos exércitos soviético e russo]".

Para tanto, apresentar-se-á de início a perspectiva metodológica das armas combinadas (Seção 4.2), para explicar seus principais conceitos e como eles podem ser articulados para que se compreendam os desafios do desenho de forças combatentes terrestres, sobretudo no que concerne às interrelações entre capacidades combatentes (escopo) e a disponibilidade de quantidades suficientes de pessoal e equipamentos para sustentá-las no espaço e no tempo (escala). Essa discussão termina identificando, no estado da arte, a centralidade da divisão como ponto ótimo de composição de tais relações. Em seguida, analisar-se-ão os desenhos das divisões pesadas da URSS e dos EUA, comparando-os em dois momentos: no final da Segunda Guerra Mundial (1945) (Seção 4.3) e no auge da Guerra Fria, na Frente Central da Europa (c. 1985) (Seção 4.4) o que permitirá observar que, a despeito de terem se orientado por diferentes decisões políticas e sido limitadas por diferentes restrições materiais e humanas, ambas as superpotências procuraram manter o enquadramento divisional como foco de seus projetos de força terrestre. Na Conclusão (Seção 4.5), após uma breve recapitulação em que são comparados os desenhos soviético e estadunidense, serão apresentados sinteticamente os

problemas enfrentados pela Rússia para reconfigurar suas forças terrestres de forma a retomar a divisão após um período em que teve de tentar fazê-lo em torno da brigada.

Com isso, se poderá demonstrar a continuidade da divisão como desenho organizacional prevalente em forças que buscam combater com armas combinadas. Mesmo assim, compreende-se como a brigada se apresentou como uma alternativa sedutora: ela basta para missões de contra-insurgência, de paz ou mesmo de ocupação de território. Todavia, os seus limites começam a ser revelados quando é preciso combater um oponente capaz de prosseguir na luta por muitos dias ou semanas.

E, no entanto, é em torno de brigadas que se propôs conceber e conduzir projetos de força terrestre nas últimas três décadas, o que talvez só tenha sido politicamente aceitável diante da falta de combates que pusessem tais forças realmente à prova. Assim, tem-se uma aplicação presente do conteúdo do artigo no sentido de avivar e consolidar o entendimento de que o auge do estado da arte, para poder combater com armas combinadas, continua sendo o enquadramento divisional, realidade que não se alterou nem mesmo diante da promessa tecnológica conferida por armamentos modernos e pela digitalização.

4.2 ARMAS COMBINADAS

Para compreender o desenho de forças terrestres no período da Guerra Fria é necessário adotar a perspectiva metodológica das armas combinadas aplicada ao projeto de força, ou seja, o desenho deliberado da composição de material e pessoal pelo qual se concebem e se preparam forças combatentes (DUPUY, 1990; EVANS, 2003; HOUSE, 2002; JORDAN et al., 2016).

Em sua expressão mais simples, dar conta de um projeto de força terrestre de forma bem-sucedida significa ter a força que se julga adequada quando necessário e ser capaz de sustentá-la em ação pelo tempo que se fizer necessário. Esse problema, enfrentado pela URSS e os EUA em diversos momentos, também se faz relevante para qualquer outra sociedade soberana: saber quais forças se pode ter e o que se pode fazer com as forças que se têm. A perspectiva das armas combinadas permite comparar diretamente diferentes projetos de força em função dos seus resultados combatentes, aproveitando o que se pode aprender com isso para propor redesenhos ou mudanças de conduta diante do que é dado pelo estado da arte bélico e das decisões políticas e restrições humanas e materiais (O'HANLON, 2009; TUCK, 2014).

Ela se baseia inicialmente no reconhecimento de que diferentes composições de pessoal, armamento e práticas levam a capacidades combatentes diferenciadas. Daí decorre que

o arranjo ótimo para enfrentar uma dada composição sempre envolverá uma disposição ótima de tropas capazes de realizar determinadas práticas no tempo e no espaço. Tropas que manejam armamentos ou sistemas de armamentos contra tropas oponentes são ditas armas combatentes: infantaria, que combate a pé (mesmo que se desloque ou use armamentos em veículos); cavalaria, que combate montada em veículos de qualquer tipo; e artilharia, que combate à distância. Tratam-se por extensão também como armas, mas armas de suporte ou de apoio, os vários tipos de tropas cujo papel não é o manejo de armamentos em combate, mas que facilitam ou multiplicam o agir das armas combatentes: sistemas de sensoriamento, de sinais (comunicação), de apoio ao movimento (engenharia) ou de preservação da capacidade de combater (suprimento, manutenção, medicina).

Existem dois principais desafios no desenho de forças combatentes terrestres. O primeiro diz respeito às competências das diferentes tropas, de armas distintas, que devem ser formadas e estar à disposição, e à variedade de armamentos e equipamentos necessários, ou seja, o problema de escopo das capacidades e dos equipamentos que se deseja ter na força. O segundo diz respeito ao dimensionamento das partes da força em termos do seu número, ou seja, o problema de escala suficiente para dispor da força no espaço e ao longo do tempo.

Em relação ao escopo, o foco da questão é realmente ter competência suficiente para obter as vantagens combatentes de armas combinadas: para se pôr no auge do estado da arte. Entretanto, existem formas alternativas de combater que também podem produzir vantagem, sobretudo se não se estiver enfrentando oponentes que fazem uso de armas combinadas.

Quando se considera o combate entre tropas da mesma arma, com capacidades combatentes análogas, a vantagem que se pode obter decorre de número, posição e do desempenho relativo de uma e da outra. Pode-se ter ainda tropas de uma arma combatendo tropas de outra arma, e aí busca-se vantagem não apenas no número, posição e desempenho relativo, mas principalmente nas assimetrias de capacidades combatentes. Nesses casos, trata-se de armas isoladas: cada tropa faz aquilo que é mais afeto às suas capacidades combatentes. Por exemplo, a infantaria enfrentando tanques procurará por emboscadas em que as vantagens de mobilidade, proteção e poder de fogo dos tanques sejam embaraçadas pelo uso do terreno e pela surpresa. Analogamente, tanques enfrentando infantaria buscam espaços de tiro e manobra de maneira a explorar a geometria relativa contra as posições e de forma a minimizar o uso do terreno pela infantaria.

Pode-se combater usando mais de um tipo de arma, empregando sucessivamente diferentes armas contra o oponente. Como cada arma exige um arranjo ótimo para que se possa utilizá-la com vantagem, o uso sucessivo de diferentes armas obriga o oponente a ter que

modificar seus arranjos para lidar ora com uma, ora com outra, impondo-lhe assim uma desvantagem. Nesse caso, trata-se de armas alternadas, em que se busca vantagem pela exploração das desvantagens que o oponente passa a ter em função do que tiver feito para lidar com a arma anterior e durante a passagem de um arranjo para outro. Por exemplo, a infantaria disposta para emboscar tanques está mal posicionada para enfrentar outra infantaria ou para lidar com artilharia; os tanques que tiveram que buscar posições de tiro e manobra para enfrentar a infantaria estão mal postos para lidar com outros tanques ou com artilharia, e assim por diante.

É possível também empregar associadamente diferentes armas contra o oponente. Quando se tem a posse de diferentes armas capazes de agir cooperativamente, é possível obrigar o oponente a adotar um arranjo que não seja ótimo para lidar com nenhuma delas isoladamente, mesmo que seja capaz de lidar com todas elas em alguma medida. Como resultado, o oponente luta em desvantagem. Neste caso, trata-se de armas apoiadas, em que se busca explorar as capacidades combatentes de armas diferentes para que o arranjo do oponente deixe a desejar. Por exemplo, a infantaria pode ser apoiada pela manobra ou poder de fogo dos tanques ao redor do seu posicionamento e contar com fogos de artilharia para enfraquecer o oponente com barragens preparatórias, ou embaraçar os movimentos do oponente enquanto estiver rearranjando suas forças.

Mas o auge do estado da arte é quando se tem diferentes armas capazes de agir de maneira tão concentrada no espaço e unificada no tempo que o oponente não tem como adotar um arranjo que possa dar conta desse conjunto. De fato, qualquer arranjo que adote para dar conta de uma das armas o exporá às vantagens das demais. Nesse caso, trata-se de armas combinadas, em que se busca maximizar as diferentes características de diferentes armas diante de qualquer que seja o arranjo do oponente. Em armas combinadas, a infantaria segue lado a lado com os tanques dispondo de uma artilharia que é capaz de responder a chamados diferenciados e específicos durante o próprio desenrolar do combate.

Reconhece-se a dificuldade de dispor e sustentar formaturas combatentes capazes de prover e fazer uso de armas combinadas de maneira fluente. Não é fácil nem simples ter tropas competentes tanto no que é relevante para as condutas combatentes da sua própria arma quanto para atuar em combinação com outras armas. Também não é fácil nem simples dispor dos recursos para desenvolver e produzir a variedade de equipamentos e armamentos necessários. Por isso, apesar de a meta mais ambiciosa no desenho das forças terrestres ser poder dispor de armas combinadas, admite-se que a falta de meios ou de pessoal suficientemente competente leve a não mais que a capacidade de combater usando armas apoiadas, armas alternadas ou

mesmo armas isoladas. Na guerra, é necessário lutar com as forças que se tem, não com as que se desejaria ter.

Dessa forma, atender ao primeiro desafio no desenho de forças terrestres – o de escopo – significa poder buscar o máximo de capacidade no rumo de armas combinadas. É a partir desta questão que se apresentam as preocupações mais incisivas de desempenho comparado em relação ao oponente. Isso inclui tanto o desempenho de pessoal, em termos de capacitação, motivação e competências, quanto o de equipamentos e armamentos.

Por sua vez, o desafio da escala é pertinente ao número de coisas e pessoas e ao fluxo de produção e distribuição de tudo que se precisa ter para poder dispor da força. Aqui, as questões mais incisivas são quanto a possibilidades de produção, estoque e reposição de materiais e seus fluxos logísticos; e de recrutamento, treinamento e cuidado com pessoal e a formação de seus efetivos. Números são relevantes no espaço e no tempo: no espaço, eles dizem respeito a ter material e pessoal suficiente para permitir a sustentação da capacidade combatente no terreno; no tempo, para sustentar a luta enquanto perdurar o agir dos oponentes. É isso que se ganha ao atendê-lo.

É partindo dessa perspectiva que se pode compreender a centralidade da divisão (entre 10 mil a 20 mil combatentes) para o desenho das forças terrestres de uma sociedade que ambicione combater com armas combinadas. Trata-se do ponto ótimo em termos de escopo e escala, se comparado com a brigada (de 3 mil a 5 mil combatentes) ou com o corpo-de-exército nos EUA ou o exército numerado na URSS (de 30 mil a 60 mil combatentes). A partir dela se podem entender todas as considerações materiais de armamentos, de pessoal e de comando. Tudo o mais existe ao seu redor para permitir, apoiar ou complementar sua ação.

Esse estado da arte é fruto das muitas combinações de diferentes alternativas de escala e escopo, muitas contraditórias entre si, havidas desde o Século XVIII, quando o problema das armas combinadas se pôs de maneira clara diante da necessidade de um desenho deliberado para as forças terrestres. Em síntese, esse desenho resulta da composição de um acervo de saberes partilhado, um determinado estado da arte bélico, e o contexto e a situação de uma dada sociedade (DELBRÜCK, 1990; HAYTHORNTHWAITE 1997; HOUSE, 2002; WILSON 1998; KEDZIOR, 2000).

Esse é o rumo da exposição do desenho das divisões ditas pesadas, motorizadas e com tanques, da URSS e dos EUA na Segunda Guerra Mundial (1939-1945 na Europa) e no auge da Guerra Fria (c. 1985). O tanque, veículo blindado motorizado, foi uma parte da solução em resposta ao impasse da guerra de trincheiras. Era, na origem, uma casamata móvel, que podia atravessar a terra de ninguém entre as trincheiras oponentes sendo imune aos disparos de fuzis

e metralhadoras e aos fragmentos de granadas de artilharia. Associado a táticas de infiltração da infantaria (ENGLISH; GUDMUNDSSON, 1994) e de articulação coordenada com a artilharia (BAILEY, 2003; GUDMUNDSSON, 1993), o tanque correspondeu ao cerne de um redesenho do que seriam e poderiam vir a ser as armas combinadas modernas (GUDMUNDSSON, 2004).

Os resultados observados em experimentos e as visões de um futuro marcado pela motorização e os tanques ao longo das décadas de 1920 e 1930 produziram diferentes propostas de como se preparar e conduzir uma forma de guerrear 'blindada'. Esta revelou-se capaz de dar imensa vantagem na campanha da França de 1940, onde as divisões blindadas alemãs (*Panzerdivisionen*) demonstrariam o potencial da chamada "guerra relâmpago" (*Blitzkrieg*), que perfurava as linhas oponentes para desconjuntar suas armas combinadas e, potencialmente, paralisava suprimentos, comando, cidades, indústrias, governos (BELLAMY, 2015; DEIGHTON, 2000; HOUSE, 2002).

Durante a Guerra Fria se observariam questões semelhantes com o desenvolvimento do helicóptero, a começar por entender como aproveitar essa melhora em desempenho técnico para produzir vantagem combatente. Embora helicópteros não tenham tido o mesmo significado que a motorização e os tanques, eles acrescentavam alternativas em termos de possibilidades de uso.

Helicópteros podiam ser configurados como veículo de reconhecimento e guia de fogos, como 'tanque', ou seja, artilharia móvel pelo ar, ou 'caminhão', para transporte de tropas e materiais (GUNSTON, 1999; MCGOWEN, 2005; MILLER, 2001). A sua velocidade de deslocamento lhes permitia estar em toda parte, cruzando a linha de contato entre as tropas para agir na retaguarda oponente. Helicópteros mudavam a geometria do enfrentamento e podiam interferir em seu desenrolar de novas maneiras. Podiam agir desde direções inesperadas, idealmente desde a retaguarda do oponente, atravessando qualquer terreno e ignorando todos os obstáculos. Podiam espreitar desde um ponto cego e caçar alvos discriminadamente, fosse guiando artilharia centralizada, atacando com mísseis ou canhões de elevada precisão ou pondo no terreno tropas ou materiais (BOYNE, 2011).

Esperava-se ainda que pudessem fazer um grande número de sortidas, dia ou noite, operando com fluência pela neblina e mesmo, com algumas cautelas, sob chuva ou neve. Diante dessas possibilidades, exigiram adaptações e ajustes em práticas e condutas, mas não chegaram a reconfigurar o estado da arte bélico a ponto de exigir novo enquadramento das armas combinadas ou deslocar o ótimo de escala e escopo da divisão para outro desenho (ALLEN, 1993).

De outra forma, em 1941, URSS e EUA se viram diante da realidade disruptiva decorrente da motorização e dos tanques, e foi a partir dela que passariam a considerar o desenho de suas próprias divisões pesadas.

4.3 AS DIVISÕES PESADAS DA URSS E DOS EUA EM 1945

4.3.1 **Os Corpos de Tanques e Mecanizado Soviéticos**

Em 22 de junho de 1941, o grande sonho da URSS de ter um exército no auge do estado da arte em desenho, armamentos e capacidades teve de ser abruptamente abandonado diante do furor da invasão nazista. As suas forças mais bem preparadas desde antes da guerra, ao redor de 4,2 milhões de combatentes, foram praticamente aniquiladas. Em lugar do sonho, sobraram o desespero diante da constatação de que era impossível dar conta do oponente e a determinação de lançar tudo o que tivessem contra a ameaça existencial que rasgava território soviético adentro e cuja sombra se projetava até Moscou.

A imensa reserva, talvez de 8 milhões de combatentes, foi imediatamente posta em campo. Embora tivesse de lutar com equipamentos mais antigos, a força ainda buscava se conformar aos desenhos e às condutas combatentes mais modernas. Mas as perdas colossais que seguiam sofrendo apontavam para uma derrocada completa. Em resposta, mais e mais tropas foram treinadas e lançadas à luta o mais rapidamente possível, mordendo fundo nos estoques de suprimentos e limitando em escopo as capacidades que podiam aprender. Tendo perdido a maior parte de seu território europeu, a URSS teve de produzir milagres para evacuar suas fábricas, reconstituí-las na Sibéria e conseguir mantê-las funcionando (GLANTZ 1991a, GLANTZ; HOUSE, 2015).

Os soviéticos só contiveram o invasor por uma largueza de espírito incomum e pelo abandono deliberado de qualquer ambição de sofisticação ou atualidade no desenho das suas forças. A sua solução em termos de desenho foi adotar o exército numerado, ao qual se subordinavam unidades combatentes largamente autônomas. Era um retorno a fundamentos. Cada unidade combatente passou a ter um armamento preponderante. A conduta do combate foi simplificada e a carência de pessoal qualificado tornava necessário subordinar muitos aos poucos efetivamente competentes para comandar. Embora as tropas fossem bem treinadas no manejo dos armamentos e estivessem verdadeiramente empenhadas na luta, não se tinha muito mais do que isso. Além disso, a autonomia das unidades combatentes não era gratuita: as limitações na estrutura de comando dos exércitos numerados obrigavam cada unidade a lutar por si (DUNNIGAN, 1977; GLANTZ, 2001).

Conscientemente, abandonou-se qualquer tentativa de armas combinadas (BELLAMY, 2008; GLANTZ; HOUSE, 2015; ELLIS, 1993). Cada unidade era de uma única arma que vinha enfrentar o oponente como arma isolada. Na defesa, escalonavam-se diferentes unidades até que desse certo, ou não. Havia mais êxito em três circunstâncias: ao defenderem posições fortificadas e camufladas do que em campo aberto; na lama ou neve do que em bom tempo; quando o oponente enfrentava dificuldades de reposição de suprimentos. No ataque, e se contra-atacou desde a primeira hora, o plano dado pelo comando do exército numerado tinha de ser seguido à risca: as unidades eram lançadas em sucessão cronometrada contra o oponente, precedidas, quando possível, de barragens de artilharia preparatórias, e ambicionavam combater como armas alternadas. Tais ataques geralmente davam errado, a não ser que o oponente estivesse combalido pelo inverno ou pela falta de suprimentos. E assim morriam muitos mais soviéticos do que invasores; mas morriam invasores em quantidades suficientes para diminuir sua capacidade ou vontade de lutar. Para os soviéticos, lutar demandou perseverar, contando com a imensidão do seu território, defendendo-se desesperadamente e atacando com abandono, enquanto aceleravam a mobilização de mais e mais forças para soterrar os invasores com números. Eles aceitavam a desvantagem relativa das armas isoladas ou alternadas porque só conseguiam lutar assim.

Em fins de 1942, restava claro que a URSS não seria sobrepujada; faltava saber com quanto sacrifício e esforço os invasores seriam expulsos. Para poder atacar com expectativa de sucesso a custos aceitáveis, reconheceu-se que era preciso buscar armas combinadas uma vez mais. Entretanto, isso significava ter de centralizar e complicar para se fazer capaz de articular e associar as diferentes armas sob escalões de comando próximos ao combate, permitindo assim aproveitar oportunidades e dar conta de dificuldades não previstas nos planos cronometrados dados pelo comando do exército numerado. Para tanto, em setembro de 1942, criaram-se dois tipos de organização de tamanho divisional, denominados corpos, num exagero de nomenclatura que não correspondia ao seu tamanho real (DUNNIGAN, 1977; GLANTZ, 2001; GLANTZ et al., 2004; GLANTZ; HOUSE, 2015).

O primeiro foi o Corpo de Tanques (FIGURA 4.1 Corpo de Tanques Soviético (1942-1945)), composto de três unidades chamadas brigadas de tanques que combinavam tanques médios e leves com infantaria armada com submetralhadoras; uma brigada de infantaria motorizada; um regimento de tanques pesados; e regimentos e batalhões de diferentes armamentos de artilharia e nominalmente de outras armas: engenharia, antitanque, reconhecimento, antiaérea e sinais. Foi possível ter mais de três dezenas de corpos de tanques com aproximadamente 12 mil combatentes, 2,4 mil de infantaria, 240 tanques e 150 peças de

artilharia e de lança-foguetes cada um (DUNNIGAN, 1977; ZALOGA; NESS, 1998). Em linhas gerais, era uma divisão blindada semelhante às de outros países, com duas grandes vantagens e duas grandes desvantagens em relação a elas.

FIGURA 4.1 Corpo de Tanques Soviético (1942-1945)
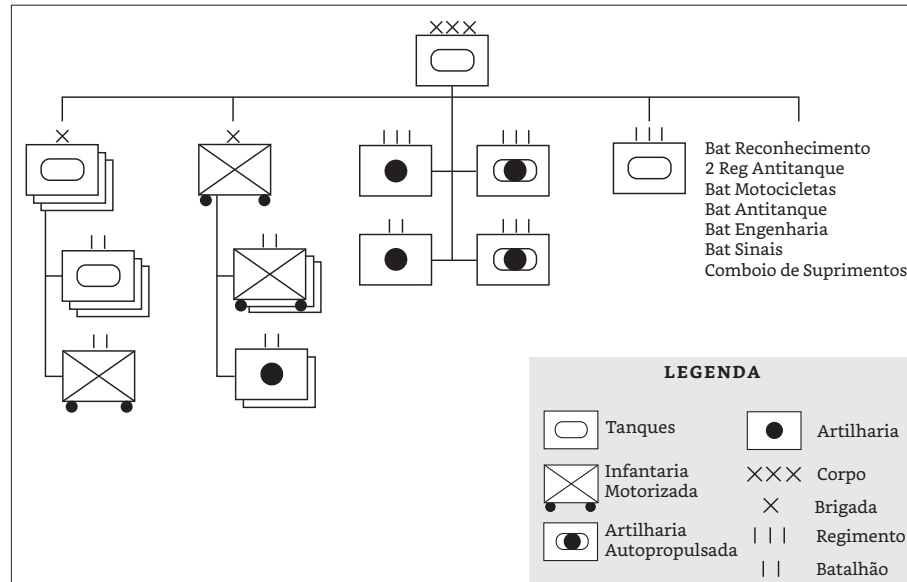
Fonte: Adaptado pelos autores a partir de Dunnigan, 1977, p. 120.

A primeira vantagem deste desenho organizacional era que os soviéticos dispunham de tanques suficientes para manter seus corpos de tanques completos e para combater com superioridade numérica de até 2:1 em comparação com a mais forte das divisões blindadas alemãs. Com isso, podiam contrapor sua vantagem numérica à superioridade de desempenho dos alemães, derramando contra o oponente uma enxurrada de tanques para além da capacidade antitanque de qualquer posição individual na linha de frente. Também podiam fazer o mesmo contra tropas alemãs que viessem a ser apanhadas na retaguarda depois de uma ruptura bem-sucedida.

A outra vantagem era que os soviéticos sabiam profundamente o quão vulneráveis eram os tanques oponentes sem apoio próximo da infantaria. Como seus caminhões não tinham capacidade fora-de-estrada, eles eram usados para conduzir tropas de reposição, enquanto combatentes de infantaria seguiam encarapitados nos próprios tanques. Isso acabou dando às forças soviéticas capacidade para atacar arranjos defensivos, rompê-los e se lançar além, confiantes de que não seriam barrados por emboscadas da infantaria oponente. Uma vez tomado o objetivo, ele poderia ser defendido pela brigada de infantaria motorizada que seguia com cada corpo de tanques.

A primeira desvantagem era a falta de pessoal qualificado em número suficiente. Embora o número de peças e guarnições fosse adequado, cada equipe de artilheiros era responsável por quatro conjuntos delas ou mais de uma só vez, o que restringia seu uso ao tiro contra alvos que podia enxergar por si. Dessa forma, não se tinha artilharia moderna, centralizada, acionada por rádio, mas sim peças usadas como armamentos pesados. Em lugar de armas combinadas, tinha-se, na melhor das hipóteses, armas apoiadas, ou aquilo que os soviéticos passariam a chamar de todas-as-armas. A segunda era que não havia suprimento motorizado capaz de manter o corpo de tanques continuamente abastecido depois que ele avançasse para além das linhas do oponente. Só se podia ter o suficiente para reposição de munição para até quatro dias de combate e até dois reabastecimentos de combustível para os tanques. Isso limitava o alcance das ofensivas bem-sucedidas dos corpos de tanques em função da ausência de estradas e do grau de dificuldade do terreno a algo entre 150km e 200km.

Essas desvantagens eram particularmente consequentes quando um corpo de tanques encontrava resistência respaldada por artilharia centralizada na retaguarda inimiga depois da ruptura. Diante disso, suas opções eram limitadas. Podia tentar irromper, o que era muito difícil e arriscado na ausência de uma barragem preparatória. Podia empenhar e consumir sua infantaria, o que sacrificava a possibilidade de defender o que viesse a ser tomado, deixava o corpo de tanques enfraquecido e o tornava presa fácil para o inevitável contra-ataque do oponente com armas combinadas. Podia tentar mudar radicalmente de direção para contornar a resistência, mas isso demandava um excedente normalmente inexistente de combustível e a fortuna de se ter uma estrada pela qual seguir. Ou podia recuar e esperar reforços de outras unidades, o que significava encerrar a ofensiva, sabendo que para retomá-la teria de começar novamente e se exigiria toda a elaboração de uma barragem preparatória e de pelo menos um corpo de tanques completo.

O segundo desenho era bem mais sofisticado e recuperava a ambição do pré-guerra: o Corpo Mecanizado (FIGURA 4.2 Corpo Mecanizado Soviético (1942-1945)). Este foi o maior desenho de unidade praticado pelos soviéticos na Segunda Guerra Mundial, com três brigadas de infantaria motorizada, uma brigada de tanques, mais regimentos e batalhões de artilharia e de outras armas: engenharia, antitanque, antiaérea, sinais. Tinha aproximadamente 17,5 mil combatentes, 7 mil de infantaria, 120 tanques (os mais avançados disponíveis) e 120 peças (idem) cada (DUNNIGAN, 1977; ZALOGA; NESS, 1998). Nunca foi possível ter mais do que uma dúzia dos corpos mecanizados por carência de pessoal especializado. Partilhavam das vantagens e desvantagens de corpos de tanques com algumas diferenças importantes.

FIGURA 4.2 Corpo Mecanizado Soviético (1942-1945)

Bat Reconhecimento
Reg Antitanque
Bat Motocicletas
Bat Antitanque
Bat Engenharia
Bat Sinais
Comboio de Suprimentos

LEGENDA

⬭	Tanques	●	Artilharia
⊠	Infantaria Motorizada	×××	Corpo
⬭●	Artilharia Autopropulsada	×	Brigada
⊠	Infantaria Mecanizada	‖‖	Regimento
		‖	Batalhão
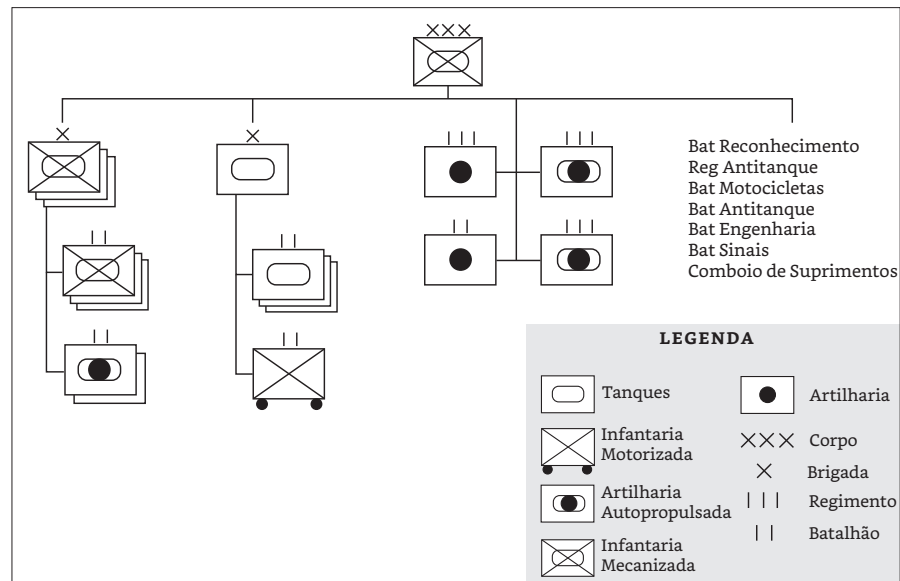
Fonte: Adaptado pelos autores a partir de Dunnigan, 1977, p. 121.

Os soviéticos dispunham de tanques suficientes para manter seus corpos mecanizados atualizados e completos. Além disso, eles também dispunham de caminhões fora-de-estrada e meias-lagartas (estas em número insuficiente) para conduzir a infantaria. Quase todos os veículos dos corpos mecanizados haviam sido fabricados nos EUA e apresentavam vantagens relativas de confiabilidade, economia de combustível e alternativas de uso se comparados aos veículos dos corpos de tanques (ELLIS, 1993). Enquanto a infantaria no corpo de tanques se mantinha próxima por meio de um expediente (encarapitar-se nos tanques), nos corpos mecanizados ela podia progredir no mesmo passo e ritmo todo-terreno dos tanques em seus meias-lagartas e nos melhores modelos de caminhões fora-de-estrada fabricados nos EUA. Isso viabilizava diversas possibilidades combatentes de armas apoiadas de infantaria, tanques e artilharia como armamento pesado. Isso também viabilizava a proximidade entre as unidades e, portanto, o uso mais eficaz de reconhecimento, antitanque, antiaérea, engenharia e especialmente, sinais – um corpo mecanizado completo era a única unidade soviética que dispunha de um número suficiente de rádios.

Mas ainda assim não se tinha artilharia centralizada. Nem mesmo os corpos mecanizados puderam contar com artilheiros suficientes. De forma comparável ao corpo de tanques, havia um número adequado das melhores peças, mas não se podia usá-las como armas combinadas. Só se podiam ter, diante da falta de pessoal qualificado, armas apoiadas, ou novamente todas-as-armas. Embora também sofressem com a falta de suprimento motorizado do corpo de tanques, os corpos mecanizados demandavam menos combustível, porque meias-

lagartas e caminhões consomem uma fração do consumo de tanques para cobrir a mesma distância. Além disso, uma mesma quantidade de munição rende mais quando usada por um efetivo maior de infantaria. Essas vantagens relativas permitiam que o corpo mecanizado não dependesse tanto de reabastecimentos para continuar lutando na defesa do que tomasse. Agora, uma ofensiva bem-sucedida podia ir mais longe (250km a 300km) e não dependia tanto de uma estrada pela qual seguir.

Corpos mecanizados podiam lidar com oponentes respaldados por artilharia centralizada porque as suas capacidades todo-terreno permitiam alternativas de armas apoiadas, o melhor do todas-as-armas soviético. Podiam infiltrar-se, penetrar ou contornar posições das maneiras que só a infantaria e a engenharia permitem, com apoio de armamento pesado e tanques. Podiam obter uma brecha ou aceitar combate móvel contra forças blindadas oponentes com infantaria, artilharia e até antitanque apoiando os tanques. Podiam dar conta de posições oponentes na retaguarda e ainda dispor de infantaria suficiente para defender o que ocupassem mesmo depois de ter lidado com elas. Todavia, os soviéticos entenderam que a verdadeira vocação do corpo mecanizado era a exploração da ruptura para assenhorar-se de uma posição vital, usualmente um nó ferroviário.

Com infantaria mecanizada todo-terreno, tanques e armamentos pesados, corpos mecanizados podiam enfrentar o que fosse enviado para retomar o que haviam conquistado com todas-as-armas. Entretanto, por mais que representassem um avanço em comparação com os corpos de tanques, os soviéticos estavam cientes de que não teriam suprimento motorizado adequado durante a guerra e que as suas limitações de pessoal provavelmente significavam que não se poderia ir além do todas-as-armas. As suas restrições de escopo eram de fato consequentes.

E com isso se chegou a Berlim.

Em 9 de agosto de 1945, a URSS invadiu a Manchúria japonesa numa demonstração da sua capacidade para lançar operações em larga escala na linha do que havia sonhado no pré-guerra. Foram empregados 1,5 milhão de combatentes, 5,5 mil tanques e quase 30 mil peças de artilharia contra o Exército do Kwantung, o mais poderoso e melhor equipado entre todos os exércitos japoneses. Este contava com 700 mil combatentes, 1,2 mil tanques e 5,4 mil peças de artilharia. Como parte da preparação para a operação, o 6º Exército de Tanques de Guardas foi reestruturado (e todos os corpos de tanques e mecanizados que o compunham), já considerando que se estava diante do modelo de desenho das forças no pós-guerra. Foram incorporados tanques, infantaria e peças, número e capacidades, para permitir o todas-as-armas em todas as brigadas (GLANTZ, 2003).

Com maior abundância de material, pessoal e tempo de preparo, foi possível incrementar o uso de artilharia, mas não a ponto de permitir armas combinadas. Mesmo assim, melhorou-se o que era possível melhorar e pôde-se ter um comboio de suprimento pensado para permitir um avanço de mil quilômetros, distância duas vezes e meia maior que a de qualquer ofensiva anterior, e 200 km superior à localização do objetivo. O resultado foi acachapante: em menos de duas semanas, a logística do Exército do Kwantung tinha sido destruída e o colapso japonês foi completo.

Iniciou-se de pronto um processo de ajuste ao redor do desenho bem-sucedido da Manchúria. A capacidade desse arranjo consubstanciava a materialização da superioridade soviética para projetar força em qualquer direção ao alcance das suas bases, por exemplo, a costa atlântica da França desde a Alemanha Oriental.

Entretanto, o todas-as-armas dependia da concentração articulada da força, em grandes quantidades. E aí houve a bomba atômica... para os soviéticos, uma verdadeira revolução nos assuntos militares, porque concentrar passaria a significar se tornar um alvo fácil e vulnerável. Toda essa aparente superioridade, agora convencional, parecia ter se esvaído. Foi diante dessa perspectiva, e de tudo que ela parecia demandar em termos de mudança do entendimento construído até então, que os soviéticos viriam a pensar no desenho de suas divisões para a Guerra Fria (GLANTZ, 2010).

4.3.2 **A Divisão Blindada dos EUA**

Até 8 de dezembro de 1941, os EUA haviam acumulado vinte anos de reflexão sobre a modernização do seu projeto de força terrestre. Ela se orientava por uma meta tida como amplamente hipotética de transformar, em escala e escopo, um exército com menos de 130 mil efetivos, movido principalmente a cavalo e organizado em cinco divisões dispersas em regimentos numa instituição capaz de pôr em campo 10 milhões de efetivos, centenas de divisões motorizadas e combater com armas combinadas. Mas a participação dos EUA na Segunda Guerra Mundial não se limitava a combater as forças do Eixo em conjunto com a Grã-Bretanha e a União Soviética. Os estadunidenses também se fizeram responsáveis por armar e suprir o esforço de guerra dos países aliados e abastecer suas populações civis, o que demandaria escopo, abrangendo capacidades combatentes e não combatentes e escala em absolutamente tudo.

Que tivessem conseguido superar a meta originalmente hipotética em número e capacidade combatente e dar conta das suas incumbências adicionais, também se deveu à

largueza de espírito, de empenho e sacrifício. Sobretudo desde o ataque a Pearl Harbor, quando se consolidaram a mobilização de toda a nação em torno do esforço de guerra e o engajamento direto de seus cidadãos nele, fosse se alistando nas forças, fosse trabalhando na indústria. Também ajudou que as pessoas responsáveis pelo planejamento de como combater, suprir e abastecer numa escala jamais vista pudessem contar com a experiência acumulada na tropa desde a Primeira Guerra Mundial e fora das forças no processo acelerado de industrialização dos Estados Unidos durante o mesmo período. Essa experiência ensinava que se podia sonhar sim, mas apenas com aquilo cuja viabilidade e utilidade se pudessem testar, e desde que viesse a estar disponível a tempo de contribuir com o esforço de guerra.

Para que pudessem modernizar o seu projeto de força terrestre, os EUA sabiam que teriam de priorizar, em termos de escopo, o desenvolvimento das capacidades organizacionais necessárias para viabilizar o suprimento continuado das suas forças independentemente da distância entre os teatros operacionais em que atuariam e a sua base industrial. Havia duas realidades inalteráveis: a primeira, os EUA eram separados da Europa por um oceano; a segunda, a infraestrutura logística no teatro europeu era insuficiente, na melhor das hipóteses, e inexistente, na pior, e não seria possível substituí-la em tempo hábil, antes que a guerra terminasse. Dessa forma, havia limites reais ao que se podia transportar em termos de escopo, considerada a demanda de coordenação e controle de múltiplas interfaces logísticas, e de escala, consideradas as demandas simultâneas e concorrentes das suas próprias forças, das forças aliadas e das suas populações civis na mesma cadeia de suprimentos (COAKLEY; LEIGHTON, 1968; GREENFIELD; PALMER; WILEY, 1987; GROPMAN, 1997; LEIGHTON; COAKLEY, 1955).

Por conta disso, os EUA consideravam a questão da confiabilidade dos armamentos como um empecilho significativo para que pudessem fazer uso amplo da motorização e dos tanques. Não adiantava ter os modelos mais avançados de veículos combatentes se eles não podiam ser mantidos continuamente em condições operacionais. Eles tinham de se manter funcionando sem o consumo constante de peças de reposição ou de tempo e empenho exagerados das equipes de manutenção. Cientes das implicações organizacionais de orientar suas escolhas em função da confiabilidade de seus armamentos e equipamentos, os EUA construíram instâncias de consulta e governança civil-militares para facilitar a troca de informações entre os dois grupos e desenvolveram sistemas robustos de teste e avaliação de armamentos (COAKLEY; LEIGHTON, 1968). Além disso, os estadunidenses puseram em campo o arranjo de controle de estoques mais avançado do mundo. Com ele, podiam saber exatamente o que tinham, onde estava e como transportá-lo de forma eficaz. Isso permitiu

manter as suas forças supridas diante de condições extraordinárias, enquanto eram forçados a reconhecer, mesmo assim, que a falta de escala na sua cadeia logística impediu que recebessem, em tempo hábil, todos os suprimentos que poderiam ter vindo a receber (OHL, 2020).

Entretanto, o principal desafio dos EUA na reformulação das suas divisões pesadas foi mesmo corporativo. Internamente não havia consenso sobre como fazer uso dos tanques, e cada arma buscou defender uma solução que desse conta de seus próprios interesses. A cavalaria desejava seguir exatamente como antes, trocando cavalos por carros blindados e tanques leves para reconhecer e fustigar o oponente em linhas de patrulha, e por tanques leves e mesmo médios para explorar a ruptura e perseguir o oponente em retirada até seus centros de comando e controle. Diante disso, a infantaria queria seus próprios tanques, não só para vencer as casamatas oponentes, mas também para caçar tanques, já que a cavalaria não parecia particularmente preocupada com os tanques oponentes mesmo sabendo do que eram capazes de fazer. Ao fim, a arma blindada (armor) acabou por substituir a de cavalaria. Ela tinha a ambição de ser a arma de armas combinadas modernas, incluindo tanques, infantaria e artilharia, além de engenharia, antiaérea, antitanque, sinais e logística. Seu papel seria irromper pelas linhas oponentes e explorar a ruptura (GILLIE, 1947; GREENFIELD; PALMER; WILEY, 1987; HAWKINS, 2013; HAWKINS; CARAFINO, 1997; KEDZIOR, 2000).

Em 1942, fez-se uma primeira tentativa de desenho da divisão pesada. Sabia-se que a maioria das tropas nas divisões de infantaria nunca seria motorizada, não porque faltassem bons caminhões, mas porque seria logisticamente impossível abastecê-los: não havia nem espaço de transporte suficiente para caminhões e suas peças de reposição, principalmente pneus, nem lugar para estocar todo o seu combustível na Grã-Bretanha (COAKLEY; LEIGHTON, 1968; LEIGHTON; COAKLEY, 1955). Quis-se uma divisão blindada capaz de realizar todas as tarefas imaginadas pela cavalaria, pela infantaria e pelos proponentes da guerra blindada. Ela veio a contar aproximadamente com 15 mil combatentes no total, dos quais 1,5 mil de infantaria, 700 meias-lagartas, 390 tanques, 48 peças de artilharia e 40 carros blindados (ZALOGA, 2006). O número particularmente baixo de combatentes de infantaria demonstrava que os EUA, como diversos outros países, também haviam subestimado quantos deles se faziam necessários para se poder lutar com armas combinadas.

A disfuncionalidade dessa estrutura divisional se revelaria no Norte da África em 1942 e na Itália em 1943.

Primeiramente, durante o combate, a divisão tendia a se rearranjar em brigadas com comando fragmentado, que disputavam a mesma artilharia e sofriam conjuntamente da falta de infantaria para guarnecer os tanques (ZALOGA, 2006). Em segundo lugar, havia mal-

entendidos táticos diversos, desde não saber aproveitar a superioridade de fogo que a infantaria mecanizada podia conferir, passando por esquecer que os tanques não eram cavalaria, e que por isso não deveriam seguir condutas combatentes antigas; a até não saber fazer uso da artilharia centralizada, por exemplo. Finalmente, havia problemas de desenho, de organização e suprimento (ATKINSON, 2002; ZALOGA, 2006). Em suma, dispunha-se até de armas combinadas, mas as condutas ainda estavam muito distantes do auge do estado da arte.

Diante disso, os estadunidenses também tiveram de recorrer a fundamentos. A sua experiência combatente na Primeira Guerra Mundial havia-se dado diante de restrições de escala e escopo significativas. Por falta de produção e de capacidade combatente, tiveram de contar com armamentos e seguir os arranjos de seus aliados. Isso formou uma geração de veteranos, base do oficialato e do generalato responsáveis pelo preparo e pela conduta na Segunda Guerra Mundial, muito ciosa da relevância de duas questões: saber preparar o esforço de guerra e saber projetar desenhos organizacionais como parte fundamental de um projeto de força terrestre.

Esse entendimento levou a um aprimoramento na capacidade estadunidense de diagnosticar e atender carências de equipamento e de organização que foi posta em prática ainda na Primeira Guerra e que não foi esquecida nos anos seguintes. Diante da necessidade de desenvolver novas condutas combatentes e de capacitar as tropas adequadamente, produziram-se milhares de materiais, inclusive as centenas de filmes de instrução, informação, conformação e mobilização, destinados desde aos combatentes na linha de frente, passando por toda a retaguarda militar, fabril, agricultural, até aos cidadãos nos cinemas dos EUA.

Em 1943, chegou-se ao desenho da Divisão Blindada (FIGURA 4.3 Divisão Blindada estadunidense (1943-1945)), guiado pelo desejo de explorar ao máximo a sua mobilidade todo-terreno e emulando a lógica das divisões blindadas alemãs e britânicas, que vinham diminuindo em tamanho. Uma divisão grande demais em movimento punha partes para além do alcance fácil do rádio, fazendo com que perdessem a capacidade de acionar a artilharia centralizada. Era, de fato, uma divisão blindada modesta, com dois comandos de combate, que podiam compor os seus três batalhões de infantaria em meias-lagartas e três batalhões de tanques com antitanque, antiaéreo e artilharia conforme a necessidade. Cada divisão contava ainda com um batalhão de reconhecimento, outro de engenharia blindada e uma generosa dotação de armas de apoio: sinais, antiaérea, apoio médico e transporte. Somava 10,5 mil combatentes, 500 meias-lagartas e 3 mil combatentes de infantaria, 250 tanques, 72 peças de artilharia e 54 carros blindados. Além disso, tinha em seus caminhões todo-terreno a capacidade de contar com um comboio de suprimentos pensado para 500km mesmo durante a batalha, capaz de prover quatro

cargas de combustível para cada veículo e oito dias de munição. Esse comboio se revelou redundante diante da capacidade do suprimento motorizado estadunidense, cuja audácia e flexibilidade lhe permitia seguir ruptura adentro como se fizesse parte das forças combatentes (ZALOGA, 2004).

FIGURA 4.3 Divisão Blindada estadunidense (1943-1945)
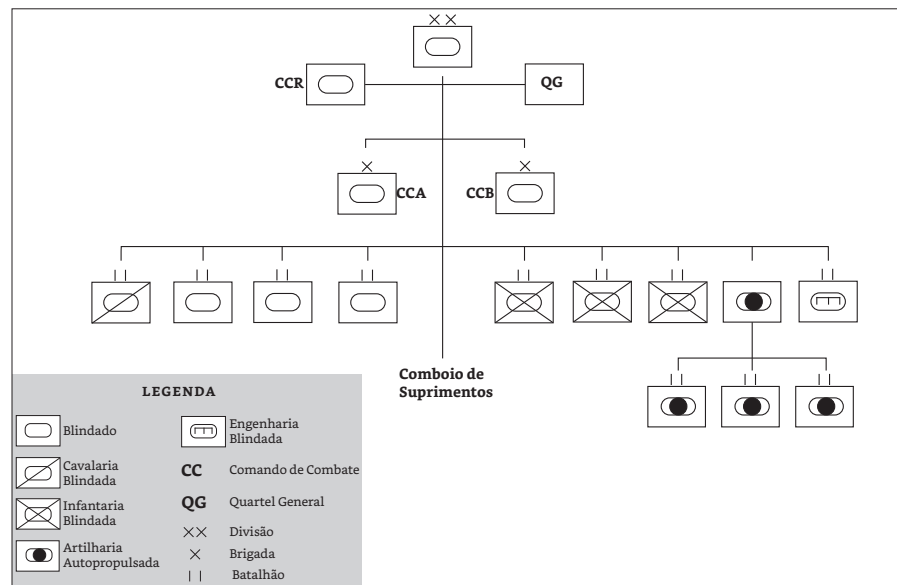
Fonte: Adaptado pelos autores a partir de Zaloga, 2004, p. 13.

A ênfase – que já se podia medir em décadas – nos problemas de escopo em termos da formação das capacidades organizacionais necessárias para preparar, suprir, coordenar e comandar as forças de combate, e para treiná-las nas condutas combatentes, insistentemente produziu uma dinâmica adaptativa nas forças dos EUA inimitável por qualquer outro país, que viria a potencializar o que se podia fazer com armas combinadas e alargar o estado da arte (STEWART, 2010; WILSON, 1998; ZALOGA 2004, 2006). Cada divisão blindada desdobrava com fluência seus batalhões em comandos de combate pensados para a batalha nas mais diferentes maneiras. Havia uma abundância de conhecimento partilhado e disponível que viabilizava um processo de educação continuada a todos que precisassem aprender. Com isso, a capacidade de lutar lado a lado se potencializava diante das recombinações de combatentes e armamentos. E ainda se tinha o 'ás na manga': cada divisão era capaz de mobilizar uma forte força-tarefa a partir do que tinha de melhor em equipamento, armamentos e pessoal, em suma armas combinadas, que podia ser posto diretamente sob o comando do QG da divisão.

Entre o desembarque na Normandia, em 6 de junho de 1944, e o Dia da Vitória na Europa, em 8 de maio de 1945, as forças blindadas seguiram no mesmo ritmo de aprendizado

e adaptação que tinham demonstrado na África e na Itália. Tinham prioridade de pessoal, recursos e conexão com a retaguarda industrial e a boa-vontade do serviço de suprimentos, tinham seus especialistas em mecânica e combate. As inovações técnicas e de conduta se difundiam pelas unidades quase tão rapidamente quanto surgiam (JARYMOWYCZ, 2008; ROTTMAN, 2007; 2008; 2011; ZALOGA, 2011). As touceiras da Normandia eram intransponíveis para tanques; inventou-se o rhino, lâminas que permitiam vencê-las, em menos de um mês desde a chegada, e seu uso se disseminou para as demais unidades em não mais que duas semanas. Praticou-se, nos primeiros dois meses de luta, contra as forças alemãs densas e fortemente blindadas, tudo o que se podia pensar em termos de armas combinadas, integrando artilharia e apoio da aviação, com seus comandos articulando batalhões contra o melhor do oponente para produzir efeitos desconcertantes, como só divisões capazes de todo-terreno com um suprimento motorizado (e aéreo) eram capazes de fazer.

Rompida a frente e na corrida desde a França até a Alemanha entre julho e novembro de 1944, contra as retaguardas e folgas de um oponente em retirada, reinventaram-se as armas combinadas mais uma vez. As vanguardas seguiam como armas combinadas sob a cobertura de aeronaves que se alternavam em ponto de táxi enquanto houvesse luz do dia. Quando os alemães desfecharam a contraofensiva nas Ardenas, em dezembro de 1944, descobriu-se que as divisões blindadas estadunidenses eram capazes do feito logístico e combatente de se reorientarem drasticamente em dias, e não nas semanas previstas nos manuais. Mas foi na luta nas cidades e contra as fortificações na própria Alemanha que se teve o auge das armas combinadas nas forças dos EUA. Aprendeu-se a isolar o oponente de seus suprimentos com fogos, a alavancar o ataque com uma súbita bordoada de impacto simultâneo, a participar com artilharia centralizada em armas combinadas na luta de casa em casa, de ponto forte em ponto forte, travando dezenas de combates em cada sortida. O que teria sido um obstáculo de semanas – como Berlim para os soviéticos – foi atravessado em dias.

Em suma, a partir de 1944, tudo o que se descobriu e aprendeu viria a produzir uma artilharia cada vez mais integrada, em que todas as peças ao alcance de um alvo podiam ser mobilizadas contra ele, independentemente da unidade à qual estivessem associadas. Podia-se responder ao chamado de uma tropa inicialmente com qualquer peça ao alcance, e depois vindo a somar mais e mais peças. Também era possível sincronizar os disparos de uma grande quantidade de peças fazendo com que atingissem o alvo simultaneamente para máximo impacto, com efeitos devastadores (BAILEY, 2003; EDGERTON 2011; GUDMUNDSSON, 1993).

Chegado o final da Segunda Guerra Mundial com a rendição japonesa, e diante da perspectiva de uso da bomba atômica no campo de batalha, o exército dos EUA se pôs a pensar sobre a questão como fazia habitualmente: perguntando-se qual seria o melhor desenho divisional para poder lidar com isso.

4.4 A FRENTE CENTRAL, C. 1985

4.4.1 As Divisões de Rifles Motorizados e de Tanques da URSS

A URSS terminou a Segunda Guerra Mundial com um imenso arsenal à sua disposição. Entretanto, a sua preocupação com o significado tático da possibilidade de emprego de armamentos nucleares durante a batalha levou a um intenso esforço de reequipamento durante a década de 1950, que ambicionava produzir veículos todo-terreno suficientemente blindados para resistir ao ambiente radioativo e em número suficiente para transportar toda a tropa. A isso se seguiu a postura de assertividade nos anos Brejnev, a partir de meados dos 1960 e até os 1970, quando se observou um crescimento substancial nas suas forças armadas, especialmente nas fronteiras com a OTAN, mesmo diante do declínio demográfico e da estagnação econômica que viriam a se acentuar no final desse período.

O que se plantara nos 1950 viria a dar bons frutos, ao menos inicialmente. A mecanização massiva do exército soviético para lidar com a radioatividade e o aumento contínuo no número de efetivos conferiram uma margem de superioridade às forças da URSS em comparação com às da OTAN. Como essas mudanças se deram diante da escolha deliberada por se manter o desenho organizacional herdado da Segunda Guerra Mundial, foi possível seguir de forma constante no processo de expansão das suas forças em termos de pessoal e equipamentos até que se vissem limitados por restrições demográficas e industriais (COCKBURN, 1983; GLANTZ, 2010; HOUSE, 2020).

As melhoras em armamentos e equipamentos entre 1945 e 1985 ampliaram o que se podia fazer com eles, mas não foram suficientes para reconfigurar as características de cada arma. Nem mesmo a incorporação de helicópteros e antiaérea de helicópteros levou a uma mudança no desenho organizacional das forças terrestres soviéticas. O seu foco era e continuava sendo se fazer capaz de lutar com armas combinadas, integrando infantaria, tanques, armamento pesado, peças de artilharia e antitanque, e agora, helicópteros. Dessa forma, os soviéticos apenas refinariam em detalhes os desenhos da Divisão de Tanques e da Divisão de Rifles Motorizados que haviam produzido a vitória na Manchúria em 1945 (ERICKSON, HANSEN; SCHNEIDER, 2019; GLANTZ, 2010; US ARMY, 1984; 1991).

Por volta de 1985, as forças de primeira linha da URSS tinham divisões e exércitos numerados com artilharia centralizada em cada divisão. O seu suprimento motorizado era capaz de apoiar o exército numerado em penetrações profundas no território europeu. Agora que tinham uma coisa e outra era possível voltar a ambicionar ter armas combinadas nas divisões. Com isso, as Divisões de Rifles Motorizados assumiram o papel combatente principal. Sua destinação era lutar, fosse para defender, fosse para atacar e produzir a ruptura da linha oponente. As Divisões de Tanques passaram a ser os instrumentos de exploração da ruptura, penetrando para além das linhas oponentes (COCKBURN, 1983; ISBY, 1988; ERICKSON; HANSEN; SCHNEIDER, 2019; US ARMY, 1991).

A Divisão de Rifles Motorizados (FIGURA 4.4 Divisão de Rifles Motorizados soviética de primeira linha (c. 1985)) correspondia a 150 das 210 divisões que comporiam o Exército Soviético, com efetivo de 13,5 mil combatentes, 4 mil combatentes de infantaria, 270 tanques, 150 peças e lança-foguetes, 130 mísseis antitanque e 20 helicópteros cada uma (ISBY, 1988; US ARMY, 1991; VVAA, 2011).

FIGURA 4.4 Divisão de Rifles Motorizados soviética de primeira linha (c. 1985)
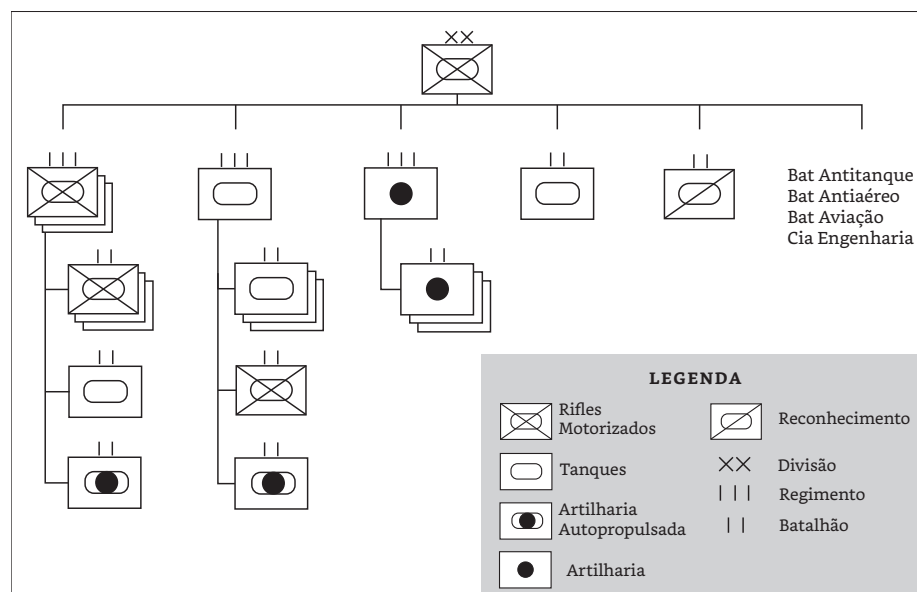
Fonte: Adaptado pelos autores de US Army 1991, p. 4-37.

A Divisão de Tanques (FIGURA 4.5 Divisão de Tanques soviética de primeira linha (c. 1985)) correspondia a 52 das 210 divisões que comporiam o Exército Soviético, com efetivo de 11 mil combatentes, 1,4 mil combatentes de infantaria, 450 tanques, 150 peças e lança-foguetes, 130 mísseis antitanque e 12 helicópteros cada uma (ISBY, 1988; US ARMY, 1991; VVAA, 2011).
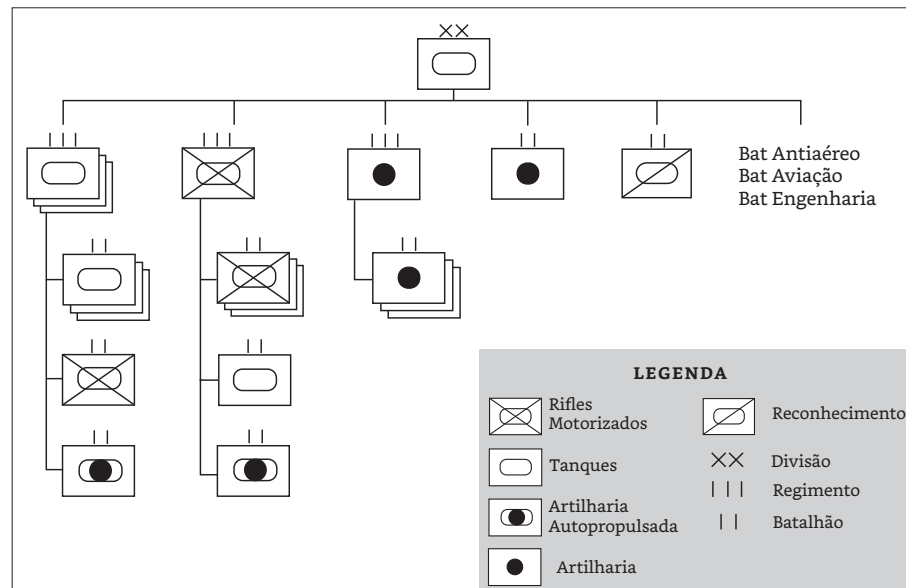
FIGURA 4.5 Divisão de Tanques soviética de primeira linha (c. 1985)

Fonte: Adaptado pelos autores a partir de US Army, 1991, p. 4-112.

O refino nos detalhes do desenho organizacional das divisões se deu reproduzindo a mesma proporção de armas sucessivamente desde as menores até as maiores unidades. Era literalmente um exercício de 'mais do mesmo'.

A começar pela companhia de rifles motorizados, com três pelotões de infantaria (100 combatentes em 10 veículos blindados) e um pelotão de tanques (4 tanques). Tinha-se o batalhão e o regimento acrescentando a este último 3 + 1 inicial diverso, 1 adicional de diferentes artilharias, e frações de 1, (designadas pelas reticências "..."), de especialidades como reconhecimento, antitanque, antiaérea e engenharia, entre outras. O batalhão tinha (3+1+1+…) companhias; o regimento tinha (3+1+1+…) batalhões. A companhia e o batalhão de tanques eram compostos apenas de tanques, mas a partir do regimento, as unidades de tanques espelhavam a mesma proporção reunindo 3 de tanques, 1 de rifles motorizados e 1 de artilharia com acréscimos (+…).

Na divisão havia o mesmo (3+1+1 regimentos +…). Havia um batalhão de tanques reforçado na divisão de rifles motorizados e um batalhão de artilharia lança-foguetes pesados na divisão de tanques. Seguia-se assim em cada exército numerado (3+1 divisões de infantaria e de tanques – nos de primeira linha, +1 divisão de artilharia – +...) e até a totalidade do Exército Soviético, com 150 divisões de rifles motorizados e 52 divisões de tanques, um número substancial de divisões de artilharia, além de batalhões, brigadas e "corpos" independentes (+...).

Assim organizadas, era de se esperar que a manobra e o combate fossem levados adiante pelos regimentos em escalões constituídos para que pudessem efetivamente ter e lutar com armas combinadas, pelo menos nas melhores divisões de primeira linha. Com isso, evitava-se a fragmentação das forças em unidades com escopo e escala inferiores aos necessários para fazê-lo. Entretanto, admitia-se o uso autônomo de certas unidades diante da ruptura, além de expedientes como passar a usar as peças de artilharia isoladamente para o tiro direto, como armamentos pesados, sobretudo para alcances curtos. De fato, havia diversas situações em que fazia mais sentido reverter ao todas-as-armas, abrindo mão de parte da artilharia centralizada, fosse diante da necessidade de responder mais rapidamente do que era possível ou prudente diante dos limites nos sistemas de comunicação e na capacidade dos artilheiros, fosse quando se mostrasse conveniente mover a artilharia mais pesada para que pudesse atirar diretamente contra alvos mais difíceis ou resistentes.

O mesmo se aplicava às demais armas, que também teriam de continuar sendo capazes de apoiar o todas-as-armas quando não fosse possível ou expediente ter armas combinadas. Isso tornava o comando de um regimento, especialmente de rifles motorizados, particularmente desafiador: era preciso compor e recombinar oito armas e dezenas de armamentos em uma variedade considerável de modos de uso (COCKBURN, 1983; GLANTZ, 1991a; GLANTZ, 1991b; US ARMY, 1984).

As divisões soviéticas eram menores do que as da OTAN, e atuavam de forma mais concentrada e rígida. Era esperado que a sua retaguarda, e mesmo seus flancos, fossem protegidos pelo exército numerado ao qual estava integrada. Mesmo assim, sabia-se que as divisões seriam consumidas, provavelmente de forma expressiva, assim que entrassem em combate. Por isso seus desenho e treinamento enfatizariam manter seu foco numa única missão específica para lidar com a fragmentação no combate e baixas significativas (COCKBURN, 1983; GLANTZ, 1991a; GLANTZ, 1991b; US ARMY, 1984;). Essa rigidez em desenho e conduta se explicava por dois motivos distintos: o tático, dado pela necessidade de escolher o melhor desenho organizacional diante das capacidades do oponente, e o logístico, dado por restrições demográficas e industriais da sociedade soviética que afetariam sua capacidade de atender, em escopo e escala, às demandas por pessoal, armamentos e equipamentos das suas forças.

Havia uma excelente razão para se preocupar com o oponente. A capacidade de artilharia integrada da OTAN, e dos EUA, em particular, era avassaladora. Uma vez que soubesse de um alvo, fosse pelo relance fugidio de um helicóptero de reconhecimento, a projeção do ponto de origem do disparo de uma peça ou mesmo algo tão inusitado como um

telefonema recebido de um cidadão alemão mais atento, era esperado que ele fosse prontamente despedaçado pela munição mais apropriada. Na prática, não havia defesa o fogo da artilharia, salvo se ela errasse o disparo ou o alvo se evadisse em tempo da posição na qual atirara (BAILEY, 2003; GUDMUNDSSON, 1993).

Portanto, era simplesmente razoável adotar uma formação compacta que permitisse aos soviéticos se moverem com a maior celeridade e discrição possíveis e contarem com alguma proteção na esteira de uma barragem que lhes abrisse o caminho e reprimisse ao menos uma parte da artilharia da OTAN. Para que pudessem alcançar o oponente em condições de combate, parecia mesmo necessário partir em marcha acelerada por algum caminho imprevisto, em silêncio de rádio (e, portanto, sem contar com artilharia centralizada), até que atravessassem a zona de segurança entre seu ponto de partida e o de contato com o oponente (BAXTER, 1986).

Os soviéticos também sabiam das dificuldades adicionais que enfrentariam ao travarem uma guerra com tropas conscritas com um ou dois anos de treino e reservistas distantes até quinze anos de seu próprio serviço militar. Todos seriam chamados para preencher as divisões na hora da mobilização, movendo-se e combatendo num ritmo de 24 horas por dia, diante do furacão de fogo e da sucessão de emboscadas, refregas e batalhas que a OTAN colocaria em seu caminho (BAXTER, 1986). Por isso eles aceitavam e enfatizavam a incorporação de práticas invariáveis tanto na composição quanto no modo de agir das suas unidades. Sem a familiaridade e o automatismo conferidos pela constante repetição e pela mais rígida das disciplinas seria muito difícil seguir adiante. Sem regras e ordens impostas com firmeza não se alcançaria a fluência necessária para permitir atacar de forma sustentada com escalões sucessivos de diferentes tamanhos e qualificações (COCKBURN, 1983; ERICKSON, HANSEN; SCHNEIDER, 2019). Todavia, essa rigidez tinha seu preço: era extraordinariamente difícil recompor as armas depois que sofressem baixas, tão difícil quanto era compor, de forma oportunista, mesclas combatentes eficazes durante o desenrolar de um enfrentamento (ERICKSON, HANSEN; SCHNEIDER, 2019; GLANTZ, 1991).

Os tanques eram o elemento mais crítico de todo esse arranjo. Ao contrário das outras armas, que se podiam até certo ponto resguardar, os tanques tinham de estar necessariamente expostos em qualquer enfrentamento, e isso os tornava alvos prioritários do oponente. Dependia-se deles para liderar o ataque, apoiar a defesa, romper a linha e explorar a ruptura. Mais importante: era em torno deles que se articulava o todas-as-armas, e uma redução significativa em seu número implicava, primeiramente, a perda dessa capacidade. Por tudo isso era preciso ter um número generoso de tanques. E era justamente entre eles que se esperavam as perdas mais certas e numerosas (BAXTER, 1986; ERICKSON, HANSEN; SCHNEIDER,

2019; GLANTZ, 1991b; ISBY, 1988; ZALOGA, 1989). Isso levou a um esforço continuado, mas não particularmente bem-sucedido, de atualização técnica e aumento da produção de tanques de forma a viabilizar o incremento da dotação de cada unidade.

A meta de buscar superioridade convencional diante das forças da OTAN foi se tornando cada vez mais difícil de realizar entre meados dos 1960 e meados dos 1980. Havia duas dinâmicas significativas a restringi-la: a perspectiva de morbidade e declínio demográfico e a necessidade de capacidade industrial redundante para que se pudesse produzir as variedades e quantidades de armamentos necessários. A questão demográfica era inescapável e colocava diretamente em dúvida o funcionamento em escala do aparato de mobilização e prontidão das 210 divisões soviéticas. A questão industrial também, sobretudo porque a URSS entrava num período de estagnação econômica. Aceitar recompor as tropas com pessoal menos qualificado para que se mantivessem seus números punha em dúvida sua capacidade combatente. Ao mesmo tempo, ter todos os armamentos e equipamentos blindados mais atuais revelou-se além do alcance da capacidade industrial soviética (FRIEDMAN, 2007; HANSON, 2003).

Não havia o suficiente do melhor equipamento para todas as divisões, nem mesmo todas as divisões de primeira linha, que tinham prioridade em tudo. Isso explica por que decidiram combinar o regimento de veículos sobre lagartas e os dois regimentos sobre rodas nas Divisões de Rifles Motorizados, mesmo sabendo que isso levaria à perda de capacidade todo-terreno. Para que pudessem produzir mais veículos para a infantaria, os soviéticos acabaram decidindo manter grande parte da artilharia rebocada ao invés de montada em veículos blindados todo-terreno. Além disso, foram obrigados a conviver com os problemas decorrentes da impossibilidade de se padronizar os melhores armamentos de que dispunham, porque não havia escala suficiente na sua indústria e cada fábrica era especializada em determinados modelos, não podendo ser reconfigurada sem perdas inaceitáveis no volume global de produção (COCKBURN, 1983).

Quando a URSS chegou ao Afeganistão no final dos anos de 1970 não houve o que comemorar. Descobriu-se, com o passar dos anos, que muito do que se imaginava ter nos estoques em termos de equipamentos, partes de reposição, suprimentos e combustível era só isso: fantasia. Além disso, havia problemas reais nas qualificações física e técnica do pessoal das reservas (COCKBURN, 1983; REESE, 2000). De fato, o Afeganistão foi um contraponto melancólico à campanha vitoriosa na Manchúria.

4.4.2 **As Divisões Blindada e Mecanizada dos EUA**

Os EUA chegariam ao desenho das suas divisões pesadas em c. 1985, depois de passarem por cinco grandes momentos de ajuste, amplamente documentados, que se podem grosseiramente demarcar pelas passagens dos governos Truman, Eisenhower, Kennedy, Nixon e Ford, e Reagan. Da mesma forma que havia acontecido na Segunda Guerra Mundial, os EUA seguiriam concebendo e implementando planos e ações a partir e em função de uma perspectiva organizacional. Tal perspectiva se expressava na busca da melhor adequação de meios a fins diante das mudanças nas suas circunstâncias e direções políticas (CSI, 1999; DUNNIGAN; HAWKINS, 2013; HAWKINS; CARAFINO, 1997; KEDZIOR, 2000; MACEDONIA, 2001; STEWART, 2010; WILSON 1998;). No primeiro momento, durante o governo Truman (1944-1953), as poucas divisões blindadas mantidas na ativa depois de 1946 foram submetidas a um processo contraditório, por vezes até esquizofrênico. Nele, divisões foram desativadas e reativadas, enviadas ao exterior e repatriadas e tiveram seus desenhos expandidos e reduzidos. A divisão pentômica que expressava o '*New Look*' do governo Eisenhower (1953-1961) seria uma reconfiguração de todas as divisões para lidar com o campo de batalha nuclear e assim contribuir com a perspectiva estratégica de "Retaliação Massiva" (KEDZIOR, 2000; WILSON 1998).

Durante o governo Kennedy (1961-1963), houve uma reforma completa marcada pela percepção de que, para se ter capacidade de resposta flexível diante dos soviéticos, se fariam necessárias forças capazes de travar uma guerra sem armamentos nucleares. Isso levou a um novo e mais moderno desenho, as divisões ROAD, *Reorganization Objective Army Divisions*. Definiu-se uma base divisional comum para todas as divisões, que teriam três brigadas cada, com imensa flexibilidade na sua composição. Os batalhões de cada divisão seriam definidos para responder a uma contingência determinada e em função das suas circunstâncias e demandas específicas (KEDZIOR, 2000; WILSON 1998).

A evidente escalada em armamentos e tropas da URSS em meados dos anos de 1960 preocupava sucessivos governos estadunidenses. No governo Johnson (1963-1969), pouco se pode fazer diante do acirramento da Guerra Fria e do juízo de inferioridade técnica e numérica estadunidense diante do melhor soviético na Alemanha. Além disso, durante a guerra no Vietnã, os EUA tiveram de lidar com os efeitos organizacionais e combatentes de terem formado suas tropas a partir do alistamento obrigatório. Foram os governos Nixon (1969-1974) e Ford (1974-1977) que tiveram de lidar com essa situação, a começar pela reconfiguração necessária para que adotassem um exército todo voluntário. Com isso acumularam-se diversos resultados

estruturantes, dois dos quais de especial relevância para o desenho organizacional das divisões pesadas.

A criação do Comando de Doutrina e Treinamento, TRAining and DOctrine Command – TRADOC, em 1973, apontava para uma profissionalização intensa do exército, inicialmente ao garantir contratos mínimos de sete e usuais de catorze anos aos soldados. O TRADOC promovia uma integração sistêmica entre as atividades de ensino, preparo e exercício de pessoal em todos os seus aspectos, em substituição às soluções idiossincráticas de cada arma e quadro. Assim como teste e avaliação haviam sido críticos para garantir a confiabilidade do material na Segunda Guerra Mundial, o processo de ensino, preparo, treinamento e teste de desempenho do TRADOC foi crítico para garantir a confiabilidade de pessoal (ROMJUE, 1985; ROTTMAN, 1988).

Além disso, houve uma atualização no entendimento das condições de contorno que realmente viriam a reger uma guerra na Europa e como isso impactaria o modo de combater contra os soviéticos. Esse entendimento, materializado notadamente no manual de operações FM 100-5 de 1976, dava solução de desenho integrada diante de três questões: o desempenho dos armamentos já havia avançado para além do auge do estado da arte; a Alemanha Ocidental vivia um processo de intensa urbanização; e a URSS provavelmente só teria êxito numa guerra europeia se seguisse um cenário específico (HERBERT, 1988; US ARMY, 1976; WILSON, 1998).

Cada tipo de armamento dos EUA era capaz de elevada precisão de tiro, de dia ou à noite, em todas as condições climáticas, com capacidade de penetração e destruição suficiente para superar quaisquer blindagens ou medidas de proteção existentes ou que viessem a ser desenvolvidas pelos soviéticos nos dez anos seguintes. Somava-se a isso o progresso em munições guiadas, tanto para o tiro direto, como mísseis antitanque, quanto para o tiro indireto, como no caso das munições ditas inteligentes. Diante do que se aprendera com a Guerra Árabe-Israelense de 1973 e do alargamento no estado da arte no que tocava o desempenho dos armamentos, ficava claro que a conduta que ainda se praticava com base na experiência da Segunda Guerra Mundial precisava ser substituída por algo inteiramente diferente.

Em segundo lugar, a urbanização da Alemanha Ocidental havia transformado o entorno e os acessos às suas estradas e a vizinhança estendida de suas cidades e vilas. Em lugar de terreno aberto ou florestas, havia grandes zonas de concreto armado, com subsolos para garagens e redes de esgoto em cada lado de estreitas ruas de duas pistas. Havia também obras públicas em concreto ligando as zonas urbanas (ou suburbanas) e mais construções, também em concreto, em locais aprazíveis com largas vistas, como cruzamentos e elevações. Mesmo

que feitas em ruínas, essas obras e prédios dariam proteção contra quase todos os armamentos soviéticos, à exceção dos mais pesados.

Finalmente, em terceiro lugar, excetuado um ataque surpresa, ficava claro que toda esperança de sucesso dos soviéticos dependeria da sua capacidade de articular ondas sucessivas de atacantes que conseguissem exaurir as defesas da OTAN. Isso corresponderia ao provável modo de empenho dos numerados desde suas bases na URSS e na Europa Oriental, e de divisões e regimentos dos seus exércitos numerados.

A nova formulação da conduta que emergiria começou por abandonar a ideia da batalha limitada à linha de frente. Em seu lugar, articulou-se uma forma de combate que travava três batalhas simultaneamente: uma batalha de retaguarda, contra a infiltração ou exploração da ruptura pelo oponente; uma batalha de linha de frente, para forçar o desgaste do oponente e impedir uma ruptura, obrigando-o a se reorganizar ou a esperar o próximo escalão de ataque; e uma batalha profunda, na qual se atacavam os escalões adicionais do oponente, para impedir que produzissem um efeito cumulativo.

Essa reformulação, embora nascida na OTAN, implicava a ideia de integração das forças estadunidenses em todos os seus meios convencionais, e veio a se materializar na doutrina chamada de Batalha AeroTerrestre. A incorporação do Aero se daria a partir de duas questões, a primeira das quais já dada como certa: o imenso impacto do helicóptero, não apenas como sensor de reconhecimento, mas também como plataforma de fogos e de transporte de pessoal, armamento e suprimentos. A outra, ainda potencial, era a expectativa em relação ao que a Força Aérea pudesse vir a fazer com suas aeronaves antitanque, munições customizadas e munições inteligentes.

Enquanto isso, o Exército dos EUA tentava alinhar as suas capacidades a missões que satisfizessem ao grande número de cenários para o uso da força definidos pelo governo Carter (1977-1981). Como consequência desse processo, as divisões pesadas ficaram em segundo plano. Havia divisões blindadas e mecanizadas, mas nem seu armamento, nem sua conduta atendiam ao disposto no Manual de Operações FM 100-5 de 1976.

Diante do fortalecimento soviético, o governo Reagan (1981-1989) tomou a decisão política de aumentar substancialmente o orçamento estadunidense de defesa. Como consequência, duplicou-se o número de divisões pesadas a serem enviadas à Europa, e seus depósitos de armamentos e estoques de suprimentos foram expandidos de acordo. As forças pesadas dos EUA foram redesenhadas a partir da proposta do "Exército de Excelência" e sob o mote de "assoberbado pelos números e ainda assim vencer" para produzir um arranjo capaz de responder a um ataque soviético na Europa.

No novo arranjo, havia três corpos-de-exército pesados permanentemente compostos. Dois deles, com quatro divisões, uma brigada avançada de uma divisão e um regimento de cavalaria blindada, ficariam na Europa. O outro corpo-de-exército, com o restante da divisão, cinco outras divisões e um regimento de cavalaria blindada, ficaria nos EUA e seu pessoal seria transportado pelo ar até a Europa e usaria equipamentos lá estocados. De acordo com esse desenho, teriam quatro companhias por batalhão (aumentando seu tamanho em 1/3), e a artilharia pesada, mísseis antiaéreos e helicópteros poderiam ser deslocados para o comando dos corpos-de-exército (CSI, 1999; DAVIES et al. 2019; DUNNIGAN; MACEDONIA, 2001; SKINNER, 1989; ROMJUE, 1997; WILSON, 1998).

Chegou-se assim às Divisões Blindada e Mecanizada de 1983 (FIGURA 4.6 Divisões Blindada e Mecanizada estadunidenses (c. 1985)), cada uma com 17 mil combatentes, formalmente com três comandos configuráveis de brigada e partilhando de uma mesma base divisional. Cada divisão tinha nessa base divisional comum um batalhão de cavalaria blindada especializado em reconhecimento e retardamento (18+ tanques, 100+ combatentes de infantaria, 6 peças, 40+ mísseis antitanque, 10+ helicópteros), 72 peças e lança-foguetes, fortes contingentes de engenharia e antiaérea e ainda 50 helicópteros. Estes últimos eram ditos uma brigada de aviação, mas de fato, desde o primeiro momento, revelaram-se uma brigada, a quarta, como as demais. Haveria 4 batalhões mecanizados e 6 batalhões blindados na Divisão Blindada (somando 2,5 mil ou mais combatentes de infantaria, 450 tanques, 400+ mísseis antitanque), e 6 batalhões mecanizados e 4 batalhões blindados na Divisão Mecanizada (somando 4 mil ou mais combatentes de infantaria, 350 tanques, 500+ mísseis antitanque) (CSI, 1999; ROMJUE, 1985; ROMJUE, 1997; WILSON, 1998; KEDZIOR, 2000; DAVIES et al., 2019).

FIGURA 4.6 Divisões Blindada e Mecanizada estadunidenses (c. 1985)
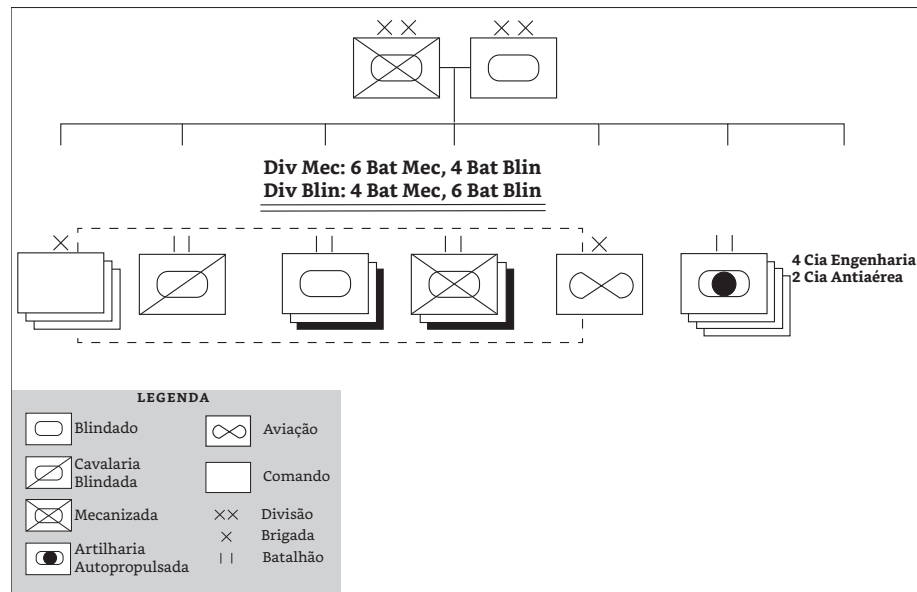
Fonte: Adaptado pelos autores a partir de CSI, 1999, p. 44.

Mísseis antiaéreos, artilharia pesada e helicópteros passariam ao comando do corpo-de-exército. Na Alemanha, o V Corpo, com duas divisões, teria 162 peças e lança-foguetes e 100 helicópteros e ainda subordinaria um regimento de cavalaria blindada (1,5 mil combatentes de infantaria, 180 tanques, 50 peças, 60 helicópteros, 100+ mísseis antitanque), representando o auge das armas combinadas dos EUA, capaz de qualquer tarefa. O VII Corpo, também com duas divisões, teria 243 peças e lança-foguetes e 100 helicópteros, e subordinaria diretamente uma brigada mecanizada (1,2 mil combatentes de infantaria, 70 tanques, 48 peças, 50+ mísseis antitanque). O III Corpo, nos EUA, a ser enviado 'em 10 dias', teria cinco divisões, duas brigadas mecanizadas, um regimento de cavalaria blindada, 243 peças e mais que o dobro de helicópteros dos dois corpos a avante. Tudo isso esperava apenas a chegada de pessoal aos depósitos de equipamentos completos e prontos na Europa. Incidentalmente, as tropas eram treinadas na vinda à Europa, reequipamento e disposição em campo para manobras regularmente, a cada ano em diferentes estações (STEWART, 2010; DAVIES et al., 2019).

Diante disso, se poderia argumentar que o projeto de força terrestre dos EUA teria deslocado o ponto ótimo de enquadramento da divisão para o corpo-de-exército. Isso é parcialmente verdadeiro, especialmente em relação a mísseis antiaéreos empregados no rumo de um arranjo unificado de defesa aérea da OTAN, cuja análise excederia o escopo deste artigo. Mas as divisões continuaram sendo o centro das armas combinadas. Era nelas que se concentravam de maneira quase completa as tropas de infantaria e blindadas, articuladas de fato

em quatro brigadas polivalentes, capazes de configurações customizadas para lutar 360º, 24/7, dia e noite, em qualquer condição climática.

Um último ponto é que o volume do estoque e a capacidade de distribuição de suprimentos dos EUA na Europa mais do que dobraram entre 1981 e 1985. Isso abrangia munições de todos os tipos, combustível com aumento da redundância e da capacidade avançada de reabastecimento e todos os arranjos necessários para a sua proteção. Também abrangia uma cadeia de distribuição capaz de armazenar seus estoques já nas configurações de cargas para transporte por caminhões fora-de-estrada e helicópteros e de alcançar unidades empenhadas no combate. Esse panorama de aumento da capacidade e resiliência dos EUA permite considerar que "lutar assoberbado pelos números e ainda assim vencer" fosse mais que mera locução retórica.

A Guerra do Golfo de 1990-1991 revelou em que grau a Batalha AeroTerrestre realmente representava o auge do estado da arte em conduta e desenho. Ela permitia a segmentação dos esforços e da força do oponente e a fluência no uso constante e otimizado das armas combinadas em toda a profundidade do dispositivo oponente. É oportuno chamar a atenção para quanto dessa capacidade é mesmo de enquadramento, preparo e fruto do que se pode ter e fazer em função de um desenho organizacional eficaz. No Iraque, os EUA tinham vantagem material em tudo, mas nem eram invulneráveis, nem possuíam armamentos que os dispensassem de combater (CORDESMAN; WAGNER, 1996; DUNNIGAN; MACEDONIA, 2001).

De fato, como os soviéticos contra os japoneses na Manchúria em 1945, os estadunidenses estavam numa outra classe. No entanto, muito da discussão de como venceram admite a consideração de que teriam vencido mesmo que os armamentos tivessem sido trocados. Isso porque as suas práticas de armas combinadas permitiriam explorar muito melhor os armamentos mais antigos do que seus oponentes poderiam fazer com os armamentos mais avançados. E isso também não deve ser tomado como mera retórica.

4.5 CONCLUSÃO

O satélite, a televisão e o computador transformaram profundamente o mundo a partir do final dos anos 1940. Apesar disso, quando se comparam os desenhos das divisões pesadas da URSS e dos EUA em 1945 e c. 1985, ficam claras a continuidade da sua concepção e a convergência nos juízos de cada superpotência, fosse em relação à centralidade das armas combinadas para projetos de força terrestre; à importância da escala para se permitir

desdobramento da força no espaço e sua duração no tempo; e à identidade das armas em relação a capacidades combatentes e variedade de equipamentos. Tudo isso se materializava num ponto ótimo de escala e escopo: a divisão (de 10 mil a 20 mil combatentes). Isso se deu mesmo diante do contexto e situação de cada uma e das restrições que enfrentavam para elaborar e pôr em prática seus respectivos projetos de força.

E nos últimos 30 anos? O que se pode dizer dessa passagem diante do que se argumentou a respeito de ótimos de escala e escopo para poder combater com armas combinadas? Afinal, entre 1990 e 2021 se observou o deslocamento do cerne do projeto de força terrestre para a brigada (de 3 mil a 5 mil combatentes). Entretanto, não parece possível argumentar que esse caminho tenha resultado num alargamento do estado da arte bélico. Ao contrário, se verá que desde início da década de 2010, a Rússia vem retomando o desenho divisional a despeito das suas significativas restrições de recursos e pessoal, e, além disso, que perspectivas por vezes contraditórias em torno de como se deveria desenhar o projeto de força estadunidense não permitem ainda compreender como se daria a próxima reorganização nas suas forças.

Uma breve recapitulação e comparação das divisões da URSS e dos EUA em 1945 e c. 1985 evidencia a continuidade em concepção e permite indicar como diferenças nas suas escolhas se deram em função dos seus contextos e situações particulares.

O desenho das divisões soviéticas de c. 1985 seguiu o mesmo enquadramento e proporção de armas dos corpos de 1945: 3 + 1 + 1 (de artilharia) e (…) frações de 1 para tudo, 'mais do mesmo', buscando assegurar que se teria o necessário para agir com armas combinadas de maneira regular e previsível (FIGURA 4.7 Comparação do Corpo de Tanques (1942-1945) e da Divisão de Tanques (c. 1985) soviéticas e FIGURA 4.8 Comparação do Corpo Mecanizado (1942-1945) e da Divisão de Rifles Motorizados (c1985) soviéticas).

FIGURA 4.7 Comparação do Corpo de Tanques (1942-1945) e da Divisão de Tanques (c. 1985) soviéticas
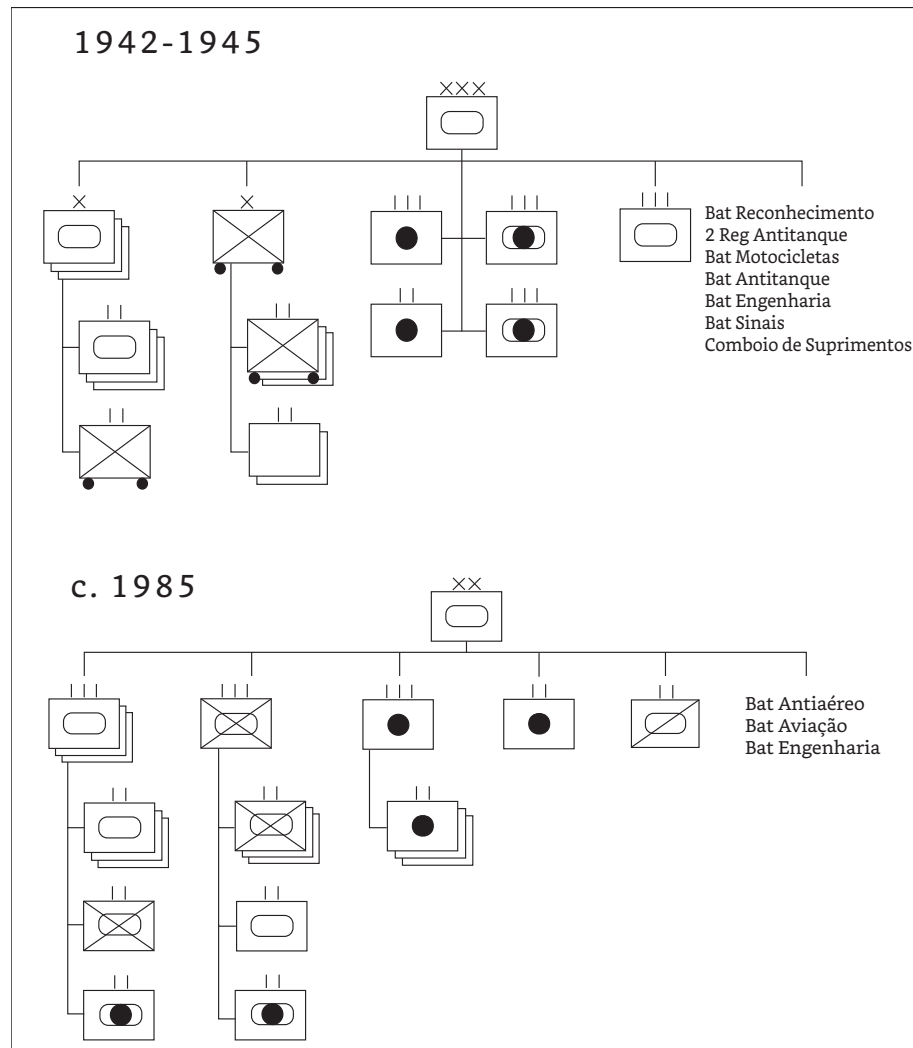
Fonte: Adaptado pelos autores de Dunnigan, 1977, p. 120 e US Army, 1991, p. 4-112.

FIGURA 4.8 Comparação do Corpo Mecanizado (1942-1945) e da Divisão de Rifles Motorizados (c1985) soviéticas

1942-1945

Bat Reconhecimento
Reg Antitanque
Bat Motocicletas
Bat Antitanque
Bat Engenharia
Bat Sinais
Comboio de Suprimentos

c. 1985

Bat Antitanque
Bat Antiaéreo
Bat Aviação
Cia Engenharia
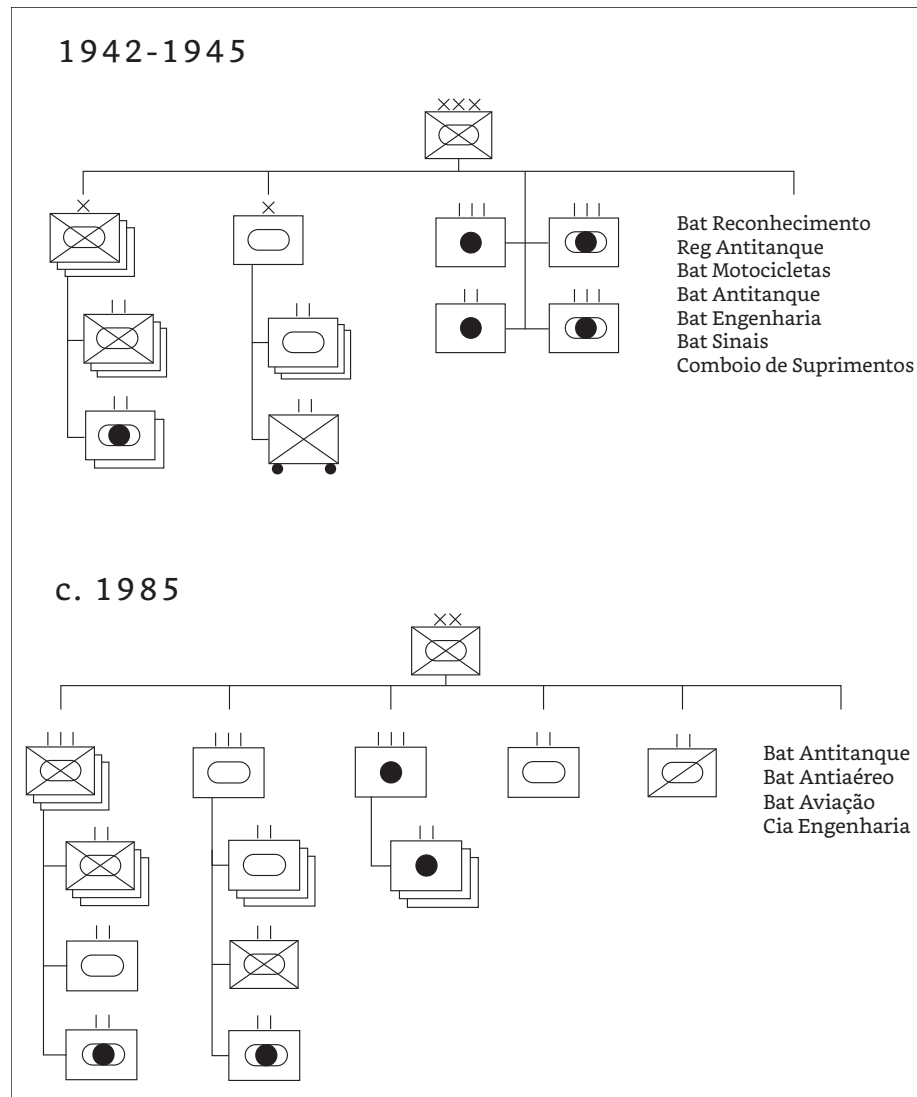
Fonte: Adaptado pelos autores de Dunnigan, 1977, p. 121 e US Army, 1991, p. 4-37.

No caso soviético, a ausência de artilharia centralizada e de suprimento motorizado na Segunda Guerra Mundial foram contingências inicialmente sanadas a partir de ganhos de desempenho técnico, permitindo assim o desenho das suas forças com a ambição de praticar armas combinadas no estado da arte. Apesar disso, as divisões soviéticas da Guerra Fria tiveram que lidar com restrições de ordem material e de pessoal que se acentuariam ao longo dos anos de 1970 e 1980. Por conta delas, não foi possível continuar atendendo às demandas de cada arma por veículos blindados, e teve-se de aceitar essas restrições e seus efeitos no combate, como a perda de capacidade todo-terreno de grande parte de sua infantaria motorizada e artilharia. Uma outra questão era que a maior parte da tropa provinha do serviço militar obrigatório, e isso limitou o quanto era possível capacitá-la. Como solução, escolheram adotar

condutas e práticas combatentes rígidas, invariáveis, e compor as tropas em escalões de grandes dimensões que deveriam lutar numa única direção em cada momento, também tendo de aceitar os efeitos disso no combate, como reverter mais uma vez ao todas-as-armas.

O desenho das divisões estadunidenses em c. 1985 também seguiu o mesmo enquadramento que o de 1945. A partir dele se buscou assegurar a formação de capacidades e a disponibilidade de equipamento para que pudessem compor mesclas combatentes de armas combinadas de maneira flexível e oportunista (FIGURA 4.9 Comparação da Divisão Blindada (1943-1945) e das Divisões Blindada e Mecanizada (c. 1985) estadunidense)

FIGURA 4.9 Comparação da Divisão Blindada (1943-1945) e das Divisões Blindada e Mecanizada (c. 1985) estadunidense
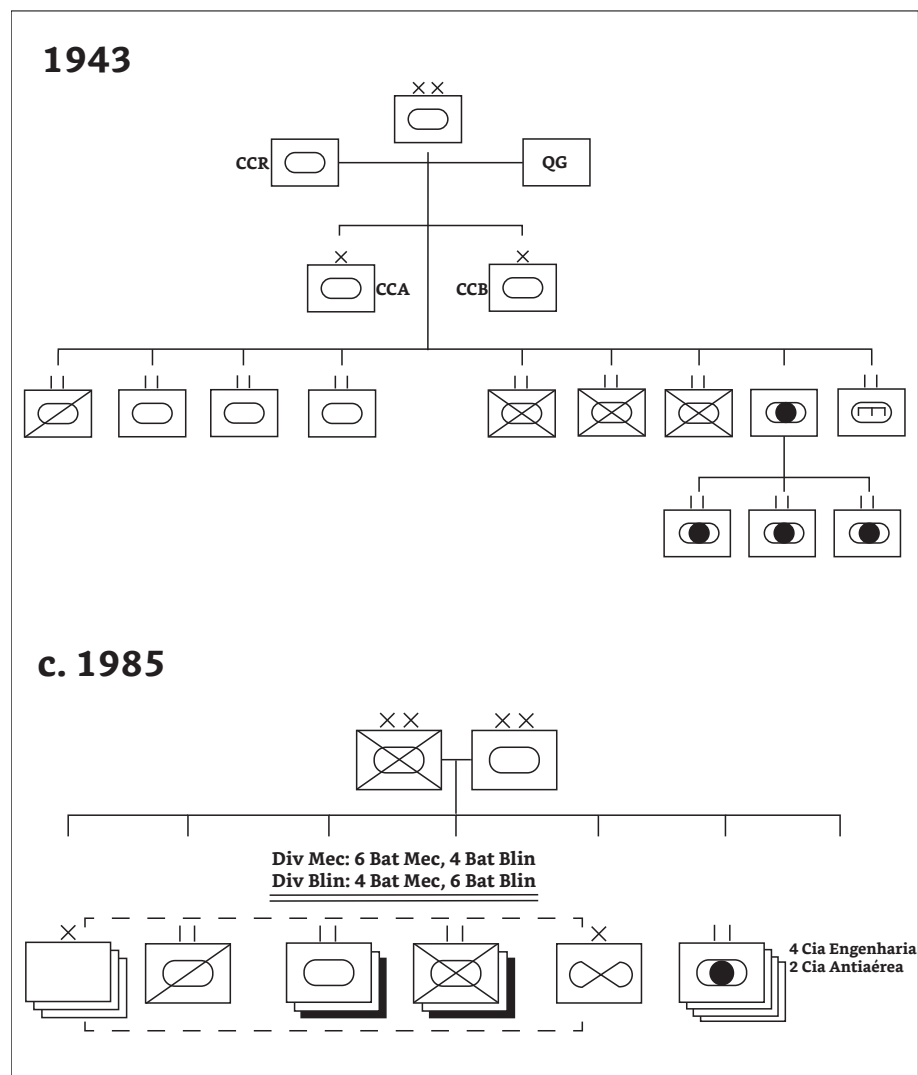
Fonte: Adaptado pelos autores a partir de Zaloga, 2004, p. 13 e de CSI, 1999, p. 44.

No caso estadunidense, a disponibilidade de pessoal capacitado, armamentos, equipamentos e suprimentos levou a um alargamento no estado da arte de armas combinadas.

Na Segunda Guerra Mundial, os EUA puderam ter tropas todo-terreno com seus meias-lagartas e artilharia autopropulsada e vieram a dispor de artilharia integrada em toda a força. Na Guerra Fria, após um período inicial em que se viram superados pelos soviéticos, os EUA reconfiguraram as suas forças a partir da profissionalização da tropa e da unificação da sua doutrina combatente no TRADOC. A sua escolha foi por traduzir ganhos de desempenho técnico em ampliação de capacidade combatente, levando a uma divisão de grandes dimensões pautada por composição e conduta flexíveis, capaz de lutar em 360º, 24/7, todo-clima, todo-terreno. Com isso, puderam fazer do helicóptero uma nova arma combatente montada, ao contrário dos soviéticos, que só conseguiram incorporá-lo como mais um armamento, e dispor de estoques e cadeias de distribuição na Europa que lhes permitiam compor unidades combatentes pelo simples transporte do pessoal desde os EUA.

Tanto no caso soviético quanto no estadunidense, percebe-se que o que se tinha em c. 1985 atualizava o que se ambicionara em 1945. Não por inércia, mas porque se entendia que a solução e o enquadramento para a questão das divisões pesadas haviam permanecido os mesmos. Ambas as superpotências tinham um mesmo conjunto de expectativas em termos de escopo e escala diante de um estado da arte partilhado. A continuidade do desenho de suas divisões expressava um juízo comum quanto à estabilidade das armas, à centralidade das armas combinadas para o projeto de força e ainda quanto às dimensões e capacidades necessárias para se porem no espaço e no tempo de forma a produzir vantagem combatente. É desse modo que se pode explicar a manutenção da divisão como cerne de seus projetos de força.

Mesmo assim, atualmente há diversas tentativas de deslocar o cerne do projeto de força terrestre para a brigada. Há diversas razões que podem explicar decisões nesse sentido, cuja longevidade já alcança 30 anos. Inicialmente, havia a viva expectativa de que se poderiam reproduzir no mundo bélico os ganhos em escala e escopo que a digitalização produziu no mundo civil. Por isso, a escolha da brigada não se deu diante da certeza de perda de capacidade combatente. Esperava-se poder fazer o mesmo em termos de armas combinadas, só que gastando menos (DUNNIGAN; MACEDONIA, 2001).

Desde então, vinha parecendo que a brigada se mostraria suficiente. Os conflitos armados durante esse período não envolveram sociedades capazes de se enfrentar com armas combinadas, não tiveram grandes dimensões, nem duraram por muito tempo. E assim, não foi possível observar qualquer problema maior com as brigadas até que a Rússia tivesse decidido, por volta de 2010, retornar à divisão.

A sua escolha pelas brigadas se dera em 1992, a partir da realidade de que se havia material de sobra (herdado da URSS), havia pessoal qualificado de menos. Isso levou a diversas

composições de conscritos, contratados e profissionais, todas insatisfatórias. Além disso, a escala de efetivos das brigadas não guardava qualquer compatibilidade com o escopo combatente desejado, e foi ficando claro o quão difícil seria dar sentido de prontidão e disponibilidade à força dali resultante. Descobriu-se que as únicas tropas competentes eram as remanescentes da estrutura divisional soviética e foi com essas que se pôde obter sucesso nas guerras travadas nas décadas de 1990, 2000 e 2010. Por conta disso, algumas divisões foram sendo preservadas e outras reativadas, até que se acabou retomando o desenho divisional como cerne do projeto de força russo (GLANTZ, 2010; GALEOTTI, 2017; RENZ, 2018).

A restauração do 1º Exército de Tanques de Guardas (1º ETG) em 2014 é o exemplar mais consequente desse retorno à divisão. Uma análise mais detalhada dessa unidade extrapolaria o escopo deste artigo. Entretanto, é suficiente apontar que o desenho do 1º ETG e das demais unidades que o seguiriam corresponde a uma divisão pesada no estado da arte das armas combinadas. Tem ao redor de 20 mil combatentes com ao menos seis regimentos, artilharia centralizada, comboio de suprimentos e unidades de helicópteros, drones, ciberguerra e armamentos eletromagnéticos. Poderia lutar 360° e sustentar a luta 24/7, todoclima, todo-terreno (BRONK, 2017; CRANE, OLIKER; NICHOPORUK, 2019; IISS, 2016; SUTYAGIN).

Um outro efeito importante do retorno de uma divisão pesada à cena foi a reconfiguração do equilíbrio de forças na Europa, que vinha sendo medido em termos de brigadas e do que elas podiam fazer. Tentar barrar uma unidade como o 1º ETG apenas agremiando brigadas significaria lutar em considerável desvantagem. Na prática, isso significava que não se teria como responder a um gesto militar russo que empregasse uma ou mais unidades como o 1º ETG com expectativa razoável de sucesso (MARTYANOV, 2018; FLANAGAN et al., 2019).

Nos EUA, os limites da brigada se colocaram por razões e de maneiras distintas, em decorrência de um impasse entre três perspectivas de projetos de força por vezes contraditórias entre si. Todas elas guardam, em comum, a expectativa de que a digitalização eliminaria a divisão e o corpo-de-exército (MACGREGOR, 1997) e levaria a um guerrear centrado-em-rede que se travaria integrando armas e brigadas (MANDELES, 2005).

A primeira perspectiva é a expedicionária, a partir da qual se devia trocar tanques e veículos sobre lagartas por carros blindados e veículos sobre rodas para poder dispor de brigadas médias e de infantaria leve. Essas brigadas podiam ser configuradas em escopo de armas e escala de efetivo para cada missão e movidas pelo ar desde os EUA (DUNNIGAN; MACEDONIA, 2001; STEWART, 2010). A segunda envolve usar divisões não mais como instância de escala e escopo combatente, mas sim como residência administrativa para brigadas

de um ou mais tipos. Isso significa que elas podiam abrigar brigadas pesadas, médias, de variedades de infantaria, aviação, suporte e outras para atender a diferentes cenários (STEWART, 2010; BROWN, 2011; CANCIAN, 2020). Uma terceira e mais difusa perspectiva decorre do aprendizado da longa "guerra global contra o terrorismo". Esta foi marcada por missões de segurança, contra-terror e contrainsurgência e pelo uso preponderante das tropas de infantaria para guarda, patrulha, incursões e atividades cívico-militares. Do ponto de vista dessa realidade viva e inculcada, o escopo de armas combinadas era pouco relevante e a escala da divisão era mesmo inapropriada (MACGREGOR, 2003; STEWART, 2010).

O efeito disruptivo do convívio dessas diferentes perspectivas vem sendo agravado por sucessivas revisões no orçamento do Exército dos EUA desde meados dos anos 2000 (CANCIAN, 2020). Essa situação tem praticamente imobilizado o processo de modernização de competências em armas combinadas e ameaçado a integridade do projeto de força terrestre estadunidense (BROWN, 2011; MARTYANOV, 2018; MCCONVILLE, 2021). Entretanto, agora em 2021, tem-se o borbulhar de mais uma perspectiva, distinta das demais, que reconhece a necessidade de se retomar armas combinadas com fluência. Em termos de escopo, haveria armas combinadas expandidas por múltiplos domínios, ciberguerra, drones e uma variedade de possibilidades outras que não estritamente de guerra. Em termos de escala, seria necessária a capacidade de lidar com oponentes dispondo de forças do porte do 1º ETG. Isso traz, ao primeiro plano, mais uma vez, a questão do desenho organizacional da força (MCCONVILLE, 2021).

Observam-se, portanto, evidências no sentido de apoiar a retomada da divisão e a continuidade da relevância da agenda de pesquisa que estuda as questões que se apresentam em função disso, em especial diante da ascensão dos drones e de outras formas de guerrear. Esse resultado não chega a ser surpreendente. Uma vez que se encaminham as questões de escala e escopo, percebem-se os limites da brigada, e torna-se necessário reconsiderar, mais uma vez, a utilidade do desenho da divisão como cerne do projeto de força terrestre.

5. AN END TO ETERNITY? VILÉM FLUSSER, CONTEMPORARY WAR AND MULTIPOLAR GEOPOLITICS.

5.1 BEGINNING

Thermonuclear catastrophes are not required to put an end to history, since history will end automatically.
Universo das Imagens Técnicas, p. 85.

This essay is meant as a reflection, both in the sense of a mirror image and of an afterthought. It is a mirror image of what came before in this doctoral dissertation, and, much like modern rearview mirrors, the objects it reflects are probably closer than they appear, though that is not how it feels. After all, those articles are and have been in the past, some of them for years. It is also an afterthought, quite literally, as it attempts to communicate present ideas regarding the future of our field of study, though that is also not entirely truthful, because once anything is committed to writing it is necessarily made to stand still until the media on which it was written decays into nothingness, while time marches inexorably on, though at this point is has become unclear if it really marches on or just collapses upon itself.

Its *dramatis personae* includes one philosopher — Vilém Flusser —, or perhaps more aptly, a portion of his conceptual work, and the interrelated study objects of strategy and geopolitics.

Academic rhetoric dictates that I now describe how Flusser comes to bear on those interrelated objects, what might be learned from doing so, how those results engage a particular academic community, and, finally, their overall significance.

That it occurs to us that one is supposed to move forward with these things in such a fashion results from more than academic etiquette. More fundamentally, it results from a particular technology we have always taken for granted: written texts. The linearity of written texts' great gift (or curse) to humanity is to have plunged us all in the flow of time, and, while doing so, to have given us historical consciousness and the ability to rise above 'phenomena' and 'events' so as to analyze them logically and ethically. Without writing and written texts, there would be no conceivable scientific method, because there would be no understandable relation between cause and effect. If this essay begins in a capitalized word, as sentences almost always do, it is that we, according to Flusser, are and have been moving beyond writing — at least, as humans have existentially conceived of writing —, into a world of technical images. This will bear important consequences as to how we make ourselves able to conceive of and communicate our understanding of the world we live in to the people we relate to.

But, unfortunately, this essay has no full stop. There is no conclusion. As such, there is no rising above, no detachment and we must recognize we are still in the middle of it. This is most un-academic. One could argue that, in the hands of a more competent author, the reader would not be subjected to such a problem. In my defense, there are deeper issues at work here: the use of a linear, one dimensional media (writing), to speak of a zero-dimensional media (technical images), to begin with. The difficulty of speaking of how the interrelated objects of strategy and geopolitics, deeply rooted in historical consciousness, might come to be thought, and spoken of, as this cultural shift into the superficiality of the technical images takes deeper and deeper hold of our reality. The provocative nature of Flusser's thought.

And, most of all, the discontentment underlying the whole effort.

Since the end of the Cold War, and until the late 2010s, the United States has acted (and largely been seen as) a *de facto* hegemon. How it had managed to do so while remaining largely unchecked, in spite of no significant evidence of its ability to project meaningful military power, (unless one chooses to count as such victories against mostly toothless opponents), is an interesting question. That *de facto* hegemony is now being tested — with alarming results for the Americans — by the rise of Russia and China, and a more assertive reorganization of countries representing a significant share of the world's economic output (and consumption), natural resources and energy production.

That this has happened (and is happening) in spite of the head start the US has had since the days of Yalta and Bretton Woods and of the technological means and financial alternatives at its disposal, not to mention its Cold War victory, is, of course, a topic for historical study. Other possible related questions include what can be made of the demise of International Law, of the West's sense of ethical responsibility, and, more to the point, of its ability to conduct strategy in the Clausewitzian sense: to achieve political aims by compelling others by the use of force.

Such questions would traditionally be framed within particular discourses. For example, sciences, both "hard" and social, to describe, explain and predict phenomena and establish causal connections, regarding commanding a wartime economy, military doctrine and organization, the technologies of fighting and matériel, the mobilization and motivation of troops and civilians; and politics, to characterize choices regarding ends and means made by polities based on ethical considerations. Furthermore, they would be purposefully framed, so that their answers might prove useful in preparing and guiding work, according to each polity's preferences, considering constraints and restrictions uncovered as part of the inquiry.

To frame these and other questions in the field of strategy and geopolitics from the standpoint of a philosophy of communication might appear as a *prima facie* futile exercise. After all, what would such a framework have to say about the materiality of war and strategy?

And this is the source of discontentment. It is precisely because this cultural shift is pushing us away from the written text, but not, at least not yet, to the point where most of us have forgotten its uses. So it will still feel that regardless of how pervasive technical images are or might come to be, studying and conducting strategy, making war and all the societal choices associated with these processes will always count on the discourses that have existed due to written texts. That this is a cultural and technological shift that will speed things up, miniaturize them even further while at the same time failing to change anything fundamental in the gestures we make to conceive of and exist in the world — including those related to strategy. After all, *plus ça change, plus c'est la même chose.*

This essay goes against that grain. It attempts, and very modestly so, to tread in Flusser's footsteps, in an exercise whose sole aim is to discuss how the gestures associated with studying and conducting strategy and making war might come to change if we admit that this cultural shift is indeed upon us. As such, it bears some hope to engage the reader in the sort of dialogue that is typical of written texts. In this sense it is markedly reactionary. Perhaps another cause for discontentment.

5.2 PREPARATION

[A] história da cultura não é série de progressos, mas dança em torno do concreto. No decorrer de tal dança tornou-se sempre mais difícil, paradoxalmente, o retorno para o concreto
Universo das Imagens Técnicas, p. 20.

What is new about the new is its very indescribability, and that means that what is new about the new consists exactly in the absurdity of wanting to explain it.
Script: Does Writing Have a Future, p. 151.

According to Flusser we are moving beyond history.[1] The study and conduct of strategy and its most dramatic manifestations, war and warfare, are historical gestures. By that I mean that they are gestures whose current, recognizable form came to be under the age of linearity: the cultural paradigm of the written text.

(According to Flusser,) we are moving into a world of technical images and the apparatus and programs that enable their creation and dissemination. The deeper we immerse ourselves in the program and the more we allow ourselves to be entertained by the images, the more prone we will be to dispense with the materiality of the outside world.[2] Our decisions, including those related to the study and conduct of strategy, will increasingly be made from within the program, from choices made available by the programmer. They will most likely be influenced by images and lead to the production or dissemination of more images. This is to say that related gestures will be directed at apparatus, instead of at the world; and that everything — or at least, everything significant — will occur within the program, in an ever more closed feedback loop.[3]

(Still according to Flusser,) in the course of this transformation we will find ourselves mostly groundless, because the discourses that have, until now, made existentially fruitful relations with the world and with each other a possibility are facing an unprecedented crisis.[4] Science has dislocated philosophy and religion's ethical authority and replaced it with a hollow

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[1] This is a recurring theme throughout Flusser's work. See, generally, Flusser, Vilém. *O universo das imagens técnicas: elogio da superficialidade*. São Paulo: Annablume. 2008. Hereinafter "*Imagens Técnicas*"; Flusser, Vilém. *Pós-História: vinte instantâneos e um modo de usar*. São Paulo: É Realizações. 2019 (originally published by Duas Cidades in 1983). Hereinafter "*Pós-História*"; Flusser, Vilém. *Script: Does Writing have a Future?* Translated by Nancy Ann Roth. Minneapolis, MN: Univ. of Minnesota Press. 2011. (Originally published as Die Shrift. Hat Schreiben Zukunft? by European Photography, 2002, original publication date, 1987). Hereinafter, "*Does Writing have a Future?*"; Flusser, Vilém. *Gestures*. Translated by Nancy Ann Roth. Minneapolis, MN: Univ. of Minnesota Press. 2014. (Originally published as *Gesten: Versuch liner Phänomenologie* by Bollmann Verlag, 1991), hereinafter, "*Gestures*"; and Flusser, Vilém. *Filosofia da caixa preta: ensaios para uma futura filosofia da fotografia.* São Paulo: Ed. Annablume, 2013. (Originally published as *Für Eine Philosophie der Fotografie* by European Photography, 1983), hereinafter, "*Filosofia da Caixa Preta*".

[2] Cf. *Imagens Técnicas*, pp. 80 *et seq.*, *passim*; *Pós-História*, "Nosso Programa", Ch. 3, *passim*.

[3] Imagens *Técnicas,* pp. 81 *et seq*.

[4] Cf. *Does Writing Have a Future,* Ch. 1; *Gestures, "The Gesture of Searching"* pp. 146 *et seq*.

quest for formalism.[5] We constantly search for answer as to "how," but not to "what for."[6] This leaves us little to no ethical ground from which to value our choices as we seek to transform the world through meaningful work. And this, of course, includes transforming the world through strategy and war.

These are the main Flusserian ideas I wish to present as I attempt to discuss the significance of these changes to the study and conduct of strategy and war by means of a series of examples.

However, a caveat is in order. This essay neither offers a critique nor a synthesis of Flusser's work. There are many reasons for it, the first of which being that to fully grasp any of Flusser's significant works one must read them in more than one language, usually Portuguese and German, given that Flusser himself would rewrite his works in different languages, with significantly different results in each time, a possibility that was beyond my time and language constraints.[7]

Furthermore, I recognize that my account of Flusser's ideas remains, to large extent, impressionistic. Even so, I would argue this comes with the territory given the breadth and complexity of Flusser's work. While there are certain recurring motifs, such as the crisis in Western culture;[8] the shift to a telematic society;[9] and the probable demise of writing as a technology that enables understanding,[10] to mention those more relevant to this essay, their recurrence is by no means redundant. Indeed, in each passing text (or version, or translation,)

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[5] Cf. *Pós-História,* Ch. 5, "Nosso Saber".

[6] *Ibidem*; *Gestures,* "The Gesture of Searching", *passim.*

[7] Indeed, given the impossibility of taking any version, in any language, as final, trying to interpolate different versions of any of his texts to reach a starting point for a synthesis or substantive critique could be considered a largely "pointless" enterprise (See the translator's introduction in Flusser, Vilém, *Post-History*. Translated from Portuguese by Rodrigo Maltez Novaes, Edited by Siegfried Zielinski and Normal Baitello Junior. Minneapolis, MN: Univocal Publishing, 2013, p. X.). To highlight this issue, one of Flusser's works cited in this essay, *Pós-História,* was read in Portuguese, though there were four different typescripts (two in Portuguese, two in German) and two additional partial versions of this work (in French and English) that the translator of the English version had to contend with (*Ibidem*, p. XI); *Into the Universe of Technical Images,* penned in Portuguese and German, was read in Portuguese, even though a translation from German to English is available; *Script: Does Writing Have a Future*? written in German, and translated by others into English and Portuguese, was read in the English translation; *Gestures,* written and originally published in German (and partially translated into Portuguese, though not by Flusser himself), was read in the English translation; and, finally, *Towards a Philosophy of Photography*, written and originally published in German and later rewritten by the author in English and Portuguese, was read in Portuguese (See, generally, Lenot, Marc. *Für eine Philosophy of Caixa Preta: Critical textual analysis of the different versions of Vilém Flusser's book Towards a Philosophy of Photography and a short history of its editions.* Flusser Studies 30, available at: https://www.flusserstudies.net/sites/www.flusserstudies.net/files/media/attachments/lenot-critical-textual-analysis.pdf, accessed April 2, 2023.).

[8] See, generally, *Pós-História, Gestures, Imagens Técnicas, Does Writing Have a Future.*

[9] See, generally, *Imagens Técnicas, Pós-História, Gestures, Does Writing Have a Future.*

[10] See, generally, *Does Writing Have a Future, Ch. 1,* "Superscript"; *Gestures*, Ch. 3 "The Gesture of Writing".

they show growing erudition and maturity, the constant evolution in Flusser's thought and his willingness to challenge his own preconceptions. Indeed, they add layers of nuance and complexity to an already complex and profoundly original material that would probably require an academic lifetime to allow it be dealt with the justice and depth it most likely deserves.

For those reasons, one way to read this essay is as exploratory evidence in a case brought before an adjudicator — the reader — called to rule on the relevance of the consequences it depicts and the soundness of the arguments made along the way.

Finally, I have deliberately attempted to avoid either objectifying or dealing with the subject-matter of this essay through a(nother) step towards abstraction. As such, study subjects, namely the gestures of studying and conducting strategy and making war, will be considered in relation to the intentionality betrayed by their existence.[11] This is to say they will be considered subjectively, as part of our concrete experience, the product of a phenomenological inquiry as to how they are (or might be) consciously perceived by those who study and conduct strategy and make war. This is in line both with Flusser's thought and with Clausewitz's epistemology in *On War*.[12] Even though Clausewitz sought to derive the 'mechanics' of living forces much as Newton had derived the mechanics of inanimate objects before him, he was critical of attempts at epistemological grounding in pure abstraction, in sterile axioms, in sum, in any stance that severed their study subjects from the context of human experience. On the contrary: even though Clausewitz named his categories in a vein comparable to that of the prevailing scientific discourse of his day, his study was always directed at actual human practice and interests, even when dealing with inanimate objects (terrain, for one example). So, once we venture beneath the veneer of 19th Century scientific rhetoric, we can see that his study method was indeed phenomenological, even though the term would only acquire its contemporary meaning after Clausewitz's time.

The gesture of writing results from two distinct intentionalities: the first, to overcome resistance (of the writing media, the alphabet, the words themselves as constrained by grammatical, syntactical, logical and rhetorical rules); the second, to reach an other. When we write, we are aiming both at the page and beyond it.[13] And we do so to express something — the text —, something that has, and can only have sprung into existence as a result of the gesture

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[11] *Gestures*, p. 135.

[12] Clausewitz, Karl von. *On War*. Translated by Peter Paret. Princeton: Princeton University Press. 1989. Chapters I-1 and I-2, *passim*.

[13] *Does Writing have a Future?* pp. 6 *et seq*.

of writing. In Flusser's own words, "the gesture of writing is the answer to the question: 'What am I trying to express?' " [14]

Writing is one among other gestures of thinking. The relationship between the whispered sounds of language in our minds and the message we wish to express, and the linear character of writing (which, in the occidental tradition, begins in the upper left corner of a page, proceeds to the right, then jumps back to the left right below the preceding line)[15] led mankind to perceive the world as a series of unfolding processes and events.[16] Writing was not only responsible for launching the flow of time as a concrete, perceived experience. It also allowed one to abstract by structuring thought conceptually to analyze, group and compare. In the West, the gesture of writing led to historical consciousness, and, further down the line, to logical thinking and the scientific method.[17]

In prehistoric times — in other words, prior to written texts — the prevailing gesture that allowed mankind to apprehend their experience of the world was the creation of traditional images. These images fixed visions of a lived (or imagined) circumstance into a scene, abstracting a tridimensional experience of being-in-the-world to a two-dimensional image.[18] However, to act according to an image was not to explain it. It was necessarily an unexplainable gesture, because the level of abstraction required to offer explanations (or any sort of reflexion) would only become reachable after the development of the alphabet.[19] There was no 'interpretation' of a traditional image because there was neither art criticism nor any other form of criticism, for that matter. Pablo Picasso's supposed lament as he exited the cave, "after Altamira, all is decadence"[20] would have been impossible in the absence of writing and historical consciousness. The ambiguity that surrounded a traditional image and the circumstance it depicted led to circular, magical, ahistorical thinking and this would remain the state of things until the diffusion of writing and written texts.[21] Here there was neither past nor future: there was only a circular return to the present as one lived (or relived) both circumstance and image, which remained unfixed in time.

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[14] *Gestures*, p. 22.

[15] *Idem*, pp. 22; 24.

[16] *Imagens Técnicas*, p. 15.

[17] *Gestures,* pp. 32 *et seq., passim*; *Does Writing have a Future?,* pp. 6 *et seq., passim.*

[18] *Imagens Técnicas*, pp. 14-16.

[19] *Ibidem.*

[20] Eire, Carlos. *A Very Brief History of Eternity.* Princeton, NJ: Princeton University Press. 2009. p. 10.

[21] *Does Writing Have a Future?* pp. 5-7.

Written texts can also represent imagined scenes. However, unlike traditional images they are one-dimensional. Writing strings concepts and ideas together according to shared codes (the alphabet and derived rules of logic, grammar and rhetoric) much like beads on a string. As such, it allows us to order our existence according to those rules: thinking directionally, logically; calculating, philosophizing.[22] In sum, writing allows us to translate "the imaginary into the conceptual; out of scenes into processes; out of contexts into texts."[23]

However, different writing technologies led to different experiences of historical time. Their unstoppable progress since the advent of industrial machines and computer programs has been constantly raising the tempo, blurring lines and contributing to a growing sense of groundlessness. Until the advent of apparatus that allowed continuous notation this was not the case. In the ages of the stylus, the brush, the quill, the pen and even the typewriter, the gesture of writing was always subjected to interruptions, most notably to refill an inkwell, a cartridge or change a typewriter ribbon. During those interruptions people could then enter the contemplative state from which critical thinking emerged. Thus, our thought structure itself was a function of our pauses and reengagements with writing the text that expressed it. While historical consciousness only really emerged after the passage from inscription to notation (in other words, from the stylus to the brush) and the acceleration of time that came with it, apparatus have created an untenable situation, in which we eschew reality in favor of unending progress, since apparatus can produce text continually. Furthermore, to leave all writing to apparatus is to also leave all "progress, historical thinking and action" to them.[24] And, if we did, where would that leave us existentially?

The study and conduct of strategy and war as we know them to be are deeply rooted in historical consciousness. For Hans Delbrück's military history, Karl Von Clausewitz's theoretical masterpiece, Mikhail Tukhachevsky's operational art manuals — to name a few examples —, were all the result of situated states of the art regarding historical analysis, scientific and mathematical concepts, geography, political objectives and constraints and heuristics to support decisions and actions on the field, none of which would have come to be were it not for writing.

However, our relation with written texts is undergoing significant changes. This is mostly (though not only) because we are and have been shifting to the cultural paradigm of

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[22] *Does Writing Have a Future?* pp. 5-7.

[23] *Idem,* p. 15.

[24] *Idem*, pp. 20-21.

technical images and becoming more and more immersed in the programs and apparatus that allow us to create and consume them.

Similarly to traditional images, technical images also depict scenes. But the similarities end here. The differences are four-fold, and easier to illustrate by comparison: how they are created; what they represent; the gestures involved in their creation; and their ontological position in a history of culture.

Traditional images are created by a gesture of abstracting a three-dimensional scene into a two-dimensional image.[25] These scenes result either from viewed or imagined circumstances as informed by previously existing images. A corpus of traditional images corresponds to a particular symbolic tradition, and subsequent images can either propel this tradition 'forwards' (by incorporating new symbols which can be "deciphered" against the existing corpus) or decay into noise (if they are deemed undecipherable due to being disconnected from the existing tradition).[26] Once a circumstance has been depicted in an image, humans can act accordingly. They can follow the image.[27] Though, as mentioned earlier in this text, they interpret the image circularly, not causally (which results in mythical or magical thought). This has to do with how an image is scanned by the eye: there is no 'before' or 'after.' We take one element in, move on to another, then back to the first and on again; as we do so, we can reconstitute, in an act of imagination, the four-dimensional circumstance that the image's creator fixed in the image in the first place.[28] So two-dimensional bison on a cave wall are reconstituted into the hunt that was, with all its movements and emotional energy, and just as importantly, serve as a herald announcing a model for all future hunts. As such, traditional images imagine the world.[29] They are prehistoric because they predate writing and linear thought.

Technical images are created by computing zero-dimensional points (e.g. transferring bits of information, such as photons or electrons) onto a surface.[30] Contrary to traditional images, they move from the abstraction of calculated points towards the concrete,[31] to reconstitute what historical consciousness and conceptualizing has reduced to the level of subatomic particles and placed well beyond the reach of human experience. Since the elements

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[25] *Imagens Técnicas,* p. 16.

[26] *Idem,* p. 23.

[27] *Idem*, p. 24-25.

[28] *Filosofia da Caixa Preta*, p. 19-22, *passim.*

[29] *Ibidem.*

[30] *Imagens Técnicas*, p. 16.

[31] *Ibidem.*

joined in the creation of a technical image are "neither palpable, nor visible, nor even conceivable,"[32] they cannot be created as traditional images, e.g. using imagination and tools. It becomes necessary to invent apparatus capable of computing, imagining and displaying what we can no longer experience ourselves.[33] Flusser argues that technical images exist at the same level as reality, and, for this reason, they are neither symbolic nor require interpretation. From this it follows that they are united to the real world by an uninterrupted causal chain: abstract concepts describing, explaining and predicting the world concretized in the image. As such, they are more akin to "windows" onto the world than strictly "images"[34] (which is etymologically connected to 'imagine'). Technical images are successors to written texts: they are post-historical. Instead of imagining the world, they "imagine texts that conceive images that imagine the world."[35]

Apparatus exist to inform. Flusser explains they differ from machines in two important aspects. First, machines exist to perform work: human activities meant to transform the world. They perform work at a higher rate of efficiency than humans could alone or using tools. Apparatus, on the other hand, do not perform work. Their aim is not to transform the world, but to transform human life. Flusser first theorized the apparatus based on the photographic camera, which allowed him to describe its most fundamental feature: the program on which it runs. This is to say that any apparatus's full range of possibilities is constrained by the preexisting program on which it runs.[36] A single-lens reflex camera is a mechanical apparatus laden with buttons and dials whose predetermined program constrains shutter speeds at which movement can be stopped (usually in one-half increments from 8 seconds up to 1/8000 of a second in more professional models); lens apertures which determine depth of field (in a scale which somewhat represents the relation between the diameter of the aperture blades and the optical surface of the lens); both shutter and aperture determine the amount of light (photons) that reach the emulsion (silver grains) which, once developed and enlarged (following another program), produce the printed image.

The gestures involved with the creation of a technical image are twofold. The first step involves creating and programming apparatus. The second involves pressing buttons as instructed by the program. The latter gesture is performed by fingertips. It aims to compute

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[32] *Imagens Técnicas*, p. 28.

[33] *Ibidem*.

[34] *Filosofia da Caixa Preta,* p. 25-28.

[35] *Idem*, p. 25.

[36] *Idem*, 35-40, *passim*.

abstract points on to a surface to create concrete images (from zero to two-dimensions). It aims to inform.[37] Nevertheless, some foreshadowing is in order: I will explain the Flusserian argument, later on, as to why this is rarely the case. Instead of informing, technical images are mostly redundant because the current version of the occidental program is built to entertain, and, while doing so, to entrap people within. In a nutshell: to create informative technical images it becomes necessary to subvert the program. However, this becomes increasingly difficult to do since the more we are entertained by the images we consume the less discontentment we feel, the less we are inclined to seek out new information.

In sum, technical images "project meaning onto surfaces, projections which must become vital projects for their spectators. We are supposed to follow the projects."[38] By reorganizing society around images, they change our relation with the world in a number of ways. They direct our actions to the apparatus and the program. They constrain our agency in accordance with the programmer's intent.[39] Because of this, the consequences of this cultural shift for the study and conduct of strategy and war will have to be thought of. What might post-history reserve for such endeavors?

What follows is a summation of sorts to highlight the crisis that results from the cultural shift into the superficial world of technical images. Signs of this crisis are already upon us. This is one of the more challenging themes in Flusser's work, since it is discussed in differing nuances in all the major texts I have cited in this essay, and, for this reason, I will keep myself to those aspects which I believe are more germane to the discussion surrounding the study and conduct of strategy and war. I will base the following mostly on *Gestures* and *Pós-História*.

A first issue is the changing nature of work[40] and how those changes have led us to lead a life wherein it becomes impossible to ask (or even conceive of) questions of value or finality. Machines, and then apparatus have changed how we view life to the point where it has become irrelevant to either inquire about 'good' or 'true.' The one thing that matters is 'efficient.' And, when methods become more important than politics and science, Flusser explains, "ethics as well as ontology become meaningless discourses, for the questions they raise do not present any methods that would make answers possible."[41] Another issue results

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[37] *Imagens Técnicas,* p. 33-36, *passim*.

[38] *Idem*, p. 75.

[39] See, generally, the discussion on deep reading and e-books, Chapter 1, Section 2.9.

[40] *Gestures,* pp. 23 et seq., *passim*.

[41] *Idem,* p. 13.

from the growing existential impossibility of conceptualizing a world filled with objects whose existence is detached from the human subjects who manipulate (and study) them. Even so, the transcendence between human subjects and the objects they study — the separation between subject and object — lies at the foundation of the scientific method and the gesture of searching. Given our actual experience of being-in-the-world, as we no longer believe this separation to be acceptable a crisis ensues.[42] This crisis is intensified given the fact that the scientific method remains the only significant source of authority in the West (and, what makes an authority in Flusserian terms is the fact that its messages are accepted by consensus and therefore require no executives to dispense it).[43] Finally, as we turn and immerse ourselves more and more in the program we will find ourselves increasingly disconnected from written texts and the historical discourses that have led to fruitful relations with others as we sought to understand and meaningfully transform the world around us. And, as that happens, our decisions and our understanding of the world will be limited by the program and the technical images that reach us. Those images, however, will most likely not bring us new information. A program closed off to the world in which people remain connected to each other but do not dialogue — in other words, create new information — will tend to informational entropy and redundancy.

While I have ordered those aspects in a manner I feel will better assist in presenting Flusser's arguments, it is very important to note that they are intertwined and mutually reinforcing. There is no causality to be inferred from their order. Perhaps they should be thought of as patterns viewed as one turns a kaleidoscope tube. Indeed, if there ever was a reason for discontentment it might lie in recognizing we are less than ideally equipped to talk of these things. Post-history.

In a Flusserian perspective, we work to transform the world we live in. Therefore it places those who work as active drivers of history. In the beginning (e.g. prehistoric times) the ontological, epistemological and deontological aspects of work were intertwined and undistinguishable from each other. The emergence of written texts and historical consciousness progressively led to awareness of these aspects and from then on this "tri-partition" began to unfold as history.[44]

Flusser describes this process in three phases. In antiquity and in the Middle Ages human interests were directed towards the salvation of the soul. Man was the "interesting"

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[42] *Gestures,* p. 155.

[43] *Pós-História,* Ch. 5 "Nossos Saberes", *passim*.

[44] *Gestures*, p. 10.

problem,[45] one whose designs and actions in the world were mediated by temporal and mainly spiritual administrators. Most work was related to the manipulation of nature through agriculture. More importantly, "people work[ed] to realize a value—ethical, political, religious, practical, in short, 'in good faith.' "[46] During the modern phase the emphasis turned towards understanding nature and one's being in the world. While nobility and the clergy would be left to deal with Man and the things Man engaged with, a new class emerged to deal with the newfound interest of the bourgeois revolution: known first as natural philosophers, then as scientists. The administration of life was mostly left to the state, though the Church was still present.[47] In modernity there was no fate, only causality[48]: people worked "epistemologically, scientifically, experimentally, and theoretically, in short, 'without faith.' "[49]

Our present, post-industrial society has important differences if compared to the preceding societies (agrarian/medieval and industrial/modern). Factory workers and farmers are now in the minority. And this changes the way we view the world we live in, because our ontologies depend on the prevailing type of work in any given time. In the age of technical images most people are white collar or service functionaries. Instead of manipulating nature (agrarian) or transforming raw materials by means of machines (industrial), functionaries manipulate symbols either as input of a program or of other functionaries. They may do so manually or by means of programs (e.g. word processors or spreadsheets). In other words, their actions are not directed at the concrete world, but at the codified world: the world of apparatus and programs.[50]

In time, as programs and apparatus become more pervasive, society becomes a technocracy.[51] However, there are two different stages of technocracy in Flusserian thought. The first is a product of bourgeois ideology and industrial societies: it seeks to "turn society into a mass that can be manipulated (into an inanimate object)."[52] This requires viewing society from an ethically neutral standpoint[53] (a possibility which results, of course, from the shift from a finalistic to a causal ontology). This is in line with the more well-known meaning of

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[45] *Idem*, p. 149 *et seq.*

[46] *Gestures*, p. 10.

[47] *Pós-História,* p. 34 *et seq*, *passim.*

[48] *Gestures,* pp. 148-9.

[49] *Idem*, p. 10.

[50] *Pós-História*, pp. 35-37.

[51] *Idem*, pp. 40-41.

[52] *Gestures,* p. 152.

[53] *Ibidem.*

technocracy: a cadre of specialists whose decisions are optimized to their respective specialties. The second obtains in post-industrial societies in which functionaries are likened to cogwheels inside the apparatus which they serve. They differ from farmers and factory owners (and even their managers) both in terms of how they relate to the concrete world and to their significantly diminished agency. In this sense, regardless of the level of their formal education, they are comparable to "serfs and workers,"[54] in an opposition of sorts from what their more traditional meaning takes them to be. Functionaries "emphasize methods; that is, [they] work technically, functionally, efficiently, strategically, and cybernetically, in short, 'in great doubt,' 'in despair.'"[55]

Post-industrial societies are also made up of programmers, who symbolically project programs by devising algorithms that initially dictate the functioning of apparatus and, more importantly, of functionaries. In this game, Man is to be "symbolized… enumerated … cyphers to be inserted into several formal games, for example, statistics for perforated cards."[56]

In these three phases, classical, modern and contemporary, people are, respectively, occupied with questions of purpose, value or finality (for what?); causes (why?); and formality (how?).[57] Thus, in contemporary times, the matter of values has become "nonsensical." This is manifested, for example, in technocracy superseding politics (what is right) and even science (what is true) under the alleged sufficiency of its own efficiency and its alleged ethical neutrality (which is, of course, an absurd proposition). In sum, if there is no asking 'for what,' work — as an existentially fulfilling activity meant to transform the world in accordance with our desires — becomes impossible. We have been reduced to functions of a program.[58]

Scientific discourse substituted questions of purpose for questions of causality (again, *why?*, instead of *what for?*). This led to an accelerated increase of the rate at which human knowledge grew because every discovered cause would lead to other causal questions, *ad infinitum*. However, causal explanations are value-free. They cannot and do not lead to questions of finality. And, according to Flusser, this impoverishes our range of meaning.[59] In contemporary times this was taken one step further: science has abandoned causal for formal questions. Instead of *why?*, the question is now *how?*. To repeat Flusser's example, the question

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[54] *Pós-História,* pp. 38-39.

[55] *Gestures,* pp. 10-11.

[56] *Ibidem.*

[57] *Ibidem.*

[58] *Gestures,* p. 14.

[59] *Pós História,* pp. 46-47.

"*why do men behave this and not that way?*" gives way to "*how do men behave?.*" And this is existentially unsatisfactory because humans are much more interested in knowing so that they may decide and act in the context of their relations.[60] To complicate things even further, as scientific discourse progressively extends itself to other fields of human knowledge, it sterilizes those fields of any value or causality, until it ultimately disqualifies them. In Flusser's own words, "[t]hus science demonstrates that all evaluative knowledge is pseudo-knowledge: ideology. And as it unmasks every extrascientific knowledge to be ideological knowledge, science places itself as the only authority on matters of knowledge today."[61]

This state of things is existentially unacceptable. Science has disqualified other discourses and replaced every other authority. As a result, the more we know the less satisfied we become. We are left groundless.

In *The Gesture of Searching*,[62] Flusser takes a different tack to reach a similar result. Here the gist of the argument follows the separation between 'interesting' and 'not interesting' things, in other words, things Man either directly engages (such as war, politics, disease) or does not engage with (such as celestial objects). Given that Man's relation to the latter is transcendental, that he is not 'involved' with such objects, the 'interesting' things ended up left to extrascientific disciplines while this 'objective' knowledge became the purview and ultimate goal of science. However, as time went by, science expanded to include Man in several of its disciplines, such as economics, psychology, medicine, sociology and, in the subjects directly connected with this essay, war and strategy. That it did so while retaining this unattainable quest for 'objectivity' and leaving any evaluative concerns aside leads us right to the point made in the preceding paragraph.

In our contemporary, post-industrial times science has eschewed evaluative and causal questions and has reached hitherto unimaginable levels of formality and abstraction. Its symbols no longer relate to the concrete world. A solution, says Flusser, is to allow this crisis to be "overcome by phenomenology," so we might "return to the things in themselves."[63]

In the age of technical images actions will no longer be directed at the world, but at images instead. Actions will no longer change the world, they will seek to reprogram those who receive the images. Since our gestures will follow as reactions to images, images will become

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[60] *Pós História,* pp. 46-47.

[61] *Idem*, p. 49.

[62] *Gestures,* pp. 146 *et. seq.*, *passim*.

[63] *Pós-História*, p. 52.

our "partners in the loneliness they have wrought."[64] And this will bring us into circularity, but not exactly as in prehistory. Images will become an endlessly repeatable source of entertainment. Instead of the linearity of historical time, an eternal return to the image: post-history.[65]

The creation and diffusion of images has drawn and will draw from historical discourses (science, art, politics) which resulted from written texts until that proverbial well runs dry. In this stage images also accelerate time, because they ever more quickly precipitate scientific claims, artistic styles, feats of engineering and so on towards something that can be photographed or recorded and "re-codified from discourse into a program."[66] But this is fake history. It results not from actions meant to change the world, but to create more images and program more spectators. Once again, post-history. And, once that well has indeed run dry, when history has run its course and everything has been transcoded into a program, we will have reached a stage of informational entropy, not unlike the heat death of the universe. There will be no information, only redundant images.

The foregoing has a number of important consequences for the discussion of the study and conduct of strategy and war. Post-history in itself is a challenging proposition for a subject that is profoundly historical and embedded in the tradition of the written text. The demise of authority and the undying quest for efficiency disqualifies, with that most damning label of *extrascientific,* any serious discussion based on deontological concerns. This, together with the frightening proposition that all decisions are functions of the program (e.g. the "occidental" program; the "American defense establishment" program, to name two examples), spells a gloomy outlook for responsible leadership and government, capable of making sound decisions that result from a consensus that takes into account an idea of progress (e.g. politics). Is it too late? Recent developments indicate that most gestures in government are indeed addressed at the program, at producing and circulating images, which posits an additional problem for the study and conduct of strategy and war, subjects intimately tied with the materiality of the world and the designs of people based on their political objectives. The following sections will attempt to recast war and strategy in Flusserian terms based on a few examples.

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[64] *Imagens Técnicas*, p. 83.

[65] *Imagens Técnicas*, p. 81.

[66] *Idem,* p. 84.

5.3 INDUSTRIAL WAR

War is fought by human beings. Their attitude to making war is shaped by what they understand, by what they hold dear, by their estimates of success or failure against the cost of fighting, including the cost in lives, their own or of those they love or care about.

Fighting wars on an industrial scale – the likes of which we had not seen until the Second World War and have not seen since – requires an ample measure of social coordination. There is research and development of weapons systems and of the tools to build them. Then there is the technological shift from prototype to factory. More importantly, there are the people involved: in politics and government; in fighting, manufacturing, agriculture, logistics, education; closer to the battle lines or on the home front. Fathers and sons, mothers and daughters, husbands and wives.

While political objectives set the course of the war insofar as strategy and tactics go, men rarely, if ever, fight for a particular resource as an aim unto itself. Their reasons are intimately related to values: hatred of an invader; love of kin, king and country; a better livelihood for them and their loved ones; and, in democratic societies, even freedom.

This is to emphasize the relation between the values a particular polity expresses in its political choices and the materiality of the actions directed at the world to which those values are addressed. This was clearly seen both in the buildup leading to and during the Second World War on each side: Germany and its refusal to accept the humiliations of Versailles; the Soviet Union and the existential desire to protect its territory — *mat' Rossiya*; the United Kingdom, and, finally the United States, as Western powers holding freedom and democracy as values worth fighting for in themselves. These were more than self-serving narratives or propaganda fodder, though they would also come to shape propaganda efforts, with all of the associated lying, smearing of opponents and omissions of truth. They were matched — in blood, sweat, toil and tears — in sum, in work, mobilizing entire countries, expending millions of lives and centuries' worth of economic resources, to materially transform the world so that it might on some level come to reflect what those values expressed.

That they were opposed by other polities with divergent values lies, of course, at the very heart of the matter.

So, to name but one example, tanks, artillery and related combat doctrines were vastly improved, in addition to all that each polity had to offer in terms of mobilization, to the point of allowing fighting with combined arms, because fighting with combined arms or making a concerted effort to make oneself able to fight with combined arms proved decisive in war. That

those efforts sometimes worked (as in the first iterations of *Blitzkrieg* and in US advances towards the end of the war), and, perhaps, mostly failed (as in the case of the Soviet Union during Barbarossa, the US in Italy and the Germans when faced with a war of attrition on the Eastern Front) was besides the point: they were taken as material necessities based on strategic and tactical observations.[67]

What leaders, commanders, troops, in sum, the citizenry understood about the world and their place and actions in it was contingent upon a number of historical discourses: scientific, technological, political, religious.

In the age of the written text this understanding resulted from the linear nature of the gesture of writing, or, in other words, our historical consciousness. This was further expanded when, after the advent of the scientific method, humanity sought to achieve understanding, and later mastery, of nature, beginning with inanimate objects (e.g. celestial mechanics) and following all the way to living beings, the human physiology and psychology, and social interactions.

However, as this quest, both epistemological and ontological, prevailed in culture, and gave rise to the technological, economic and even demographic means that made large-scale, industrial warfare possible, it ended up shifting humanity away from the ability to dialogically conceive of or even experience, as part of their lives, the deontological issues that had once lain at the very forefront of our existence, a trend whose most visible mark is the progressive secularization of Western life.

Much of the success of the allied mobilization and conduct of fighting in the Second World War depended on coordination and mass information. From combat training to manufacturing, driving the war effort's goals and eliciting the expected contribution of each and every citizen demanded uniform expectations and understanding of the world.

And there was more: rousing the fighting spirit in the troops, keeping calm and carrying on on the home front, knowing that it was a price worth paying. This was the domain of propaganda. In this sense propaganda is profoundly discursive, considering that it seeks to establish a particular interpretation of events that reinforces particular values while framing alternative interpretations as ethically undesirable. There is no engagement of opposing worldviews: they are simply shunned.

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[67] For a more complete account of combined arms in the Second World War and during the Cold War, see Chapter 4.

Reinforcing those values had an ultimate aim: causing those affected to perform certain gestures addressed at the world, to transform it. Those gestures were work.

A well-known example of the use of technical images as a mass communication mechanism is Franklin Delano Roosevelt's series of radio broadcasts known as the "Fireside Chats."[68] Differently from speeches addressing the United States Congress (such as the "Day of Infamy" speech), which were made with less consideration to radio listeners than to the US Representatives and Senators, the Fireside Chats were broadcast (and recorded) from the Diplomatic Reception Room of the White House, using mostly informal, colloquial language.[69]

Evidence of the Flusserian program can be initially gleaned from Roosevelt's own intentions and the technical decisions that supported them: by controlling the ambiance of the recording and his rhetorical choices, he sought to mobilize listeners to connect with him as if he were actually there, in each person's living room, talking directly to them.[70] This is a marked difference from speeches broadcast from Congress, which carried the ambience of the chamber and the reactions of those present, and, as such, dislocated listeners both geographically and relationally — placing them as witnesses, external to the conversation and to the event as a whole. That this relational dislocation was not felt in the same manner during Fireside Chats is a feature of the program itself.

While in the address to the joint session of Congress the communicative gesture is directed at those present, in the Fireside Chat the gesture is — in fact, it can only be — directed at the apparatus: the microphone, set at a distance chosen by the producer and adjusted by technicians, the tone of voice, even the dental prosthetic made specifically to fix a slight whistle that had become noticeable while Roosevelt was on the air.[71] Much in the same way, to participate in this conversation, listeners could not direct their gestures at anywhere else but the

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[68] The Fireside Chats were a series of 31 radio addresses that began in 1929, at the height of the Depression, and went on until 1944. They were borne of Roosevelt's desire to communicate directly with the American people while bypassing traditional newspaper press, many of whom were conservative and seen to oppose New Deal policies. One memorable example was the discussion of the policy initiative that would later become known as Lend-Lease in the chat dated December 29, 1940, that would later become known as the "Arsenal for Democracy" speech, an initiative that would prove instrumental in aiding Britain and in changing the non-interventionist stance that had held strong support in the nation. The relational affect between Roosevelt and the American public was already established, as recounted by Goodwin, Doris Kearns. *No ordinary time: Franklin and Eleanor Roosevelt: the home front in World War II*. New York, NY: Simon and Schuster. 1994, p. 102: "as the appointed hour of 9pm approached, theater owners in New York noted a decided drop in attendance: thousands of people who would otherwise have gone to the movies stayed home to listen to the president's speech." In another example, when Roosevelt let it be known that he wanted people to follow the chat along with a map, they became generally hard to find (*Ibidem*). See, generally, Goodwin, *op. cit*, and Craig, Douglas B., *Fireside Politics: Radio and Political Culture in the United States, 1920-1940.* Baltimore, MD: The Johns Hopkins University Press. 2000.

[69] Goodwin, *op. cit.* p. 105 *et seq*.

[70] *Ibidem.*

[71] *Ibidem.*

apparatus that decoded the signals into a sensorially recognizable pattern: pushing and turning buttons on the radio set, perhaps while pulling a chair closer, telling others to be quiet, hoping there was no interference with the signal. And, as they allowed themselves to be raptured by the program, they were led to performing subsequent gestures, now addressed at the world.

In the years leading to the Second World War and until c. 1960 the confluence of commercial interests and regulatory power resulted in a greater proximity between broadcasters and the US Government. This materialized film and radio productions (such as the Fireside Chats) and, in the early years of the Cold War, television programs,[72] whose content and presentation were largely dictated by government priorities and interests. In Flusserian terms, this proximity allowed the government to largely control the program, and, in doing so, to create technical images that would elicit desired gestures regarding morale or mobilization during wartime or galvanizing anti-communist sentiment and limiting dissent afterwards.

By the end of the Cold War neither had the Soviet Union and the United States directly fought each other with conventional weapons nor had the threat of a nuclear engagement come to pass. After decades of preparing for combat the likes of which would not be seen until Desert Storm (notwithstanding the extremely limited means and fighting abilities of the Iraqis), the United States managed, at the same time, to create a large all-volunteer fighting force and stockpiles of then state-of-the-art weapons in Europe[73] while demobilizing their industrial and societal base to the point where it would be virtually impossible to sustain a war effort comparable to the Second World War's if those stockpiles happened to be consumed at a greater than anticipated rate.

This was the nascent age of unconstrained finance, off-shoring and, ultimately, of globalization, an age in which "Made in America" would become a throwback slogan to blue collar former glory, and no country would ever be able to command wartime budgets as in the Second World War again.

In cultural terms, the technological and institutional changes that allowed the massive diffusion of color television sets, in conjunction with the ascendance of corporate ownership of

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[72] See, generally, Bernhard, Nancy E. *U.S. Television News and Cold War Propaganda, 1947-1960*. Cambridge, UK: Cambridge University Press. 1999, pp. 106 *et seq*. The Office of Public Affairs produced Your Foreign Policy for ABC in 1948, the first of a series of TV shows produced for local networks. Directives for airing included "wide distribution ('network or nothing'), ideological control ('treatment in accordance with Department dignity and policy'), and exciting visuals ('cheese cake gal doing three-dimensional displays such as piling up blocks')." They would also produce a number of other shows to garner support for US policies during the Cold War. Additionally, there were instances of direct censorship negative news coverage (e.g. Gen. MacArthur during the Korean War), Cf. Allen, Alyssa. The Change in U.S. Television News Throughout the Cold War. *The Alexandrian* XI(1), 2022.

[73] See Chapter 4.

broadcasters and cable news networks not only increased the quality and reach of technical images but, more importantly, put the control of the programs that made them possible somewhat beyond the reach of successive US governments. And, once this trend was consolidated, the Flusserian program used to create those images would come to serve corporate interests manifested in the most capitalist expression of them all: shareholder profits. To do this, two things were necessary: entertain spectators with successive technical images that showcased American virtues of individuality and endless consumption, and intersperse those images with advertisements which would command increasing revenues for broadcasters.

In this world, and notwithstanding the rise and fall of quality video-centric investigative journalism in and around the late 1960s, news of proxy wars, anti-communist propaganda and war movies were now there for entertainment. Under a steady barrage of technical images, people were no longer driven to work at anything comparable to what the war effort had been about: mobilization against a real existential threat, something that could be seen from the gestures those images elicited. By the 1980s, the freedom that opposed Soviet authoritarianism was the freedom to work their jobs and spend their earnings on consumer items that personified the American way of life.[74] Other than that, most of their remaining gestures were towards the apparatus: adjusting aerials, choosing channels, increasing the volume, allowing themselves, once again, to be raptured by the program.

In summation, a Flusserian account of the conduct of war based on the experiences leading to the Second World War and the Cold War, or, in other words, in an age which captures both the heyday of industrial societies and the shift into the paradigm of apparatus, programs and technical images, reveals a number of relevant issues.

First, as epistemological foreplay, to study technical images is to always begin by asking the question *why the program*? During the societal effort surrounding the Second World War technical images served a number of political goals. By appealing to values such as patriotism, the need to unite behind a worthwhile cause and the untenability of the American non-interventionist stance, the US became, first, the "arsenal of democracy", and, later, the spearhead of the invasion at Normandy. The conduct of war on this unprecedented scale required unprecedented coordination, and apparatus — the radio — and technical images — notably photography and scripted films — had a pivotal role to play. In subsequent decades, as

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[74] It is notable that they did so while still living according to the biological imperative of survival. Indeed, that would continue to be the case until the program started operating against the idea of survival of the species itself. That the program would be able to successfully contradict a biological imperative is a significant, though not unforeseen, development. Sadly, this is a discussion that lies beyond the reach of this essay.

the US government momentarily lost direct or regulatory control of the program, and corporate interests were taken to a whole new level given the diffusion of the color TV, things changed: technical images were now meant to entertain (not to inform). This version of the program fed on anti-communism and American triumphalism to produce more images, to keep spectators within the program, not to drive any material change in the world.

A second issue is the relation between the confines of the program and the external world. Science, technology, politics, ethics somehow informed early technical images given the fact that their ultimate goal was to promote a material change in world, one that would lead to a successful result in the war. In this sense, those technical images were informative. However, other than the acute moments of the Cold War (e.g., the Cuban Missile Crisis, to name one case), many of the technical images were sourced from previous images from within the program, in a closed feedback loop by which a previous image is repeated ever more detached from the circumstances (historical, e.g.) that led to its creation in the first place (Che Guevara t-shirts being a silly example of such phenomena). This was foreseen by Flusser. These images, while entertaining, are redundant and devoid of any information content. They cannot lead to any meaningful dialogue.

This has important repercussions for the future study and conduct of war in post industrial societies, the most important of which is that the more the program operates in a closed feedback loop and entraps our attention the more it will severely limit our ability to produce material change in the world, even through the use of force.

5.4 IN-CONSEQUENCE

"Freedom is the freedom to say two plus two equals four".
From Winston Smith's Diary[75]

"We're an empire now, and when we act, we create our own reality. And while you're studying that reality judiciously, as you will—we'll act again, creating other new realities, which you can study too, and that's how things will sort out. We're history's actors . . . and you, all of you, will be left to just study what we do."
As told by an unnamed source — allegedly Karl Rove — to Ron Suskind.[76]

We are currently witnessing a substantial change in the international system and the geopolitical landscape. Differently from past study and understanding of the momentous changes that happened in the 20th Century, changes which are largely responsible for configuring the world as it is today, the analytical framework and logic developed and, to a point, imposed since the end of the Cold War (and even more so since the 911 attacks in New York City) appear ill-suited to deal with current contextual, logistical, tactical and strategic considerations.

Perhaps the defining contextual feature of our current situation is the return to a multipolar international order, the likes of which had not been seen since the 19th Century. Back then, however, history was in full swing: the deciphering of the inanimate world through science and the promise that Man himself would eventually be explained scientifically; the wedding of science and technology and the rise of modern industry; improved health and education of the citizenry accompanied by an increase in population levels, and, perhaps most important of them all, an idea of inevitable progress, all of which helped materialize the scale and scope that would allow sufficiently developed polities to project power from afar and wage industrial war.

That these possibilities were explored in accordance with each polity's interests, even when resisted by others, lies at the heart of the matter. Nonetheless, it is important to emphasize that those interests, as well as the gestures associated with their protection, lay in and were addressed at the world, whether securing trade routes, access to raw materials or the protection of sovereign territory. Furthermore, those gestures were deontologically informed by values held by each polity — a particular version of the world that they would strive to materialize under constraints —, even if doing so required the use of force.

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[75] Orwell, George. *1984*. London: Penguin Books. 1977 (originally published 1949). Cf. Winston's interrogation by O'Brien, p. 206.

[76] Suskind, Ron. *Faith, Certainty and the Presidency of George W. Bush*. NY Times Magazine, Oct. 17, 2004. Available at https://archive.org/details/faith-certainty-and-the-presidency-of-george-w.-bush-the-new-york-times/page/n3/mode/2up, accessed on May 8, 2023.

The aftermath of the Second World War saw technological and cultural changes that ushered in a world of technical images and their supporting apparatus and programs. This was paralleled by the beginning and end of the Cold War and all the crises and proxy wars that pitted the Americans against the Soviets between the 1950s and the 1980s. Further, there was also the shift, in the developed West, to a post-industrial society. In it, finance and other services would come to the fore, most manufacturing would be shipped to other countries and globalized trade would become an economic symbol of American unipolarity.

In Flusserian terms, this telematic, post-industrial US society ran (and runs) on a number of programs. At the highest level it can be said there is both a 'national defense' program (War) and a 'post-industrial capitalistic' program (Trade), though attempting to describe the first is of greater interest here. Furthermore, if Flusser's thought holds sway, we should be able to observe a very important characteristic of telematic societies: the more they operate within the program the less connected to the material world they become.

I would submit that the US "War" program has a kernel much in the same sense as an operating system does: not only is the kernel generally in complete control over everything else in the program but, more importantly, it runs protected from access by any of the remaining parts of the program, *even those that might check its validity against the material world*.

In regards to fighting actual wars, this kernel results from beliefs largely created as a consequence of the Civil War and the Second World War. They were amplified by American exceptionalism and resulted in a worldview that could only accept offensive wars, fought until the opponent was annihilated. This came to be even though in the Civil War neither side was fighting a war of annihilation (and certainly not an industrial war), and in the second the thrust of American engagement in Europe was either in theaters not key to defeating the Axis forces (Italy, Africa) and, after the invasion of Europe proper, was in opposition to Axis forces already severely weakened and depleted by the unprecedented destruction they had faced on the Eastern front.[77] In either case, war was a noble endeavor, in which deeds of valor and sacrifice came to pass, and, when they had to be fought, they involved the whole nation.[78] Since the Second World War these beliefs were reinforced by technological promises[79] of airpower and advanced

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[77] Lewis, Adrian R. The American Culture of War in the Age of Artificial Limited War. In: Lee, Wayne E. (Ed.) *Warfare and Culture in World History*, 2nd Ed. New York: New York University Press. 2020. pp. 289-334; Martyanov, Andrei. *Losing Military Supremacy: the Myopia of American Strategic Planning*. Atlanta, GA: Clarity Press Inc. 2018, Ch. 3 "The Many Misinterpretations of World War II", *passim*.

[78] Lewis, A., *op. cit.,* pp. 291 *et seq.*

[79] Cf. Proença Jr., Domício. Promessa Tecnológica e Vantagem Combatente. *Revista Brasileira de Política Internacional* 54(2), pp. 173-188, 2011. As stated in the article's proem: "Pautar prioridades de defesa por metas

technologies — including nuclear weapons — that would not only supersede previous doctrines (e.g. a supposed revolution in military affairs) but would also mitigate the need for sacrificing so much of its citizenry while those back home enjoyed the life afforded by the unparalleled economic growth of postwar years.[80] For these and other reasons — one of which is never having faced a true existential threat against its own territory —, Americans found protracted wars of attrition anathema.[81]

As events unfolded during, and, more importantly, after the Cold War these beliefs were sorely tested, though they appeared to have pulled through largely unscathed. Americans became involved in a number of conflicts in keeping with its expanded role in world affairs which they purposefully did not classify as "wars." And, when they did fight wars, such as in Vietnam and later in Iraq and Afghanistan, they found out that the new technologies could support — to a point — but never actually substitute 'boots on the ground,' in spite of their opponents' technological backwardness. That their soldiers were often ill-equipped, to the point where people back home brought it upon themselves to purchase and provide body armor to their loved ones, that their sophisticated equipment was continually thwarted by 20-dollar explosive devices and that the only way enough troops could be mustered was by unilateral extension of tours of duty, the incorporation of national guardsmen originally tasked as reserves not for overseas deployment (especially not in the absence of a legally established state of war) and the hiring of private military companies was, from the perspective of the program, simply noise, something to be tuned out.

Perhaps the greatest evidence of the disconnect between the technical images that program peoples' behavior and reality is regarding the question of the US's ability to actually project military power. One salient example is the *carrier group* and its known[82] though always downplayed vulnerability against missiles.[83] That such an attack has yet to occur has fed countless images of the carrier group as an invincible and unsurpassed achievement of US

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tecnológicas arrisca perder de vista a integridade do processo pelo qual se busca, produz e aproveita algum resultado tecnológico para produzir capacidade combatente; pelo qual se concebe, propõe e escolhe alternativas de capacidade combatente para compor arranjos de defesa…"

[80] Lewis, A., *op. cit.,* pp. 291 *et seq.*

[81] *Ibidem.*

[82] Cf. Martyanov, A. *Losing Military Supremacy: the Myopia of American Strategic Planning.* 2018, Ch. 6 "Threat Inflation, Ideological Capture and Doctrinal Policy Questions", *passim*, for a review of Admiral Elmo Zumwalt's, US Navy Chief of Naval Operations from 1970-1974, concerns regarding the vulnerability of a carrier-centric naval force (as opposed to then-Soviet capability built around missile technology).

[83] A threat highly exacerbated due to hypersonic missiles, Cf. Grau, Lester W. and Bartles, Charles K. *The Russian Way of War: Force Structure, Tactics and Modernization of Russian Ground Forces.* Fort Leavenworth, KS: Foreign Military Studies Office. 2016.

technological, industrial and military prowess. In this sense they are most similar to Oceania's mythical "Floating Fortresses" in George Orwell's *1984*: the importance of their existence as technical images — programming people's behavior, including those who might come to assess its meaning as an actual military threat — surpasses their importance as machines.[84] Other examples include the US's current levels of de-industrialization, which cannot be further ignored after the depletion of stockpiles put together over decades in a little over a year in the attempt to supply Ukraine, of technological choices that drive doctrine (instead of the other way around) and of the size and readiness of its troops.

In earlier versions of the program this kernel was counterbalanced by deontological and critical concerns materialized in the consensus seeking politics of the day and by policy planners who were still mindful of real constraints. Perhaps Franklin Delano Roosevelt's presidencies spanning across the New Deal and the Second World War, and Winston Churchill's political rise and premiership from the First World War onwards were examples of this balance in action in the West: on the one hand an idea of progress (whatever one might make of it), and, on the other, the work that would bring it to fruition.

In a sidebar of sorts, while there was certainly propaganda, and even more so during wartime, it is worthwhile mentioning that its dissemination followed the logic of written texts, whether in newspapers, on radio programs or even in moving pictures (the latter two being based on scripted narratives). Furthermore, agreeing (or disagreeing) with propaganda is in itself a historical action: it requires identification with a worldview that is, at the very least, deontologically informed, and, in industrial societies, subject to the perceived impact of historical circumstances. In this sense propaganda's effect is not dissimilar to a manifesto's: it seeks to mobilize and ultimately calls for *work*. For this very reason it is really not surprising that Nazi propaganda held very little sway with the average Englishman: in a jest, *they were just too English for it*. Listening to the BBC in Nazi Germany was an offense; in contrast, in England, Radio Berlin programming was something to laugh at with your mates while having a pint at the local pub. While technical images also elicit changes in human behavior (much like propaganda), the similarities end there: there is no sense of history to draw upon beyond the

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[84] Of course, as one observer has put it, aircraft carriers are "floating barrels of pork" — the insistence with this naval doctrine and their continued existence owes much to Naval, Naval Aviation and shipyards' interests, but the point is that even those interests are part of the program and do not contradict its instructions.

Cf. Orwell, *1984*, p. 157. In Emmanuel Goldstein's memorable "The Theory and Practice of Oligarchical Collectivism" one can find a fitting description the significance of a Floating Fortress: "A Floating Fortress, for example, has locked up in it the labour that would build several hundred cargo-ships. Ultimately it is scrapped as obsolete, never having brought any material benefit to anybody, and with further enormous labours another Floating Fortress is built."

significance of the image itself; if successful, they elicit gestures addressed at the program (not at the world), and it is the program they intend to perpetuate: not a polity, or even a worldview.

Following the Flusserian thread, the shift to a post-industrial society is accompanied by a shift in the nature of work. Instead of the manipulation of the concrete world involved in transforming raw materials through machines and the associated technological and managerial work, we find functionaries who manipulate symbols as inputs of a program (or of other functionaries) as dictated by algorithms (e.g. rules) projected by programmers. Functionaries of the War program are and have been morphing into a technocracy.[85] They have been operating according to rules above and beyond the reach of judicial review and international law, in a bid to manipulate and conform human behavior *directed at the program itself*. That they do so in apparent disregard both for material constraints and political considerations should be taken as a further symptom of the program. And this leads to two final points for reflection which conclude this section.

The first is regarding the increasing contradictions in the Westphalian system of International Law and its current degeneration into a so-called 'rules based order.' From a Flusserian standpoint I argue that the difference between one and the other holds a parallel with the differences between propaganda and technical images.

While there is no clear definition of what a 'rules-based order' is, it is usually meant to describe rules resulting from diplomacy and a balance of power[86] which includes Western multilateral organizations that came to be in the aftermath of the Second World War. Those who advocate for it do so in the most cavalier fashion, ignoring both the binding and the legitimizing aspects that every legal system aspires to effect. This is why it is neither wrong nor overtly cynical to state that the rules-based order is nothing more than a tool to compel others to bend to the US's will.[87]

A rules-based order is incompatible with the idea of law, even of international law. The legal argument is, of course, that law is supposed to be known, binding, and, in the case of international law, its legitimacy lies in its contractual nature. International law is a product of consensus. There is negotiation, agreement — a meeting of the sovereign minds involved —, and ratification, at which point one is supposed to be bound to whatever was ratified. This was

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[85] Cf. the previous section.

[86] See, for example, Tamaki, Nobuhiko. Japan's quest for a rules-based international order: the Japan-US alliance and the decline of US liberal hegemony. *Contemporary Politics*, 26(4), 384-401, DOI: 10.1080/13569775.2020.1777041.

[87] Martyanov, Andrei. *Disintegration: Indicators of the Coming American Collapse.* Atlanta, GA: Clarity Press. 2021. Cf. Ch. 7, "Losing the Arms Race" *passim*.

altogether true of the Westphalian legal order. Finally, in the Western tradition law does (or perhaps, did) so much more than serve as a conflict resolution mechanism. It renders actions — including state actions — legal, just and therefore legitimate, or not.

In Flusserian terms, however, the differences are even more remarkable. The several different ontologies that produced the rule of law (both English and American), *l'état de droit* and the *Rechsstaat*, were, first and foremost, a product of critical thinking and written texts, whose concern with justice and what was right vivified questions asked since the days of the Old Testament and Homeric poetry. To keep a very long story short, justice would be sought in the idea of equality before the law and by means of an operating procedure that was both dialogical and discursive: due process. It was dialogical while opposing parties vigorously engaged in the production of new information (e.g. about the facts of the case, and how those facts related to the law as it stood); then, once this dialogue concluded, the adjudicator passed the ruling which was, of course, discursive, meant to be followed to the letter and further disseminated (and incorporated) as part of the edifice of legal doctrine. While the law obviously sought to modify human behavior, it was related to human behavior in the world — there could be no *Söllen* in the absence of a *Sein*.

In the case of International Law, this meant that sovereign nations bound themselves to act in the world in accordance with certain deontological principles, subjecting themselves to sanctions in case they failed to do so. That one had rights in face of the others. Rights that could be enforced (though this would always be tricky when it came to disputes among nations).

The many failures of the Westphalian system of International Law during the age of industrial, historical societies were not related to the failure of the rule of law as a social construct. In Flusserian terms, the industrial age accelerated progress to the point where warfare became something completely different from what the 17th Century Westphalian legal framework had been thought of to deal with.[88] As much as European nations had gone to war against each other, they had also faced intense internal transformations in a series of revolutions since feudal times, religious or not, which affected the socially accepted — and legally construed — ideas of justice, even after those legal systems were disembedded from the Church and stood on secular ground.[89] Those revolutions were not only historical in the sense that they

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[88] Diniz, Eugênio and Proença Jr, Domício. The collapse of the material foundations of Westphalian International Law. *Revista de Sociologia e Política* 23(54), July 2015. DOI: 10.1590/1678-987315235402.

[89] Berman, Harold J. *Law and Revolution: The Formation of the Western Legal Tradition, V. 1*. Cambridge, MA: Harvard University Press. 1983.

materially transformed the world around them, they also held a strong deontological component.

In this sense a 'rule', as in 'rules-based order', is almost the opposite of a right. While both seek to conform human behavior, only the latter is a deontological product of history. If International Law is the critical product of written texts, in post-industrial societies these so-called rules are not exactly the mere expression of *realpolitiks*, because in the end they do not seek to elicit world-affecting changes in behavior. They are algorithms which invite gestures directed at the program. This can be shown if one, once again, looks at the consequences: are they directed at the world or at the program? How did the recent rounds of US-led sanctions against Russia play in Western media and in actual Russian reality? And what was the American reaction after their failure to bend Russia to their will?

I would argue that the current demise of International Law results, unfortunately, from much more than the inadequacies of the Westphalian framework to deal with the accelerated and massive scale of industrial warfare and the proliferation of non-state actors. In all truthfulness, there is little need for rule of law-type mechanisms in the current iteration of Western social apparatus. Their dialogical element brings unpredictability into the system. They are deontologically oriented. Algorithms are simpler because the only question asked of them is one of efficiency. I leave it to the reader to reflect as to whether there would be a need for the Nuremberg tribunal in post-industrial societies.

The second point is in regards to leaders and what role might be reserved for them as we shift into post-industrial, telematic societies. At a first glance it would appear that both theory and observation show neither need nor promise for the leaders styled on examples of yore. To begin with, they are inevitably historical figures. They deal in the "interesting" problems that the bourgeois revolution left to the purview of clergy and the nobility so they could follow their interest in inanimate objects. They express an ethically constructed vision of the future. They are capable of coordinating work on large scales. In sum, they occupy themselves with changing the world.

In telematic societies what passes for leaders will signify nothing more than elevated functionaries.

I believe a simple comparison suffices as an example. If one takes both the "Day of Infamy" (Franklin Delano Roosevelt, delivered in a joint session of Congress on December 8, 1941) and the "Mr. Gorbachev, tear down this wall" (Ronald Reagan, delivered in a televised appearance near the Brandenburg Gate, in Berlin, on June 12, 1987) speeches from a Flusserian standpoint it is relatively easy to show that one is historical and the other is the script for a

technical image. The first led to a swift declaration of war on Japan, and was a culmination in Roosevelt's quest to change the non-interventionist stance that had been popular in the US prior to Pearl Harbor. This was matched by war bonds, the entire reorganization of American industry in line with the war effort, the draft and many other measures. The second generated a technical image with no direct real world consequence other than solidifying the grasp of both War and Trade programs on those subjected to it,[90] unless, of course, one is willing to assume that it actually brought about the downfall of the Soviet Union on the dramatic powers of the actor-president alone. Other than engaging, entertaining, cajoling those within reach of the television set, it had no real-world consequence. There was no declaration of war (or suing for peace). No ramp-up of industrial production or social mobilization of any sort. No summit of other leaders to coordinate an actual response. It just made for great television.

The finer point here is that even the leader acts as determined by the program. It was immaterial that the US had had a string of military mishaps the greatest of which was Vietnam. It was likewise immaterial that de-industrialization (with the parallel ascension of white-collar financial, and later information technology services), the shifting to an all-volunteer force, and countless other organizational changes to its military establishment eventually hampered US ability to project power, even though the stockpiles put together during the Cold War would last for decades to come. What mattered was that the programs that ran this post-industrial US society would keep functioning and that everyone would remain as functions of the program. I leave it to the reader to reflect on successive US presidencies, State Department policies and military leadership actions since the early 2000s under this Flusserian light, with one issue in mind: what actions were actually aimed at changing the world, and what were aimed at keeping everyone else engaged with the program. Post-history, indeed.

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[90] Including, sadly, academic ouvertures to an alleged "end of history", in a very different — and less sensical — vein from the one argued by Flusser.

5.5 IN-CONCLUSION

All conquerors are lovers of peace until we take up arms against them
Clausewitz, On War.

That is, after all, the essence of dialogue: the participant becomes the other of the other,
himself changing by changing another.
Script: Does Writing have a Future? p. 41

In war, only gestures matter. Before, during and after actual combat. The correlation of political aims and the means to reach them through the use of force is the domain of strategy. This includes many gestures, two of which are *to study strategy* and *to conduct strategy*. At least, we have always known – and prided ourselves on knowing – this to be the case.

In industrial societies, to strategize is (and has been) to look backwards and forwards in time while noting where one stands in the present. As any gesture, it requires intention, and thus expresses some level of freedom. This freedom can be easily correlated with the expression of chosen political aims, but matters begin to become more difficult when we take into account that these aims must be supported by material conditions, because those gestures were originally conceived to be addressed at the world.

Much like the gesture of searching (from which many other gestures result), the gesture of studying strategy (and geopolitics) has required, until now, looking to the past to seek, document and further articulate causal chains as a linear expression of facts in time. The exercise is one of identifying certain alternatives in light of the outcomes they obtain, estimating possible uses of force and their material and psychological requirements. This gesture is in preparation of another, more consequent gesture: the conduct of strategy in an actual situation, with all of its ethical, material and methodological consequences.

Both these gestures, studying and conducting strategy, stand back to back much like two-faced Janus, and this serves as an apt description of the climate that once surrounded them: bridging past, present and expected future amidst uncertainty and complexity, while under the mutual influences of reason, passion and chance.

As any other field, the study of strategy was beset by a series of epistemological issues. For instance, it would not be uncommon for certain authors to fail to reconcile the multi-determinate nature of causes, consequences and even of the communicative choices in organizing both one and the other in a cogent narrative.[91] Or it might happen that one would

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[91] Cf. Schroeder, Paul W. World War I as Galloping Gertie: A Reply to Joachim Remak. *The Journal of Modern History,* 44(3), Sep. 1972, 319-345. http://www.jstor.org/stable/1876415.

interpret past events without an appreciation of the contexts in which they occurred, or, in another word, chronocentrically.[92]

These issues make good examples because they are characteristic of the epistemology of industrial societies. For one reason, they are historical. That is to say they result from the (poor) application of linear, causal, logical thinking that could only have come about as a product of written texts. Moreover, even if uncorrected, they led to gestures which, once materialized, would be addressed at the world, however dire the consequences of the errors may be. Finally, and most importantly, these errors would lead to academic debate from which new theoretical perspectives could dialogically emerge once confronted with new data or new thinking.

I pointed those issues because I believe that as we shift further and further into the world of technical images our epistemological ground will shift likewise. What kind of questions might we then come to ask?

I will indicate some possible questions as an invitation for further dialogue. Once again, they are proposed in no particular order, and should perhaps be viewed as kaleidoscope images as I proposed earlier. They are followed by brief comments which by no means attempt to answer them.

How can we study strategy in a truly post-historical world?

Of course, apparatus and their supporting programs have not severed all our connections with the material world. Does this mean that the study and conduct of strategy continues as before until it simply lurches to a stop (or, more likely, fades into nothingness)? Which appears to lead us to another question:

Since we are ever more connected to programs and apparatus, how will we react when our senses (i.e. what we observe in the actual world) contradict the images the program feeds us?

The current conflict in Ukraine has revealed difficult geopolitical realities for the United States; however, in a trend that started following the 911 attacks in NYC, those voices are tuned out as "unpatriotic" or as Russian (or Chinese) propaganda; in other words, they are discursively tuned out as noise. This has had a negative effect on research funding and the general quality of most mainstream academic work since. Which also takes us to another question:

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[92] Cf. Rock, Paul. Chronocentrism and British Criminology. *The British Journal of Sociology* 56(3), 2005, 473-491.

If the program connects us to one another, and if it is set to ignore new information as noise, how can the study of strategy (or of anything that contradicts the program) keep progressing?

Flusser himself left his generally pessimistic outlook aside when discussing this topic. According to him, in a post-industrial society we can behave as players who discover ways to subvert the program in its dialogue-suppressing routine. And, when (and as) we do so, we will find other like-minded players with whom we will connect and establish dialogues (e.g. produce new information).[93]

What does this mean for a multipolar world?

This, perhaps, is the hardest question of them all. Two factors come to mind, however. The first is that, as far as we can tell, Russia has purposefully chosen a path that has kept it functioning as an industrial society and has largely severed itself (prior to having been spectacularly severed) from Western-style programs. The ontological, deontological and epistemological consequences of this situation cannot be downplayed and must be accounted for if new interfaces are to be proposed and programmed. The second is that neither Russia nor China appear set to be engulfed by Western-style programs (to begin with, they are insulated by language and their corresponding social apparatus and programs appear to have conspicuously avoided any serious interoperability). So, once more the issue of interfaces comes to light. Will the UN be substituted by a summit of programmers responsible for jointly codifying this new interface? If so, under what idea of "progress" would they operate?

In the beginning of this essay I mentioned several causes for discontentment, one of which would be its in-conclusion. I know it is most un-academic to end a supposedly academic text on questions which do not exactly make a research agenda. To make matters worse, the comments following the questions above, especially the last one, appear to intimate a level of ethical concerns that is not in line with how Flusser describes post-industrial societies.

And this brings me back to the realization that in spite of the shift into technical images and post-industrial societies, we have not yet extricated ourselves from linear thinking and written texts, and all that goes with it. Post-history, but not just yet.

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[93] Cf. *Imagens Técnicas*, Ch. 9.

6. CONCLUSION

6.1 POST-SCRIPT

This doctoral dissertation collected three published articles and an unpublished essay. The articles offered original contributions on the significance of the pervasiveness of e-books to the gesture of deep reading (or reading for understanding) (Ch. 2); the analysis of the then-current Brazilian defense strategy as per official documents, highlighting its tensions regarding desires and possibilities; hopes and constraints; and the conflicting demands of security and developments in a developing country, a country whose security footprint in the 20th Century was largely inconsequential, at least as far as establishing a presence on the world stage goes (Ch. 3); the constraints and material conditions by which the US and the USSR/Russia developed the ability to fight industrial wars using combined arms (Ch. 4) and, finally, what the shift into a post-industrial, telematic society might mean for the study and conduct of strategy and geopolitics as the world returns to multipolarity, a configuration unseen since the 19th Century (Ch. 5).

For many purposes we still live in the industrial age. We are surrounded by machines and workers who use them, though they may be in far flung countries. We haven't really abandoned written texts, though they aren't as prevalent in our life as they once were. But we are also becoming increasingly entrapped in post-industrial apparatus, programs and technical images. While this shift will probably take longer in more backward, less central regions, it is nevertheless upon us.

Perhaps the most momentous consequence of the shift into post-industrial societies for a post-graduation in engineering is two-fold. First, if engineering is (and is to remain) the province of transforming the world (e.g., by solving a problem) to somehow suit a human need, the progressive loss of touch with deontology has left us all at the mercy of efficiency, and, in projectual terms, the lack of a common finalistic ground from which to derive an idea of 'better' (cf. Silva e Proença Jr, 2015). If Flusser is to be believed, this does not result from a 'next stage' in capitalism (e.g., a 'victory' of corporate interests), but, rather, from a wider cultural transformation that has progressively eschewed finality, first for causality, then for efficiency. What will be left of engineering (or any other field of intervention, such as public policy planning and implementation) if its sole purpose is to increase efficiency? The second is regarding the future of engineering beyond the programming of apparatus. The further societies have shifted into post-history, the less gestures addressed at the world will be required (or even desired) from us. What can this mean for engineers and engineering?

Of course, this appears to be the province of science fiction, or at least a concern best left to a far-off future. But that future is upon us: there already are programs capable of automatically producing linear texts with minimal human input; of creating images that not only eschew but largely contradict reality; of occupying our attention beyond the actual, material world (and our relations in it). In a most Flusserian vein, the better we are able to establish dialogical relations to discuss these and other matters of import, the better off we are likely to be.

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Chapter 5

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Conclusion

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