Kriegsspiel dice: Why there is no luck in wargaming and why all wargames are simulations

Jan Heinemann

https://orcid.org/0009-0001-3131-6679

Historian and political scientist, concluded post-graduate studies at the Gottfried Wilhelm Leibniz Universität, Hannover, Germany, with a Master of Arts in History in 2019. His scientific areas of expertise include political philosophy, theories of history, social acceleration, cultural and military history of Early Modern Europe and Ancient Greece, as well as historical game studies. He is a staff member at the International Kriegsspiel Society, a certified Master Umpire since 2021 and Admin Professional Wargaming and Europe for the organization. He holds the MORS Certificate in Wargaming since January 2024. As a freelance historical consultant, wargame designer and facilitator he works in PME, for COTS games and in historical-political education. He is also a co-editor of the EuroWarGames volume on the past, present and future of wargaming in Europe, scheduled for September 2024, and currently forming Fight Club Germany.

Email: jan@kriegsspiel.org

101

Abstract: Exactly 200 years ago, professional military wargaming emerged, when Kriegsspiel was introduced in the Prussian army as an officer training tool in 1824. From its very beginning it included dice as a means to simulate uncertainty on the battlefield. Following the arguments of Kriegsspiel designers and Clausewitz' concept of friction, the article shows that uncertainty and contingency are at the core of modern wargaming ever since its invention and argue with Huizinga and Luhmann that all games as systems of contingency ultimately must be understood as simulations.

Keywords: Chance, Clausewitz, contingency, course of action wargaming, double-blind, fog of war, Kriegsspiel, luck, modelling and simulation, probability, Reisswitz, simulation, wargaming.

1. INTRODUCTION

"This is not a game! It is a school for war!", exclaimed Lieutenant-General von Müffling, Chief of the General Staff of the Prussian Army, when Georg von Reisswitz Jr. presented his Kriegsspiel in 1824, which was soon implemented as a mandatory officer training tool. The system had radically improved from his father's Kriegsspiel-Apparatus and nothing in common with all the earlier strategic chess adaptations that were published under the same name. Reisswitz found them all to be flawed and insufficient in portraying warfare appropriately (1824, pp. vii-ix). By introducing intricate rules for tactical combat on highly detailed topographical maps and multi-blind facilitation by an umpire team, he emphasized what is commonly understood as fog of war and command friction and created modern wargaming. Another core element, which would soon be challenged by his contemporaries and those adapting his system during the 19th century, was the usage of dice to adjudicate combat and unit behavior.

Associated with dice are the concepts of luck and chance, terms which can be found in the theory of war and in the discourse around games and simulations and their respective educational or analytical value. This creates an issue the professional wargaming community keeps running into, every time the question is raised what is to be considered a wargame and what is not, as it has not yet managed to distill a specific set of wargaming terms in order to make its arguments more precise (Simpson, 2015, p. 1, pp. 35-36). Starting with dice as a fundamental mechanism of modern wargaming rooted in its very origin story, I will thus argue from a humanities perspective, following Huizinga and Luhmann, that all wargames are ultimately simulations and that there is no luck involved, neither in war, nor in wargaming, other than in the perception of those who are forced to endure its consequences.

2. THE UNCERTAINTY OF REALITY

A brief history of dice in Kriegsspiel

In 1824, Premier-Lieutenant of the guard artillery, Georg von Reisswitz Jr., published his *"Anleitung zur Darstellung militairischer Manöver mit dem Apparat des Kriegs-Spieles"* [Instructions for the depiction of military maneuvers with the apparatus of the war-game]. His rules comprised of a tactical combat simulation with intricate rules for maneuvering half-battalions, squadrons, half-batteries and skirmishers on highly detailed 1:8000 topographical maps to be adjudicated in

two-minute intervals by umpires (white cell). The opposing teams would be called into the room alternatingly and be shown those parts of the battlefield they could see from their command post or had received notice of from their subordinate units or their team's other commanders. Most importantly, members of the same team were not allowed to communicate other than through written dispatches which would be delivered by the umpires after the appropriate delay depending on the distance a courier would have to traverse.

Reisswitz also introduced a set of dice, specifically designed for the game, the faces of which would be cut from a sheet of paper and glued onto six-sided wooden dice. There would be a total of five dice. To determine close combat casualties and morale results, they were based on numerical force ratio, Die I for a ratio of 1:1, providing a 50% chance for either side to win, Die II for 3:2, Die III for 2:1, Die IV for 3:1 and Die V for 4:1. The ratio was determined for the advantaged unit, providing the respective die to potentially pick, which was then modified by rules taking the specific situation, terrain and types of units into account, before eventually rolling the specific die that had been determined by this procedure (i.e. a unit might have the numerical advantage to roll Die IV, but the situation modifies it to three dice worse, causing it to only roll Die I). The morale effect would force the target to either repulse *(Rückzug)*, disorderly retreat *(Geschlagen)* or rout *(Total geschlagen)* and cause the unit to move away from the enemy, as well as preventing it from defending itself and attacking the enemy for a certain amount of time. Additionally, Die I and II would provide results for small arms fire with muskets and rifles at different ranges and good or bad effect for close and open order infantry respectively; Die III and V would provide results for the artillery at different ranges for good and bad fields of fire respectively. Although often accredited to Charles S. Roberts and his 1952 version of the board game Tactics (Lowood, 2016, p. 85), combat results tables were first introduced in 1824 in the Prussian Kriegsspiel.

Reisswitz provides reasons as to why it is paramount to use dice in Kriegsspiel: a) the effectiveness and behavior of units drastically varies in combat due to *"größere oder mindere Gemüthsbewegung sowie die Fehler bei Abschätzung der Distancen"* [bigger or smaller emotions as well as mistaken estimates of distances] (p. 8), b) if there was no variety in combat results in similar situations, players would mathematically determine the best approach which would then negate the necessity to exploit reserves, resulting in an "unnatural" calculation exercise, rather than a realistic combat simulation, corrupting the whole purpose of the game (p. 9). *"Nur mit Wahrscheinlichkeit, niemals mit Gewißheit läßt sich der*

Erfolg übersehen, und der kluge Befehlshaber wird sich daher, wo die Umstände es nur irgend erlauben, für den günstigen und ungünstigen Ausgang vorbereiten" [Only with probability, never with certainty success can be predicted, and the smart commander will thus, where circumstances allow, prepare himself for favorable and unfavorable outcomes] (pp. 12-13). It is worth noting, that Reisswitz adapts the use of dice for these purposes from Opiz' Kriegsspiel (Wintjes, 2022, pp. 33-34), which used two six-sided dice to determine losses based on the numerical result of the dice roll and to decide certain outcomes based on odd or even results. Opiz had already argued that dice made the wargame distinct from chess: "eben so wie es im Kriege nicht blos auf Muth und Vernunft, Herz und Geist des Feldherren, sondern auch auf so manch anderes, das man Glück oder Zufall nennen kann, ankömmt" [as well as in war not everything is determined by courage, reason, heart and mind of the commander, but also much else, which one could call luck or chance] (1806, p. 43).

In 1826 a group of officers reworked the second half of Reisswitz' rules and especially the horrendously high casualty rates by fire, which he had based on the results of Scharnhorst's tests on the shooting range published in 1813. After playtesting, the committee around Karl von Decker and August von Witzleben published their Supplement in 1828. It introduced a sixth die for a strength ratio of 1:5 and incorporated the artillery dice into the melee and morale dice, hence Die I and II would include results for howitzers, III and IV for 6-pounders and V and VI for 12-pounders, a 7th die included tables for good and bad fields of fire for infantry weapons.

In 1846, the Berlin Kriegsspiel society published a new iteration, as both Reisswitz' and the Supplement rules were no longer readily available, and using the Supplement's system of dice, besides applying minor changes, increased the effect of infantry fire again. Most importantly, they replaced the complicated combat results tables on the faces of different dice with tables for die selection (force ratio), close combat and morale results and artillery, namely 6- and 12-pounders and 7-pounder howitzers for good, mediocre and bad effect, all to be used with a common six-sided die. Wilhelm von Tschischwitz published his "Anleitung zum Kriegsspiel" [Instructions for the wargame] in 1862 and updated versions in 1867, 1870 and 1874, creating arguably the most streamlined and solid variant of the classical detachment-level Kriegsspiel, adopting the use of a common six-sided die to be used with a sheet containing the die selection table, the morale and close combat decision table and a fire table for infantry, 4-pounders and 6-pounders at different ranges and good or bad fields of fire. It was due to its

104

FIGURE I

Kriegsspiel Supplement published in 1828 with dice faces.

Source: https://we.tl/t-qPxwz7gK24

streamlined character and the Prussian military successes in 1866 and 1870/71 that Kriegsspiel was internationally implemented in almost all major militaries (Wintjes, 2022, pp. 46-50).

Publishing another variant at the same time, Thilo von Trotha emphasized that the main purpose of the game would be the cognitive exercise, rather than exploiting the dice in a mathematical sense (1870, p. vi). He furthermore continues Reisswitz' argument, stating that *"Dennoch aber muß die Möglichkeit gestattet sein, daß eine solche Truppe, die erschüttert oder überrascht ist, über eine frischere oder ganz intakte siegen könne, wie es ja auch in der Wirklichkeit vorkommt. Diese Möglichkeit gestattet der Würfel"*[Nonetheless there must be the potential that such a unit, which is disrupted or surprised, may win against

a fresher or completely intact unit, as is the case in reality. This possibility is granted by the die] (1870, p. 17).

Jakob von Meckel's "Studien über das Kriegsspiel" [Studies on the wargame] marked a shift regarding the scope and scale of Kriegsspiel, arguing to complement the "Regiments-Kriegsspiel" (tactical level) with the "große Kriegsspiel" (grand tactical level) and "strategische Kriegsspiel" (operational level) (1873, pp. 41-45) and vouching to make it more accessible and mandatorily

FIGURE 2

Results table published in 1870 by Wilhelm von Tschischwitz

Source: https://we.tl/t-qPxwz7gK24
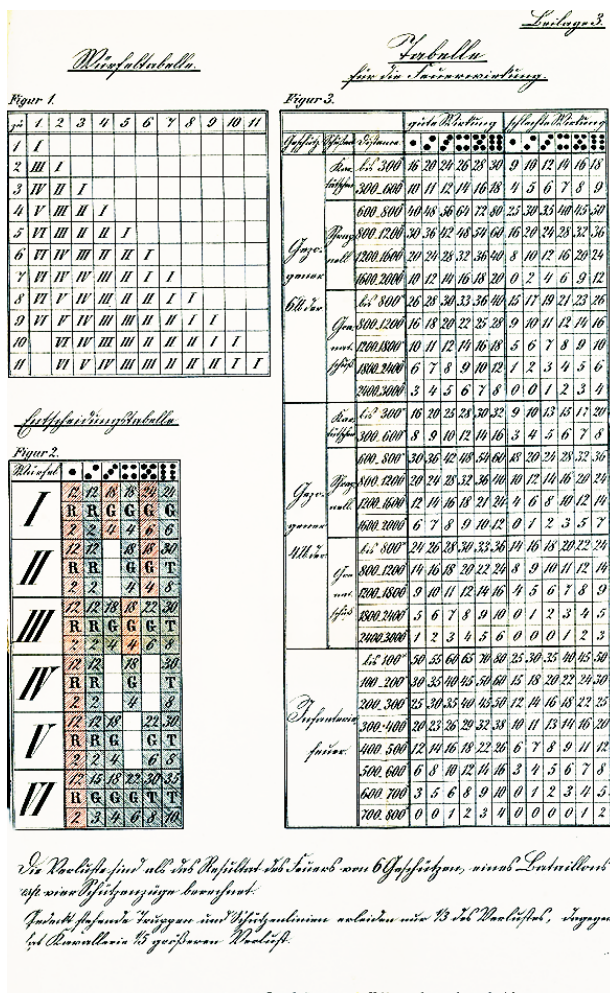
implement it on the regimental and battalion level. Still, he too emphasized the impact morale and unpredictability have on combat: *"Der Würfel ist im Kriegsspiel der Repräsentant des unberechenbaren Zufalls, er soll diejenigen Zufälligkeiten und moralischen Einflüsse ausdrücken, die aus der Gefechtslage nicht ersichtlich sind"* [In Kriegsspiel, the die is the representative of unpredictable chance, it is supposed to express those coincidences and morale influences which aren't apparent from the combat situation] (pp. 37-38).

Following Meckel, Very du Vernois found that *"sich der Neuling aus den Regeln, der Anwendung der Würfel- und Verlust-Tabellen nicht zurecht findet"* [the novice doesn't find their way with the rules, the application of dice and loss tables] (1876, p. vi). He thus argued to optionally discard complex rules and detailed calculation in favor of accessibility, making the players move the pieces on the umpire table based on their own orders. Instead of using dice, the umpire, who had always been considered of dictatorial power during the course of the game, would simply decide unit behavior and combat results ad hoc at their own discretion. This approach is thus called "free Kriegsspiel", while rules-based systems are called "rigid Kriegsspiel".

Altrock's (1908) polemic against rigid Kriegsspiel made it seem as if only free Kriegsspiel was used ever after being introduced by Verdy du Vernois. This, however, is frankly wrong. In 1877, Julius Naumann published his regimental Kriegsspiel, introducing an 8th and 9th die, while at the same time streamlining combat resolution, and emphasizing that decisions made by umpire discretion would be perceived as subjectively biased and could thus negatively impact the game or its participants, which could be mitigated by the use of dice (p. 43), it also created a credibility and validity issue with the lack of umpires with extensive or any combat experience at all. With the turn of the century, Kriegsspiel evolved into various different formats which had little in common with the classic tactical detachment-level or regimental Kriegsspiel, other than the double-blind character and umpire facilitation (Wintjes, 2022, pp. 50-54).

This brief overview shows that when dice were used, they were considered core elements of the game, contributing to the realism of the depicted maneuvers and combats by introducing uncertainty of combat outcomes and unit behavior. Does this mean, however, that modern wargaming is luck-based?

Fog of war: Chance and uncertainty

Carl von Clausewitz, still today perceived as the Grande of theory of war, is commonly understood to have introduced the concept of fog of war as one key aspect. At closer examination, though, this does not hold true and causes the

misconception that more available data would inherently lead to greater success of military decisions (Kiesling, 2001). The term fog can be found four times in On War, two instances of which concern weather and are therein connected to the physical impediment of friction, which is a core concept of his theory. Clausewitz rather uses the fog metaphor to describe unreliability of information, as *"alles Handeln gewissermaßen in einem bloßen Dämmerlicht verrichtet wird, was noch dazu nicht selten, wie eine Nebel- oder Mondscheinbeleuchtung, den Dingen einen übertriebenen Umfang, ein grotesqkes Ansehen giebt"* [all action takes place, so to speak, in a kind of twilight, which, like fog or moonlight, often tends to make things seem grotesque and larger than they really are] (1853, pp. 108-109), and more specificly uncertainty: *"Der Krieg ist das Gebiet der Ungewißheit; drei Viertheile derjenigen Dinge, worauf das Handeln im Kriege gebaut wird, liegen im Nebel einer mehr oder weniger großen Ungewißheit. [...] Der Krieg ist das Gebiet des Zufalls. [...] Er vermehrt die Ungewißheit aller Umstände, und stört den Gang der Ereignisse"* [War is the area of uncertainty; three quarters of the things action in war is based on lie under a fog of more or less uncertainty. (…) War is the area of chance. (…) It increases the uncertainty of all circumstances and impedes the course of events] (1853, pp. 49-50). This is why, for example, NATO risk management tries to mitigate the effect of uncertainty on objectives (Solli, 2022, p. 65). Sabin emphasizes the importance to include this aspect into wargames, but falls into the trap of uncritically adopting the terms of luck and chance to conclude that elements of randomness should be incorporated which have to be balanced with the impact of skill (Sabin, 2012, p. 119).

It is important to contextualize what chance means to Clausewitz. Chance isn't merely random. To Clausewitz, chance results from lack of data that would help understand potential outcomes and the ever-shifting nature of conditions on the battlefield (1853, p. 50), chance then is the inherent deficiency of the human mind to grasp the complexity of reality, a lack of situational awareness, and only thereby luck, as in success despite incomplete knowledge and understanding, is referred to (1853, p. 108). "The unperceivable results of the interaction between the various variables of conflict are abstractly characterised as chance events', where luck becomes the only term to explain a murky cause and effect process in which interaction makes perfect prediction impossible" (Edwards, 2014, p. 14).

Unfortunately, we don't know Clausewitz' thoughts on Kriegsspiel, as it is not mentioned in any of his surviving texts (same as no copy of Moltke's Kriegsspiel from the 1840s seems to have survived). Von Troschke, however, assumed that he was familiar with it, due to favorable mentions made by Premier-Lieutenant

Riege who served under him in the guard artillery brigade in 1830. Troschke furthermore found Clausewitz' denial of the mathematical in war resemble Reisswitz' emphasize of uncertainty (quoted by Trotha, 1870, pp. ix-x).

In fact, Clausewitz famously compared war to a game of cards:

"Wir sehen also, wie von Hause aus das Absolute, das sogenannte Mathematische, in den Berechnungen der Kriegskunst nirgends einen festen Grund findet, und daß gleich von vorn herein ein Spiel von Möglichkeiten, Wahrscheinlichkeiten, Glück und Unglück hinein kommt, welches in allen großen und kleinen Fäden seines Gewebes fortläuft, und von allen Zweigen des menschlichen Thuns den Krieg dem Kartenspiel am nächsten stellt" [We thus see, how, innately, the absolute, the mathematical nowhere in the calculations of the art of war finds solid ground, and that, from the very beginning, a game of possibilities, probabilities, luck and bad luck is introduced, which continues in all big and small threads of its fabric, and puts, of all branches of human doing, war closest to a game of cards] (1853, p. 21)

This is the central concept of general friction (Edwards, 2014, pp. 8-11). Knowing the game and the deck removes chance from the equation, only by shuffling and drawing from the deck a system of causal possibilities is created which cannot fully be deducted and might be expressed by probabilities for any given card to be played in a specific situation. Not coincidentally, Solli uses a game of Texas hold 'em poker' to illustrate risk as a category of acting under the conditions of uncertainty (Solli, 2022, pp. 66-67).

All models are wrong: Luck and contingency

In his "Complete Wargames Handbook", James F. Dunnigan explains how Kriegsspiel dice have been adapted into modern hex-and-counter wargames: "The Combat Results Table (CRT) handles the combat strength differences of units. The CRT also provides for the luck factor so prominent in combat. […] Don't underestimate the element of chance. Not just in warfare, but in most human endeavors, no matter how well we set things up, there's always that strong element of something going wrong. This is why the Combat Results Table is a probability table" (1997, pp. 18-19). Note the resemblance to Clausewitz' and Reisswitz' explanations.

What dice and combat result tables, as originally introduced by Kriegsspiel, and Clausewitz' concept of uncertainty, describe is contingency. *"Kontingent ist etwas, was weder notwendig ist noch unmöglich ist; was also so, wie es ist*

(war, sein wird), sein kann, aber auch anders möglich ist'' [Contingent is what is neither necessary, nor impossible; what thus, as it is (was, will be), can be, but can also be different] (Luhmann, 1984, p. 152). The sheer complexity of a radically contingent reality means that this reality can never be fully grasped, nor completely accurately modelled. This is famously expressed in George Box' aphorism "all models are wrong, but some are useful" (1979, p. 202-203), which is so frequently referenced when it comes to wargame design.

Without contingency, there is no chance. Chance describes the condition of an unforeseen event that singularly contradicts or at least conflicts with an assumed order of things or expected course of events (Hoffmann, 2012, p. 57). It only exists as an expression of perceived lack of causality in the moment a disrupting event occurs (Edwards, 2014, p. 70). Luck then, as in being successful in battle, is a matter of cognitive perception of causal conditions and possibilities or rather the lack thereof. Luck and chance are used to make sense of these events, which might, at close examination, be explained by casual causality of various factors impacting the possible, materialized outcome.

3. SYSTEMS: GAME AND SIMULATION

Whether a game and more specifically a wargame is but a model or a simulation is subject to recurring and heated debates. This redundancy has led many scholars and practitioners to either provide yet another definition, adding to the noise, or ignore the question altogether and rather understand wargaming as a methodological approach without limiting themselves to a specific medium. Acknowledging uncertainty and contingency as core elements of reality and war, as I have laid out above, however, suggests to understand games as systems of representation of possible realities and allows to understand games as models and played games as simulations.

Wargames are sometimes called conflict simulations, in order to allow a more holistic approach and explicitly include non-kinetic and not war-related conflicts. As this denomination derives from commercial board game companies (Lowood, 2016, p. 94), however, it is often disregarded by practitioners and doctrine. To avoid the everlasting dispute, Natalia Wojtowicz has argued to differentiate between recipient and purpose of use of a wargame to provide several specific definitions for the same subject (2023). And there is value in that approach, as wargaming branches into various different formats, requiring different models and procedures. Still it, too, circuits the question at hand.

In wargame design for "professional" use, simulation is often understood to derive from mathematical discipline of Modelling and Simulation, providing

statistical models which can be integrated into wargames or help analyzing the outcome of wargames, especially since computer-based mathematical simulations have been established since the 1990s (Lowood, 2016, pp. 86-87). In fact, however, this quantitative approach roots back to the introduction of operations research in the 1940s (Perla, 2016, pp. 161-166). "The logical answer is to understand the simulation/game as a model–in fact, a series of models structured within an overall model [a system]. […] A wargame, regardless of medium, is nothing more than a model" (Miller, 201, p. 183). The many papers collected in "Simulation and Wargaming" (Turnitsa & Blais & Tolk, 2022) give proof that the "simulationists" operate with a mathematical concept of simulation, which is injecting alterations or actions into a model and the analysis of therefrom deriving consequences over time. Such simulation must be repeatable to collect a mass of statistical data for comparative analysis. This standardized repeatability is commonly disputed to apply to wargames, as they rely so heavily on human interaction (and contingency one should add). Mechanisms of contingency are misunderstood as and reduced to stochastic randomness. Concerning risk management, Bjørn-Erik Solli has thus pointed out: "risk is a lot more than precise measurements or methods of predicition. To truly understand risk, we must look beyond the limits of natural sciences" (Solli, 2022, p. 64).

This criticism of wargaming as random rather than capabilities-dependent comes from the misconception that the incorporation of dice is perceived as representing aspects of reality which cannot be modelled and thus rely on mere luck (Sabin, 2012, p. 118). The usage of terms like chance and luck by Reisswitz, Clausewitz and others, however, is gravely misleading. Dice must be understood as a translation mechanism of a model of contingency into the simulation that creates uncertainty within the latter.

According to Niklas Luhmann, contingency is the very condition enabling human interaction in the first place by denying determinism altogether. Luhmann understands this contingency to apply to all interacting individuals or groups and thus cause the necessity to create synchronizing structures and social order capable of coping with contingency and thereby reducing the risk of disrupting chance (1984, p. 149). This, however, doesn't change the contingent nature of reality. Structures and rules are obeyed, only as if they would actually exist, in order to confine the anarchy of events and mitigate antagonism.

System Theory is, even if not explicitly though apparently, aligning with Johan Huizinga's theory of play and games as necessary precondition of culture. Specifically, Huizinga defines game as a system outside of established rules,

allowing actions which are as such unnecessary and free of real-life consequences, play is voluntary and contained by time, space and rules, creating involvement and tension in a sphere separated from everyday life. Furthermore, to play is to fight (1956, pp. 15-24; 37). To Huizinga, structured fighting and war is a type of game, a rules-structured exception from usual social interactions (pp. 101-118). Because of contingency we can play, that is act as if the game's rules were real. That is the very meaning of simulare: acting as if, representing, depicting, imitating – that is creating synthetic experiences by making decisions while being plagued by uncertainty (Perla, 2016, p. 173). A wargame that is played is a simulation.

In his 2014 thesis researching the utilization of chance and uncertainty in wargames for education and training, Nicholas Edwards has pointed out that the reception of the training audience heavily impacts the design of models, as players' reaction might misalign with the design intent, and that thus the context of the wargame determines to which degree uncertainty is incorporated (Edwards, 2014). "Randomness offers a top-down method of enforcing the overall influence of general friction's non-linearity upon a game event through a moderated range of potential outcomes" (p. 21), which importantly is non-stochastic and creates tense decision-making (p. 32). As shown above, the alleged randomness of the dice must be understood as modelled contingency, so best call it by its name to avoid the ubiquitous confusion. A mathematical or stochastic approach to designing models remains a necessary tool for validified simplification, no doubt, as does the successful suspension of disbelieve when it comes to the players' perception of (in-)credible outcomes (pp. 46-52.) The golden spot fluctuates on a range in between.

4. CONCLUSION

PWe might still be stuck in an unresolved dispute between a quantitative analysis understanding of simulation and a much older synthetic understanding of simulation (Perla, 2016, pp. 166-175). Nonetheless, I hope to have contributed to a more holistic understanding of wargames as simulations and thus provided an impulse to condense the various different understandings of terms and concepts regarding wargaming, specifically the concept of wargame itself. Understanding wargame design more as art than science might be charming, but is also miscrediting and misleading.

This is not to discredit quantitative methods or Modelling and Simulation by any means, they are most useful tools for analysis and providing models which can be included into wargames and are key aspects of wargame design. However, it would be presumptuous to claim that analysis could only be based on mathematical

process. It is rather to alert that wargaming, same as war, will always remain a human-centered interactive exercise, fundamentally characterized by uncertainty caused by contingency, and the fundamental importance of researching and analyzing these aspects within the simulation that is a wargame, especially as history has proven that "bigger or smaller emotions" (Reisswitz, 1824, p. 8) and "chance" have profound impact on the course of events, even though they reach into the realm of the unmeasurable, denying fully accurate modelling. And it might well hint towards a necessity and the potential of incorporating and emphasizing elements and representations of uncertainty into analytical models as well. I am curious to learn about the results of such experiments Colonel Olaf Werner of NATO Joint Force Training Center announced at DSET24 in May 2024, including multi-blind aspects in Course of Action wargames.

Wargames provide decision-making experience and knowledge which can be applied to the real world, as such they create, challenge or reinforce systems of thought. Concerning wargame design for education and training, James Sterrett has argued to only incorporate the potential to fail when it comes to faulty planning by the players, because the possibility of a plan to fail altogether due to friction and uncertainty would be common knowledge and deprive of causality-based learning (Edwards, 2014, p. 26). The question of purpose always guides the design and application. Knowing, however, that play creates systems, we need to be careful to challenge assumptions for the benefit of education, training and analysis. Wargaming should rather make us comfortable with Black Swans. "We need a key human quality to comprehend risk beyond the theoretical. One needs a lively imagination to think of several potential futures of varying likelihood" (Solli, 2022, p. 64). Wargames emphasizing contingency provide the impulse and mental space to do so, increasing the resilience of leaders, and might in fact otherwise lead to "flawed decisions as a consequence of being misguided" (Solli, 2022, p. 65).

With Reisswitz, Huizinga, Luhmann and Perla, we must argue that (war)games are simulations at heart. Graham Longley-Brown has condensed a definition that might fit this understanding the most: "Adversarial and oppositional by nature, a wargame is an immersive simulation, not involving the operations of actual forces, in which the course of events shapes, and is shaped by, decisions made by the players" (Longley-Brown, p. 46). It was this human decision-centered approach in a multi-blind environment which made Reisswitz' Kriegsspiel such a success compared to earlier wargames in the first place, as the players simply acted as commanders and did not have to know any rules, and because thereby and by including dice it managed to properly simulate friction and uncertainty

(Wintjes, 2022, pp. 37-38). Based on my findings I will conclude by stating that every game as such an occurrence of human interaction, based on one or several models forming a system which takes contingency into account, is a simulation, and that therein lies the great potential to better understand reality, prepare for, resolve and prevent conflict and war, and ultimately save lives.

REFERENCES

Altrock, K. v. (1908). Das Kriegsspiel. Eine Anleitung zu seiner Handhabung [The wargame. Instructions on its use]. Mittler.

Anonymous (1846). Anleitung zur Darstellung militairischer Manöver mit dem Apparat des Kriegs-Spiels [Instructions for the depiction of military maneuvers with the apparatus of the war-game]. Mittler. https://digital.bibliothek.uni-halle.de/hd/content/pageview/1640210

Box, G. E. P. (1979). Robustness in the strategy of scientific model building. In R. L. Launer, G. N. Wilkinson (Eds.), *Robustness in Statistics* (pp. 201–236). American Press. https://doi:10.1016/B978-0-12-438150-6.50018-2

Clausewitz, C. v. (1853). Vom Kriege, Band 1 (2. Auflage) [On war, 1st colume (2nd edition)]. Dümmler. https://www.digitale-sammlungen.de/en/view/bsb10784484

Decker, K. v., & Witzleben, A. v., et. al. (1828). Supplement zu den bisherigen Kriegsspiel-Regeln. Mittler. https://www.digitale-sammlungen.de/en/view/bsb11712429

Dunnigan, J. F. (1997). The Complete Wargames Handbook. https://www.professionalwargaming.co.uk/Complete-Wargames-Handbook-Dunnigan.pdf

Edwards, N. (2014). *What considerations exist in the design of the elements of chance and uncertainty in wargames utilized for educational and training purposes?* [Unpublished master thesis]. King's College, London. https://slideshare.net/slideshow

Hoffmann, A. (2012). Kontingenzerfahrung und Kontingenzbewusstsein aus historischer Perspektive [Experience and awareness of contingency in historical perspective]. In: K. Toens, U. Willems (Eds.), Politik und Kontingenz [Politics and Contingency] (p. 49-64). Springer.

Huizinga, J. (1956). Homo Ludens. Vom Ursprung der Kultur im Spiel [On the origin of culture in play] (26. Edition). Rowohlt.

Kiesling, E. (2001). On War. Without the Fog. *MILITARY REVIEW*, September-October, 85-87. https://www.clausewitz.com/bibl/Kiesling-OnFog.pdf

Langley-Brown, G. (2019). Successful Professional Wargames: A Practitioner's Handbook (ed. John Curry). The History of Wargaming Project.

Lowood, H. (2016). War Engines: Wargames as Systems from the Tabletop to the Computer. In P. Harrigan, M. G. Kirschenbaum (Eds.), *Zones of Control: Perspectives on Wargaming* (pp. 83-105). MIT Press.

Luhmann, N. (1984): Soziale Systeme. Grundriß einer allgemeinen Theorie [Social Systems. Outline of a general theory]. Suhrkamp.

Meckel, J. (1873). Studien über das Kriegsspiel [Studies on the wargame]. Mittler. https://www.digitale-sammlungen.de/en/view/bsb11164379

Miller, B. J. (2016). The Application of Statistical and Forensical Validation to Simulation Modeling in Wargames. In P. Harrigan, M. G. Kirschenbaum (Eds.), *Zones of Control: Perspectives on Wargaming* (pp. 183-200). MIT Press.

Naumann, J. C. F. (1877). Das Regiments-Kriegsspiel. Versuch einer neuen Methode des Detachements-Kriegsspiels [The regimental Kriegsspiel. Attempt of a new method of the detachment-level Kriegsspiel]. Mittler. https://www.digitale-sammlungen.de/en/view/bsb11361290

Opiz, J. F. (1806). Das Opiz'sche Kriegsspiel: Ein Beitrag zur Bildung künftiger und zur Unterhatung selbst der erfahrensten Taktiker [Opiz' wargame: A contribution to the education of future and entertainment of even most experienced tactitians]. Hendel. https://www.digitale-sammlungen.de/de/view/bsb10594830

Perla, P. (2016). Operations Research, System Analysis, and Wargaming: Riding the Cycle of Research. In P. Harrigan, M. G. Kirschenbaum (Eds.), *Zones of Control: Perspectives on Wargaming* (pp. 159-182). MIT Press.

Reisswitz, G. v. (1824). Anleitung zur Darstellung militairischer Manöver mit dem Apparat des Kriegs-Spieles [Instructions for the depiction of military maneuvers with the apparatus of the war-game]. Trowitzsch. https://www.digitale-sammlungen.de/en/view/bsb11766125

Sabin, P. (2012). Simulating War: Studying Conflict through Simulation Games. Bloomsbury.

Simpson Jr., W. L. (2015). Aa Compendium of Wargaming Terms. https://connections-wargaming.com/wp-content/uploads/2015/06/a-compendium-of-wargaming-terms-7-july-2015.pdf

Solli, B.-S. (2022): The Essence of Risk: What You Need to Know About Risk While Serving at a Joint Operational Headquarters. *The Three Swords*, 38, 63-67. https://www.jwc.nato.int/application/files/5316/7092/6102/EssenceofRisk_DEC2022.pdf

Trotha, T. v. (1870). Anleitung zum Gebrauch des Kriegsspiel-Apparates zur Darstellung von Gefechtsbildern mit Berücksichtigung der Wirkung der jetzt gebräuchlichen Waffen [Instructions for using the wargame-apparatus to display combat situations, taking into account the effect of currently used weapons]. Mittler. https://www.digitale-sammlungen.de/en/view/bsb11343917

Tschischwitz, W. v. (1870). Anleitung zum Kriegsspiel (3rd edition). Graveur. https://www.digitale-sammlungen.de/en/view/bsb11343916

Turnitsa, C. & Blais, C. & Tolk, A. (Eds.). (2022). *Simulation and Wargaming.* Wiley.

Verdy du Vernois, J. A. F. W. v. (1876). Beitrag zum Kriegsspiel [Contribution to the wargame]. Mittler. https://www.digitale-sammlungen.de/en/view/bsb11337860

Wintjes, J. (2022). A School for War – A Brief History of the Prussian Kriegsspiel. In C. Turnitsa, C. Blais, A. Tolk (Eds.), *Simulation and Wargaming* (pp. 25-64). Wiley.

Wojtowicz, N. (2023). Wargaming Experiences II: Discussions.

116