A Game of Contexts: Prussian-German Professional Wargames and the Leadership Concept of Mission Tactics 1870–1880

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Introduction

Professional wargames (*Kriegsspiele*) had been adopted by the Prussian army at the start of the nineteenth century. They received a major boost after the Prussian successes during the German Wars of Unifications (1864–70) and were subsequently introduced by the armies of other European powers, the United States and Japan. They continued to play a vital role in the twentieth century, and all major German campaigns during the First and Second World Wars were prepared by wargames.[1] I provide a descriptive analysis of the main forms of Prussian-German wargames during the key decade between 1870 and 1880.[2] I then argue that the success of German wargames can be understood in

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1   John P. Young, *A Survey of Historical Developments in War Games* (Bethesda, 1959), pp. 23–91.

2   Edmund Edler von Mayer, *Eine Studie über das Kriegsspiel* (Wien, 1874); Klemens Wilhelm Jacob Meckel, *Studien über das Kriegsspiel* (Berlin, 1873); Klemens Wilhelm Jacob Meckel, *Der verbesserte Kriegsspiel-Apparat* (Berlin [1875]); Klemens Wilhelm Jacob Meckel, *Anleitung zum Kriegsspiele. Erster Theil: Direktiven für das Kriegsspiel* (Berlin, 1875); Naumann, *Regiments-Kriegsspiel: Versuch einer neuen Methode des Detachments-Kriegsspiels* (Berlin, 1877); Neumann, *Directiven für das Festungs-Kriegsspiel* (Berlin, 1872); Lebrecht Ernst Michael Thilo von Trotha, *Anleitung zum Gebrauch des Kriegsspiel-Apparates zur Darstellung von Gefechtsbildern mit Berücksichtigung der Wirkung der jetzt gebräuchlichen Waffen* (Berlin, 1870); W. von Tschischwitz, *Anleitung zum Kriegs-Spiel*

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the context of the military concept of mission tactics (*Auftragstaktik*). I will show how both wargames and mission tactics were driven in their turn by the even wider context of technological revolution in the fields of firearms and railway transport. I will argue that these contexts ushered forth professional wargames along an initially tenuous trajectory, before they became a key instrument in training and planning for war in the hands of the Great General Staff of the Prussian and hence the German army.[3]

Prussian-German Wargames 1870–1880

Wargames used for professional purposes were first developed around 1800 in the German-speaking parts of Europe. In this early period, designers invented and tested various types of wargames. They grappled with a trade-off between two desirable attributes: realism on the one hand, and simplicity, and hence playability, on the other hand. Increased realism often implied increased complexity, resulting in decreased playability. There was no single and stable answer to this trade-off problem, and wargame designers rose to this challenge with a host of creative solutions.[4] The most successful wargame in this early age was developed by Georg Leopold von Reiswitz (1764–1828) (see Fig. 1). King Frederick William III of Prussia sponsored the introduction of this wargame in the Prussian army in 1812. The basic elements of Reiswitz's game consisted of a huge game board with customizable topographical squares; pieces representing infantry, cavalry, and artillery; and rules for movement and conflict resolution. The game was played by two opposing teams consisting of several officers under the direction of an umpire (*Vertrauter*). Each team of players occupied a separate room. The game started with a general statement by the umpire to the two opponents, a precise indication of the place, nature, and number of their available forces, plus the mission they had to complete. Each turn, the teams handed their written directions to the umpire. This person, usually a senior officer, was given certain discretionary powers in his application of the rules; for instance he could forbid unrealistic moves. After each game there was a discussion about the various decisions made during the game. The most fundamental additions to this game were introduced in 1824 by Reiswitz's son Georg Heinrich Rudolf Johann (1794–1827). Rather than use a traditional game board, he used a simple topographical map. He also

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(Neisse, 1874, fourth edition). Julius Verdy du Vernois, *Beitrag zum Kriegsspiel. Mit einem Plane* (Berlin, 1876). On German professional wargames in the 1870s see Philipp von Hilgers, *Kriegsspiele. Eine Geschichte der Ausnahmezustände und Unberechenbarkeiten* (München, 2006), pp. 92–6; Claus Pias, *Computer–Spiel–Welten* (München, 2010), pp. 225–8; Peter P. Perla, *The Art of Wargaming. A Guide for Professionals and Hobbyists* no place, 2011), pp. 41–5; Martin van Creveld, *Wargames. From Gladiators to Gigabytes* (Cambridge, 2013), pp. 151–8.

3   To my knowledge there exists no study of the relationship between German professional wargames, mission tactics, and the context of demographic growth and technological change; on these topics first of all see Arden Bucholz, *Moltke, Schlieffen, and Prussian War Planning* (Houndmills, 2001).

4   See Paul Schuurman 'Models of War 1770–1830: The Birth of Wargames and the Trade-off between Realism and Simplicity', *History of European Ideas* 43 (2017), pp. 442–55.

Figure 1. The wargame of Leopold George von Reiswitz (1812) (Stiftung Preußischer Schlösser und Gärten Berlin-Brandenburg). Picture by Roman März, Berlin

introduced the use of dice to simulate chance and uncertainty in the calculation of battle results with combat result tables. These tables translated different throws of the dice into specific combat results, depending on factors such as the type and number of combat troops, firing distance, and terrain type.[5]

The wargames used by the Prussian army in the decades following the Napoleonic wars (until around the 1870s) continued to follow the design of the Reiswitz games. Most wargames considered in this article were designed by Prussian officers with the aim of training colleagues of different ages and different levels of seniority.[6] Professional wargames were also increasingly used to test specific military plans. While the games by Reiswitz had been played on a small tactical scale that was deemed fit for junior officers, at a later stage wargames were staged on larger scales, including the operational level of entire campaigns. These operational games were played by officers of the Great General Staff and senior officers of the field army.[7] Operational games also included conceptual mechanisms that modelled provisions, munitions, and reinforcements.[8] The target group of serious wargames in the Napoleonic era still included recreational players, but the designers of professional wargames used by the Prussian army emphasized the

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5 See Schuurman, 'Models of War', pp. 442–55.

6 The exception was Captain (later Colonel) Edmund Edler von Mayer; he served not in the Prussian but in the Austrian (later Austro-Hungarian) army. See also Meckel, *Studien*, pp. 5–22; Carl Zipser, *Anleitung zur Darstellung militärischer Manöver mit Hilfe des Kriegsspiel-Apparates, bei Zugrundelegung der neuesten taktischen Normen* (Josefstadt, 1876, second edition), p. 7; Alfred H. Hausrath, *Venture Simulation in War, Business, and Politics* (New York, 1971), p. 20.

7 Meckel, *Studien*, distinguishes tactical, large, and strategic wargames; see also Meckel, *Zum Kriegsspiele*, pp. 7–8; Mayer, *Studie*, pp. 12–14; Zipser, *Anleitung*, pp. 8–9. The precise distinction between these levels is not always clear. My own preferred terms in this context are either 'tactical' or, for higher levels, 'operational'.

8 See Mayer, *Studie*, pp. 12–14; Meckel, *Studien*, pp. 41–5; Meckel, *Anleitung*, pp. 7–8; Zipser, *Anleitung*, pp. 8–9.

seriousness of their games. Their games should not be played for the sake of winning but for the sake of instruction. Some game designers even concluded that the name 'game' was unsuitable to describe a device that was used for the earnest purpose of simulating a military operation.[9]

In the first decades after its introduction, the progress of the Reiswitz game was decidedly uneven. Funds were made available for the procurement of the game by each Prussian regiment. We know of the existence of wargame clubs formed by Prussian officers in Berlin and other garrison towns, suggesting that the serious character of these games did not necessarily preclude playing for fun. A journal devoted to the game was published, but was not widely read.[10] In his *Geschichte des 24sten Infanterie-Regiments*, Captain Franz von Zychlinski informs us that the game, which after all had been introduced by the king himself, was stored as a precious gift by the regiment commander, who held it in almost equal esteem as the regimental flag. Zychlinksi also tells how one game ended in a drunken brawl, and how this uproar ended the career of the game in the Twenty-Fourth Infantry Regiment.[11] The game was reported as no longer available in 1846. It seems that neither the stretch of peace between 1815 and 1864, nor the political conservatism of the period 1815–48, nor the political reaction after the failed revolution of 1848 were suitable for the use of a novel military training device. It wasn't until the start of the "New Era" (*Neue Ära*) with King Wilhelm, Chancellor Otto von Bismarck, and Minister of War Albrecht Theodor Emil von Roon, that we see substantial changes in foreign and military policy. These changes contributed to the victories in the Wars of German Unification (1864–70).[12]

It is only around 1860 that professional wargames gained a firmer foothold – not only in the Great General Staff, but also in the field army.[13] In the 1870s the actual use of wargames became generally accepted in Germany, and also increasingly amongst other

9   Mayer, *Studie*, p. 3; repeated by Zipser, *Anleitung*, p. 1; see also [Anonymous] 'Anleitung zum Kriegsspiele', *Organ der Militär-wissenschaftliche Vereine* 13 (1876), pp. 65–74 (65).

10   Constantin von Altrock, *Das Kriegsspiel: Eine Anleitung zu seiner Handhabung. Mit Beispielen und Lösungen* (Berlin, 1908), p. 164; Young, *Survey*, pp. 21–2.

11   Franz von Zychlinski, *Geschichte des 24sten Infanterie-Regiments. Zweiter Theil: Von 1816–1838* (Berlin, 1857), pp. 196–9.

12   On post-Napoleonic reaction see Christopher Clark, *Iron Kingdom. The Rise and Downfall of Prussia, 1600–1947* (London, 2007), pp. 399–408; on the 1859–60 army reform see Manfred Messerschmidt, *Handbuch zur deutschen Militärgeschichte 1648–1939. Vol. IV.1 Militärgeschichte im 19. Jahrhundert 1814–1890* (München, 1975), pp. 160–217; against the idea of a military rupture with the time before 1859–60, however, see Dierk Walter, *Preußische Heeresreformen 1807–1870. Militärische Innovation und der Mythos der 'Roonschen Reform'* (Paderborn, 2003), pp. 52–3.

13   Ernst Heinrich Dannhauer, review of Julius Verdy du Vernois, *Beitrag zum Kriegsspiel* (Berlin, 1876), in *Militair-Wochenblatt* 61 (1876), pp. 1063–7 (1063); [Anonymous] *Anleitung zur Darstellung militärischer Manöver mit dem Apparat des Kriegs-Spiels* (Berlin, 1846), p. iii; Bucholz, *Moltke, Schlieffen*, p. 30; see also Stephan Leistenschneider, *Auftragstaktik im preußisch-deutschen Heer 1871–1914* (Hamburg, 2002), p. 40.

Table 1. Publications about wargames in German (including reprints) listed in Altrock, *Das Kriegsspiel*, pp. 160–90.

Decade	Number of publications about wargames
1801–10	3
1811–20	3
1821–30	6
1831–40	1
1841–50	2
1851–60	0
1861–70	11
1871–80	31
1881–90	7
1891–1900	11

nations.[14] Wargames fully partook in the flurry of military publications after the wars of 1864–70, and came to be widely praised as useful devices to further military leadership.[15] The pattern of stagnation between the defeat of Napoleon and the start of the 1860s, followed by a substantial increase in the 1860s, and a dramatic spike in the 1870s, is confirmed when we consult the bibliography of wargames in *Das Kriegsspiel* (1980) by Constantin von Altrock (1861–1942) – see Table 1. In subsequent decades, wargames during times of peace could ruin careers of officers almost the way an actual war could.[16]

The increased output of wargame literature in the 1860s and, especially, the 1870s was part of a military culture that permeated Germany during and after the string of spectacular military victories of the Wars of Unification.[17] The output of military texts not only included manuals for wargames themselves, but also showed a growing dissatisfaction with the conventional form of the game.[18] The deficiencies of the Reiswitz game type were listed most systematically by First Lieutenant (eventually General) Klemens Wilhelm Jacob Meckel (1842–1905). He was a veteran from the Franco–Prussian war and he would serve as an advisor to the Imperial Japanese Army General Staff between 1885 and 1888. In his *Studien über das Kriegsspiel* (1873), Meckel observed that the decisions of the umpire were caught up in a mechanical and artificial pattern (*Schema*) of rules.[19] The rules did not help the umpire to impart his military views

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14 Trotha, review of Julius Verdy du Vernois, *Beitrag zum Kriegsspiel* (Berlin, 1876), in *Militair-Wochenblatt* 6 (1876), pp. 102–7 (102); [Anonymous] 'Anleitung zum Kriegsspiele', *Organ der Militär-wissenschaftlichen Vereine* 13 (1876), p. 66; Zipser, *Anleitung*, p. 3.

15 Nauman, *Regiments-Kriegsspiel*, p. vii; see also Leistenschneider, *Auftragstaktik*, p. 10; Bucholz, *Moltke, Schlieffen*, p. 85.

16 Bucholz, *Moltke, Schlieffen*, p. 108.

17 See Wolfram Wette, *Militarismus in Deutschland. Geschichte einer kriegerischen Kultur* (Frankfurt am Main, 2011), pp. 48–64.

18 Bucholz, *Moltke, Schlieffen*, p. 85.

19 Meckel, *Studien*, pp. 19, 24–5, 27, 47, 59.

to the players, but rather formed an impediment, making the role of the umpire unattractive. The rules of the game failed to do justice to the particular colour and character of each combat situation and gave the exercise a needlessly artificial character. The detailed calculation of losses with combat result tables made the game too slow, without substantially adding to the realism of its outcomes.[20] Moreover, games were often directed by uninterested or incapable umpires. These episodes of uninspired direction only exacerbated mindless and mechanical styles of playing, something to which the game was already predisposed.[21]

Meckel not only offered criticism; he (and other officers) tried to present solutions as well. He started with the observation that in the first decades of the nineteenth century military textbooks were based on general philosophical principles, presented in an abstract way. Whereas this earlier military literature had tried to grasp warfare in terms of a *theoretical science*, contemporary literature emphasized its character of a *practical art*. Meckel stressed the point that he lived in an era that favoured *practical* action; and if art consisted in the autonomous realization of an idea, then warfare in the hands of a capable officer was deemed an *art*.[22] Hence, if warfare was a practical art, then the wargame umpire was an artist—or as Meckel described it, 'an officer with the gift of independent action and phantasy'.[23] The umpire-as-artist is not needlessly impeded by the rules of the game and uses them in such a way that he can do justice to each particular situation.

Hence the challenge for Meckel was to formulate rules for a wargame as a form of art that would not restrict a creative umpire with mechanical limitations.[24] The crux of the problem, as he saw it, were the dice and the combat resolution tables. Meckel gives the following example of a game situation where three infantry platoons (red) attack two infantry platoons (blue): blue is placed in a favourable defensive position, while red attacks across an open field without cover. By attacking, red exposes itself to blue's gunfire. In a traditional game, even if red has lost one-third of its forces by the time it reaches the entrenched position of blue, its numerical equality at this point implies that it still has a good chance of defeating blue. This, Meckel pointed out, is a completely unrealistic scenario. Red's morale will suffer long before it has lost one-third of its men during the attack. So, the traditional game rules were unrealistic. Their mechanical character presented a young officer with 'a world of illusions' that were bound to cause 'disillusionment and despondency' as soon as they were confronted with the reality of battle.[25]

What made conventional wargames especially unsuitable in Meckel's view was that a complete operation from start to finish, such as the attack by red against blue in the above example, was expressed by one single mechanical calculation. This single calculation

20   Meckel, *Studien*, pp. 24–5.
21   Meckel, *Anleitung*, p. 59; see also Trotha, *Anleitung*, p. 15; Altrock, *Das Kriegsspiel*, p. 164; Young, *Survey*, p. 21.
22   Meckel, *Studien*, p. 6; see also p. 13; Trotha, *Anleitung*, p. 1.
23   Meckel, *Studien*, p. 27 (translations of German quotations are my own, unless stated otherwise).
24   Meckel, *Studien*, p. 28; see also Naumann, *Regiments-Kriegsspiel*, pp. vii, 12.
25   Meckel, *Studien*, p. 34.

did not take into account highly relevant intermediate steps. To address this problem, in his *Studien* Meckel proposed a step-by-step procedure, wherein an active umpire, who takes stock after each round of combat, considers the physical and moral conditions for that specific round, and then decides the odds for a favourable throw of the dice by picking the relevant column in the relevant combat results table. To use another example, in the case of a deteriorating morale caused by steeply increasing losses during a hazardous attack, the umpire could decrease the odds for a favourable dice result from 'medium' to 'small' and subsequently even to 'smallest'. This would preclude the highly unlikely situation in which the remnants of three shattered attacking red platoons overcome two well-entrenched blue platoons. In this way the umpire had the chance to play the game as a true artist, with a sensitivity for the shifting tides of battle, and with the power to translate this feeling (*Fingerspitzengefühl*) to facts.[26]

Meckel's idea to increase the realism of wargames through a more sophisticated use of dice and combat result tables by the umpire can also be found in the works of contemporary game designers.[27] All these games may have gone some way in overcoming complaints about the overly mechanical and hence unrealistic character of the original Reiswitz game. But this was not the only complaint raised by Meckel: he also cautioned that the detailed calculation of losses with combat result tables made the game too slow. This latter complaint indeed seems to have accompanied the Reiswitz game right from its inception and was corroborated by descriptions of its fate during the Twenty-Fourth Infantry Regiment (as mentioned above). However, it is very hard to see how the innovations of Meckel made gameplay faster and easier; and it is very easy to see how the step-by-step use of combat result tables actually increased the cumbersome and tedious character of previous wargames.[28]

The realism–playability trade-off mentioned at the start of the present section remained a relevant issue as wargames developed. The question this raises is, how could professional wargaming be made more realistic than Reiswitz's game (which Meckel may very well have achieved), without sacrificing simplicity and hence playability (which Meckel almost certainly failed to do)? A surprisingly simple answer was formulated by Julius von Verdy du Vernois (1832–1910). In 1867 he was appointed head of the intelligence section of the Great General Staff, in which capacity he served throughout the Franco–German war. He rose to the rank of Major General and from 1889 to 1890 he served as Minister of War. He was extremely interested in the education of Germany's officer corps, and this is the background for his radical wargame innovations.[29]

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26 Meckel, *Studien*, pp. 34–6; see also p. 20.
27 Tschischwitz, *Anleitung*, pp. 1, 25; Trotha, *Anleitung*, pp. 1, 13; Neumann, *Directiven*, pp. 1, 18–21; Mayer, *Studie*, pp. 43–60. Wilhelm von Tschischwitz (1831–1911) was a Captain of the Second Infantery Regiment of Upper Silesia when he wrote his *Anleitung zum Kriegsspiel*; and Major Neumann was an engineer and professor at the Berlin *Artillerie-Schieß-Schule*.
28 Young, *Survey*, p. 21; Dannhauer, review of Verdy, p. 1063.
29 Klaus Schlegel, 'General der Infanterie Dr. phil. h.c. Julius von Verdy du Vernois', in *Deutsches Soldatenjahrbuch 1982. Dreissigster deutscher Soldatenkalender* (München, 1982), pp. 71–5.

While Meckel had allowed the umpire large measures of discretion in the use of dice and combat result tables, Verdy stopped the use of dice, tables, and detailed rules entirely. He modelled this simplification on the staff rides (*Übungsreisen*) of the German army.[30] Staff rides were exercises in which officers in the field conducted imaginary operations with imaginary troops over actual ground. All orders and messages were written out and submitted to an umpire. Rides were held on different hierarchical levels by different service arms. The rides of the Great General Staff simulated operations of entire army corps.[31] Verdy was well acquainted with staff rides and in the introduction to his *Beitrag zum Kriegsspiel* (1876) he writes how it had occurred to him that, when actual terrain was replaced by general staff maps, the simple principles used for staff rides could also be used for wargames. In staff rides, no use was made of fixed rules, tables, or dice; rather, the umpire decided the outcome of battles as he saw fit – but he was supposed to give arguments for his decisions during the subsequent evaluation.[32] Verdy presented a wargame that used this same 'abridged' (*abgekürzte*) method, hoping it would please 'especially those esteemed comrades who until now may have been daunted by the combat resolution tables and the rules' of earlier wargames.[33]

Verdy's abridged game in many ways remained within the broad format established by Reiswitz. The game was played by two teams in separate rooms under the direction of an umpire who had a general map. At the start of each game the umpire formulated a general situation (*General-Idee*) for each of the two opponents, followed by a more specific mission statement (*Aufgabe*) for each of the participating units in that game.[34] Contrary to Reiswitz's game, however, Verdy's game was played on real staff maps; and while previous wargames had used special game pieces, Verdy's game could be played with simple matches.[35] The umpire used a measuring rod and a ruler to determine movement distances. The two opponents were allowed to push their units forward until the moment when the umpire decided that they had come within sight of each other, at which point play proceeded turn by turn, based on the written orders of the commander of each party. In Verdy's wargame the umpire had a very active role. Combat results depended solely on the umpire, who made flexible estimates based on the specific conditions.[36]

The text of Verdy's *Beitrag* does not provide a manual, but rather presents an overview of a single mock game from start to finish – one based on a scenario invented by Verdy. The mock game started as follows. On 1 August of an unspecified year, after an imaginary

30   Verdy, *Beitrag*, p. vi; see also Dannhauer, review of Verdy, p. 1065; Bucholz, *Moltke, Schlieffen*, p. 85; David Ian Hall, 'Battlefield Tours and Staff Rides: Prussian and German Traditions', *Connections. The Quarterly Journal of the Partnership for Peace Consortium of Defence Academics and Security Studies Institutes* 1 (2005), pp. 3, 93–101.

31   Bucholz, *Moltke, Schlieffen*, pp. 34, 103–4.

32   Verdy, *Beitrag*, p. vi; see also [Anonymous] review of: Julius von Verdy du Vernois, *Beitrag zu den Kavallerie-Uebungsreisen* (Berlin, 1876), in *Militair-Wochenblatt* 41 (1876), pp. 721–9 (722–7); Young, *Survey*, p. 66; Bucholz, *Moltke, Schlieffen*, p. 85.

33   Bucholz, *Moltke, Schlieffen*, p. ix.

34   Verdy, *Beitrag*, pp. 3–5.

35   Altrock, *Kriegsspiel*, p. 33.

36   Verdy, *Beitrag*, pp. 13–68; Young, *Survey*, pp. 93–5.

East Division has been pushed back by a stronger West Division from Markranstäd to Leipzig, the outposts of the opponents face each other along the Elster river. On the evening of that day Zwenkau is occupied by a detachment of the West Division. The situation then zooms in from the level of two complete enemy divisions to the more detailed level of two enemy detachments. The East Detachment of the East Division receives information from its division headquarters about the occupation of Zwenkau by a West Division on 2 August 5 a.m. The mission of this East Detachment is to protect the division's left flank near Connewitz and to explore Zwenkau and its environments. For this mission the East Detachment is allocated two battalions of infantry, two squadrons of cavalry and one battery of artillery. The West Division plans to attack Leipzig on 2 August 9 a.m. from the direction of Lindenau; one of its detachments, called the West Detachment (the one facing the East Detachment of the East Division) receives the order to support this attack by advancing east of the Floßgraben canal and along the right bank of the Pleiße river. The West Detachment is allocated three infantry divisions and four squadrons of lancers for its mission. With this information the game starts. The leaders of the different elements of each detachment are played by different members of the participating teams of imaginary officers. Each step of each opponent and each decision of the umpire is minutely described; and each event description is followed by an analysis, often in counterfactual mode: commander X did this, but rather should have done that.[37]

Although Verdy's wargame was novel in its ruthless simplicity, he emphasized the continuity between his wargame and previous wargames. Hence, the wargame club to which he belonged had followed similar procedural changes to the game nearly 20 years earlier.[38] In his review Thilo von Trotha also remarked that Verdy's game 'in essence matches the practice that had established itself in the older wargame'.[39] In a similar vein Meckel remarked that the Reiswitzian game type had been played *in spite of* rather than *thanks to* its specific rules.[40] Hence he was not surprised to note that already in the previous decades, players had indeed started to bend the otherwise inflexible rules to their liking, or – to use Meckel's characteristically astute description – players had started 'emancipating themselves from the rules'.[41] Moreover, in the preface to his *Kriegspiel* (1875), he explained that he had developed his own game at the explicit behest of Verdy.[42]

The old Reiswitz game type and the new Meckel game type made use of explicit rules, combat result tables, and dice, and would become known as 'rigid wargame' (*strenges Kriegsspiel*), while the alternative type established by Verdy would become known as 'free wargame' (*freies Kriegsspiel*).[43] Authors pointed out that the free wargame could only be played with very good umpires, whose role was much more vital

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37   Verdy, *Beitrag*, p. 23.
38   Verdy, *Beitrag*, p. viii.
39   Trotha, review of Verdy, p. 102.
40   Meckel, *Anleitung*, p. 6.
41   Meckel, *Anleitung*, p. 6, and [Anonymous] 'Anleitung zum Kriegsspiele', p. 66.
42   Meckel, *Zum Kriegspiele*, 'Vorwort', pp. i–ii. See also Meckel, *Studien*, pp. 38–9; and Dannhauer, review of Verdy, pp. 1063, 1067.
43   Young, *A Survey*, pp. 23–6.

than the role of umpires in rigid wargames; so while the free wargame might be suitable for the officers of Great General Staff, regimental officers might be better served by a rigid wargame.[44] Although the rigid wargame thus continued to be played, Verdy's wargame gave its players and its arbiters exactly the kind of non-mechanical exercise in the practical art of warfare that the times seemed to demand, and it became a huge success.[45] Most subsequent German wargames were of the free (Verdy) type.[46] Free wargames were also implemented by the armies of other nations. The American Brigadier General Farrand Sayre (1861–1952) strongly believed that his compatriots should opt for the free rather than the rigid wargame, observing that 'Rigid Kriegsspiel has been found by the Germans, who have given it thorough trial, to be too great a strain upon the patience; and we have less patience than the Germans.'[47] Both the German and the Russian general staffs would end up using a free wargame to test encounters similar to the one that actually took place in East Prussia in the initial weeks of the First World War in 1914, and although the two staffs drew similar conclusions, the German victory at the battle of Tannenberg (under Verdy's pupil Paul von Hindenburg) has been ascribed, amongst other things, to the fact that the German army based its preparations on these wargame lessons, while the Russian army failed to do the same.[48]

Wargames and Mission Tactics

The free wargames of Verdy and their rigid predecessors served as practical case studies: they allowed senior officers to propose a mission and left the competing teams the freedom and opportunity to choose the means to accomplish this mission.[49] Viewed from this perspective of freedom of means to reach fixed ends, the most relevant context for Prussian wargames is formed by the Prussian military leadership concept of mission tactics (*Auftragstaktik*). For a good introduction to this concept we can again turn to the work of Verdy. He published a multi-volume *Studien über Truppenführung* ('Studies on Troop Leadership') in 1873–74, shortly before he published his wargame (the *Beitrag*) in 1876. If war is an art that consists in the autonomous realization of an idea (see Meckel in the previous section), then officers should be able to swiftly and flexibly translate the intentions of their superiors into successful action under capricious circumstances, for example changes due to interaction with the enemy, as well as topographical, meteorological, and logistical considerations. Accomplishing the mission in accordance with the

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44   Meckel, *Zum Kriegsspiel*, p. 36; Naumann, *Regiments-Kriegsspiel*, p. vii; see also Verdy, *Beitrag*, p. vi.
45   Altrock, *Kriegsspiel*, pp. 166–71. Verdy was not the first to publish a free wargame; this honour belongs to [Anonymous] *Elementar-Begriffe vom Kriege, durch Beispiele erläutert, mit einer Anleitung zu praktischen Uebungen für Militz-Offiziere in Form eines technischen Kriegsspieles* (Zürich, 1840).
46   Young, *Survey*, pp. 65–6, 104.
47   Farrand Sayre, *Map Maneuvres and Tactical Rides* (Fort Leavenworth, Kansas, s.d.), p. 15.
48   Hausrath, *Venture Simulation*, pp. 23–5; Schlegel, 'Verdy', p. 74.
49   See also Mayer, *Studie*, pp. 14–16; Hausrath, *Venture Simulation*, p. 9.

aims of the commander is more important than using correct rules and fixed procedures – assuming that the rules for successful warfare can be assessed in the first place.[50] Given the constant friction of the inherent dynamics of armed conflict it is never clear 'whether one has to take hold to the rules or their exception'.[51] And although warfare indeed seems to be subject to certain rules, the whole point of the military art consists in the ability to weigh the importance of different rules according to different circumstances. Commanders should order *what* mission has to be accomplished, not *how* exactly this should be accomplished.[52] In his recent *Auftragtragstaktik im preußisch-deutschen Heer 1871–1914* Stephan Leistenschneider explains that mission tactics allowed and even anticipated that officers would disobey orders – given the appropriate circumstances.[53] At the same time they were supposed to realize the *intentions* of their superiors (*Gefechtszweck*) with the strictest discipline (*mit strengsten Gehorsam*).[54]

The general *concept* of mission tactics was developed in the course of the nineteenth century and was not strictly limited to the tactical levels, but also embraced higher operational levels.[55] This concept was already applied before it became part of an official doctrine; and it became part of a doctrine a few years before the term itself was coined. Leistenschneider observes that mission tactics were applied on an improvised basis in the Wars of Unification and especially during the Franco–German War of 1870–71 (more on this below), while the concept was developed more systematically in the years after the Wars of Unification.[56] In 1888 a new *Exerzir-Reglement* was introduced that embraced and incorporated the principles of mission tactics.[57] The *term Auftragstaktik* (as opposed to the older *concept*) was most likely coined in 1892 by Albrecht von Bugoslawski (1834–1905), who used the term in a derogatory sense in contrast to the traditional *Normaltaktik* that he himself preferred.[58]

Analysis by the German army of the initial use of mission tactics in the Franco–German War led to mixed conclusions. On the one hand it was appreciated that an increased autonomy of commanders at all levels of the chain of command could be very useful. On the other hand it transpired that this autonomy could have potentially dangerous and chaotic disintegrative side-effects.[59] When the later Chief of the Great General

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50 Verdy, *Studien*, pp. 5–6. For modern literature on the history of mission tactics see first of all Stephan Leistenschneider, *Auftragstaktik im preußisch-deutschen Heer 1871–1914* (Hamburg, 2002); see also Jochen Wittmann, *Auftragstaktik – Just a Command Technique or the Core Pillar of Mastering the Military Operational Art?* (Norderstedt, 2012).
51 Verdy, *Studien*, pp. 7, 14.
52 Leistenschneider, *Auftragstaktik*, p. 90.
53 Leistenschneider, *Auftragstaktik*, p. 42; see also Jochen Wittmann, *Auftragstaktik*, p. 39.
54 Leistenschneider, *Auftragstaktik*, pp. 83–4.
55 Dirk W. Oetting, *Auftragstaktik. Geschichte und Gegenwart einer Führungskonzeption* (Bonn, 1993), pp. 108–9.
56 Leistenschneider, *Auftragstaktik*, pp. 21, 43–55; see also Oetting, *Auftragstaktik*, p. 90.
57 [Anonymous] *Exerzir-Reglement für die Infanterie* (Berlin, 1888).
58 See Leistenschneider, *Auftragstaktik*, p. 101.
59 Leistenschneider, *Auftrakstaktik*, p. 54.

Staff Albert von Schlieffen looked back at the military events of 1870 he was shocked by 'the unauthorized action and indiscriminate behaviour of lower commanders'.[60] These observations found their way into the *Exerzir-Reglement* of 1888, which not only contained the principles of mission tactics, but also stressed the need to counterbalance pernicious side-effects.[61] Mission tactics could only work when its centrifugal tendencies were countered by a thorough military education that installed a set of cooperative core values.[62] German commanders at all levels (both the tactical and the operational) needed to share what Leistenschneider calls 'a certain homogeneity of thinking'.[63] So the slightly paradoxical upshot is that the more important the *autonomous* accomplishment of missions by individual officers became, the more important it became to engrain them with a *shared* mindset.[64]

The mental unity required for a successful application of mission tactics was installed by a shared didactic experience of joint problem-solving. Officers were trained to reach decisions independently, communicate these decisions clearly to others, and lead their soldiers in the realization of the intentions of their superiors and in cooperation with their fellow officers.[65] Both Verdy's *Studien über Truppen-Führung* of 1873–74 and his *Beitrag zum Kriegsspiel* of 1876 were didactic contributions to the challenges posed by mission tactics. The *Studien über Truppenführung* started with a portrayal of a mock campaign (though, it was clearly inspired by the Austro–German War of 1866) at the level of an entire Prussian army corps, and was followed by the detailed mission of an infantry division. This portrayal thus prefigured the *General-Idee* and the *Aufgabe* ('mission') that was discussed in Verdy's wargame (see above). Officers were asked to stop reading after he had formulated a specific problem; to think of solutions themselves; and then to continue reading and check their solution with Verdy's own solution. An obvious drawback of this method, as Verdy remarked himself, was that the reader could access the solution before he had worked it out by himself.[66] In fact, this limitation of one-sided case studies in the *Studien* of 1873–74 may have stimulated Verdy to create his interactive wargame in the *Kriegsspiel* of 1876, which obviously did not have the same problem. In this way, there is a clear and natural continuity between Verdy's *Truppenführung*, understood as a *static* exercise, and his *Beitrag zum Kriegsspiel*, understood as a *dynamic* exercise in mission tactics.[67]

Wargame designers pointed out that wargames, by their interactive character, modelled the unpredictable character of war, the absence of standard solutions, and the need for officers to use their own judgement; this made wargames eminently suitable as training

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60   Quoted in Leistenschneider, *Auftrakstaktik*, p. 51.
61   *Exerzir-Reglement*, pp. 108–9; see also Leistenschneider, *Auftrakstaktik*, p. 21.
62   Verdy, *Studien*, p. 15
63   Leistenschneider, *Auftrakstaktik*, pp. 94–5.
64   Rudolf Karl Fritz von Caemmerer, *Die Entwickelung der strategischen Wissenschaft im 19. Jahrhundert* (Berlin, 1904), p. 185; see also Bucholz, *Moltke, Schlieffen*, p. 53.
65   Bucholz, *Moltke, Schlieffen*, p. 80.
66   Verdy, *Studien*, p. 1.
67   Meckel, *Studien*, p. 7.

tools for mission tactics.[68] As Verdy observes, wargames helped players to transform mere *knowledge* about the need for autonomous action into *capability* for performing such action.[69] And while this point was made about professional wargames in general (on both the tactical and the operational level), it seemed to favour free wargames in particular. Free autonomous judgement was better served by free rules than by rigid rules, and it is evident that in Germany the future belonged to free wargames.[70] Already in 1875 Meckel expected that an increase in officers that are able to lead a wargame would lead to a reduced need for detailed rules – even although he produced a rigid and not a free wargame himself.[71]

The use of professional wargames in the context of mission tactics became institutionalized in the Prussian and later German Great General Staff under Helmut von Moltke (1800–91), who was its Chief between 1857 and 1888. In his memorandum of 1868 on the conclusions drawn from the war against Austria (*Memoire über die bei der Bearbeitung des Feldzuges 1866 hervorgetretenen Erfahrungen*) and in his famous *Verordnungen für die höheren Truppenführer* ('Instructions for Large Unit Commanders') of 1869, he had already formulated the main concepts of mission tactics.[72] These works did not amount to a coherent military doctrine let alone a textbook, and they were written for a restricted circle. Nevertheless, Moltke used the Great General Staff (amongst other things) as a didactic platform to steep an entire generation of German officers in mission tactics.[73] In conscious opposition to Napoleon, Moltke tried to educate a class of autonomous leaders rather than mere executors of his orders.[74] Wargames, together with manoeuvres, staff rides, lectures, the study of topography, and military history, played an essential role in the curriculum provided to officers of the Great General Staff. Moreover, staff officers disseminated the concept of mission tactics when they rotated to field regiments, where similar media were used increasingly to educate field officers.[75] Moltke himself had played Reiswitz's wargame in 1828, when he was still a lieutenant.[76] In

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68 Meckel, *Anleitung*, pp. 5–22; Mayer, *Studie*, pp. 14–15; Naumann, *Regiments-Kriegsspiel*, p. vii. The link between wargames and mission tacticts was not only made by the game designers themselves, but has also been noted by other authors, e.g. Altrock, *Kriegsspiel*, pp. 8–11; Bucholz, *Moltke and the German Wars*, p. 59; Gerhard Groß, *Mythos und Wirklichkeit. Geschichte des operativen Denkens im deutschen Heer von Moltke d.Ä. bis Heusinger* (Paderborn, 2012), pp. 40–1.

69 Verdy, *Studien*, p. 14.

70 Meckel, *Anleitung*, pp. 6, 47, 59.

71 Meckel, *Anleitung*, pp. 6, 47, 59; see also Zipser, *Anleitung*, p. 1; and Young, *Survey*, p. 76.

72 On Moltke and the Great General Staff see Groß, *Mythos und Wirklichkeit*, pp. 29–60; on Moltke and games and mission tactics see also Eberhard Kessel, *Moltke* (Stuttgart, 1957), pp. 428–30, 449; Bucholz, *Moltke, Schlieffen*, pp. 1–108; Bucholz, *Moltke and the German Wars, 1864–1871* (Houndmills, 2001), pp. 33–6, 156–9.

73 Leistenschneider, *Auftragstaktik*, pp. 54–62.

74 Caemmerer, *Entwickelung*, p. 134.

75 Caemmerer, *Entwickelung*, p. 207; Bucholz, *Moltke, Schlieffen*, pp. 30, 32–8.

76 [Theodor Troschke], 'Zum Kriegsspiel', *Militär-Wochenblatt* 35 (1869), pp. 276–7 (276).

1837, when stationed in Constantinople, he taught the game to the Ottoman commander Chosref Pasha.[77] And when he was Chief of Staff to the Fourth Prussian Corps, his Magdeburg Club ranked first in 1844 – although the club of the Prussian Guard Artillery was also a force to be reckoned with.[78]

So far, we have seen how significant wargames were for mission tactics and how both were embraced by the Great General Staff under Moltke. Let us now zoom out to a wider context that is equally relevant for both wargames and mission tactics.

Wargames and Mission Tactics: Incubation, Rifles, and Railways

Prussia's crushing defeat during the twin battles of Jena–Auerstedt in 1806 caused its extensive territorial losses, brought the remainder of the kingdom in the French sphere of influence, and energized a reform movement that sought to regenerate the Prussian state (often against the suspicions of Napoleon or the vacillations of the Prussian King Frederic William III himself). The Prussian reform movement had a political, educational, social, and economic agenda, but in many ways these aspects were instrumental for a goal that was ultimately military: a victory that would end French domination.[79] Perhaps the most important military reformer was Gerhard von Scharnhorst (1755–1813).[80] In 1807 he became head of the Military Reorganization Commission that undertook the difficult task of reforming an ossified Prussian army into an organization that was able to withstand the torrent of Napoleonic warfare.[81] In this role he was instrumental in the creation of a permanent Great General Staff. Also, following Napoleonic custom, he oversaw the division of the amorphous Prussian army in distinct army corps, which in turn were divided into separate divisions, thus creating independent units that could be used for missions under autonomous direction. At the tactical level Scharnhorst inspired a *Vorläufige Instruction für die Uebung der Truppen* (1808) ('Preliminary Instruction for the Exercise of Troops') that created the formation of special skirmishers, who were supposed to act with more flexibility than other parts of the Prussian infantry. According to the *Instruction*, skirmishers should be trained in order to fulfil their missions, but *how* they were trained should be left to the discretion of their officers.[82] Finally, Scharnhorst was the founding father of the Akademie für junge Offiziere der Infanterie und Kavallerie (1801) ('Academy for young infantry and cavalry officers'), the direct precursor of the Kriegsakademie (1810), with a curriculum that stressed critical thinking rather than

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77   Bucholz, *Moltke, Schlieffen*, p. 30.
78   Trotha, *Anleitung*, p. v; Young, *Survey*, p. 22; Bucholz, *Moltke, Schlieffen*, p. 30.
79   Leistenschneider, *Auftragstaktik*, p. 29; see also Walter, *Preußische Heeresreformen*, pp. 235–324.
80   Max Lehmann, *Scharnhorst*, 2 vols (Leipzig, 1887), I:83–4.
81   David Ian Hall, 'The Modern Model of the Battlefield Tour and Staff Ride: Post-1815 Prussian and German Traditions', *The Quarterly Journal* 3 (2002), pp. 96–7.
82   *Instruction* quoted in Lehmann, *Scharnhorst*, p. 154; see also Heinz Stübing, *Scharnhorst. Die Reform des preußischen Heeres* (Göttingen, 1988), pp. 65–91.

procedural knowledge. In this way, Scharnhorst's measures provided the organizational and institutional space for what at this stage was merely a proto-concept of mission tactics.[83] We have no proof that at this early stage he articulated views about the use of wargames for this proto-concept – even although Scharnhorst himself may have introduced wargames in his lessons on tactics and strategy.[84] Moreover, before wargames and mission tactics could really be integrated, Napoleon was defeated (1815), and the enthusiasm for reform in Prussia plummeted. In the post-Napoleonic decades we see many wargames meeting a fate that is typical for devices that are introduced with official sponsorship, but without much subsequent understanding of their use: they ended up in a cupboard. Similarly, in this period we see the introduction of a training and exercise regulation (*Exerzier-Reglement*) for the infantry in 1847 that was 100 pages longer than the regulation adopted during the crisis of Napoleonic domination. This regulation focused on mindless drills rather than real combat training, and hence it was a well-regulated step backwards viewed from the desiderata of mission tactics.[85]

While Scharnhorst primarily contributed to an early *institutional* environment, his pupil Carl von Clausewitz (1780–1831) provided an early *conceptual* basis for the eventual success of mission tactics.[86] In 1805 the young Clausewitz wrote a devastating review of the work of Adam Heinrich Dietrich von Bülow (1757–1807) and his optimistic views about the possibilities of a science of war that took into account only physical, mechanical, and geometrical factors.[87] The obsolete *Schematismus* of eighteenth-century Prussian doctrine was decisively shattered in 1806 on the fields of Jena and Auerstedt; and Clausewitz – who was taken prisoner during that campaign – set out to develop a new military philosophy. In *On War* he explained that military theory should have a practical character that teaches officers to think critically about how to connect specific means with specific ends. This practical theory was meant 'to educate the mind of the future commander, or, more accurately, to guide him in his self-education, not to accompany him to the battlefield'.[88] Young officers should become familiar with this way of

83   Lehmann, *Scharnhorst*, pp. 217–19.
84   See Hajo Holborn, 'The Prusso-German School: Moltke and the Rise of the General Staff', in Peter Paret, ed., *Makers of Modern Strategy. Military Thought from Machiavelli to the Nuclear Age* (Princeton, 1986), pp. 281–95 (283). The game in question was not necessarily the one by the older Reiswitz; in a letter of 8 September 1801 to Knesebeck (Gerhard von Scharnhorst, *Private und dienstliche Schriften. Vol. 3: Lehrer, Artillerist, Wegbreiter*, ed. Johannes Kunisch (Köln, 2002), pp. 59–60), Scharnhorst recommended Georg Venturini (1772–1802), who designed a professional wargame in 1798 that was reprinted in 1804 – see also Schuurman, 'Models of War', pp. 450–1.
85   Leistenschneider, *Auftragstaktik*, pp. 36–7.
86   Azar Gat, *A History of Military Thought from the Enlightenment to the Cold War* (Oxford, 2001), p. 151.
87   Carl von Clausewitz, 'Bemerkungen über die reine und angewandte Strategie des Herrn von Bülow oder Kritik der darin enthaltenen Ansichten 1805', in *Verstreute kleine Schriften*, ed. W. Hahlweg (Osnabrück, 1979), pp. 65–88.
88   Carl von Clausewitz, *On War*, ed. Michael Howard and Peter Paret (Princeton, 1984), II:2, 141.

thinking through a close study of military history. Historical case studies should be used as a form of vicarious learning that allowed the student to relive the decisions of great generals and that amounted to what Jon Tetsuro Sumida has called a 'form of psychological reenactment'.[89]

Since Clausewitz's idea of a military theory amounted to autonomous and critical thinking in terms of means to be used for ends to be attained, it is not difficult to see the relevance of his military thought for the subsequent development of the concept of mission tactics.[90] But here again, as in the case of Scharnhorst, we first observe a period of static incubation. The end of this period was again formed by the start of the 'new era' around 1860. Between the posthumous publication of *On War* in 1832–34 and the 1860s Clausewitz was increasingly mentioned but little read.[91] More specifically, it is difficult to detect his influence on wargames published before the 1860s. This is not surprising, since Clausewitz had little to say about wargames themselves and what he did write – which can be found in a draft for *On War* – was actually highly critical. In this manuscript the objects of his criticism were late eighteenth-century wargames whose chess-like character constituted the very epitome of a mechanistic way of thinking about warfare.[92] Yet, in the works of wargame designers from the 1870s onwards he becomes a clearly detectable influence. For example, in *On War* Clausewitz explained that various factors conspire to make the study of war actually a highly problematic venture: war is driven by complex psychological forces; these forces tend to interact; military action is hampered by all kinds of friction; and action has to proceed in a state of twilight due to a constant lack of information.[93] We have already seen how similar observations would later be used by Meckel and Verdy to underpin the relevance of both wargames and mission tactics (see above). In addition, the idea of warfare as a practical art as formulated by Meckel (see above) has clearly Clausewitzian overtones. Finally, in some cases we even find explicit references to Clausewitz, for instance when Meckel explains how wargames can help officers train their powers of swift and independent decision-making in spite of various forms of friction.[94]

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89   Jon Tetsuro Sumida, *Decoding Clausewitz. A New Approach to On War* (Lawrence, Kansas, 2008), p. 100. See also Caemmerer, *Entwickelung*, pp. 58–61, 204–6; and Paul Schuurman, 'What-If at Waterloo. Carl von Clausewitz's Use of Historical Counterfactuals in his History of the Campaign of 1815', *Journal of Strategic Studies* 40 (2017), pp. 1016–38 (1030).

90   For Clausewitz's influence on Moltke see Caemmerer, *Entwickelung*, p. 68; and Hew Strachan, *Clausewitz's On War* (New York, 2007), pp. 10–14.

91   Werner Hahlweg, 'Das Clausewitzbild einst und jetzt', in Carl von Clausewitz, *Vom Kriege* (Bonn, 1972), p. 55.

92   Carl von Clausewitz, 'Niederschriften des Werkes "Vom Kriege", 1. Ältere Fassung. Entwürfe', in *Schriften–Aufsätze–Studien–Briefe. Dokumente aus dem Clausewitz-, Scharnhorst- und Gneisenau- Nachlaß sowie aus öffentlichen und privaten Sammlungen*, ed. (Göttingen, 1990), Werner Hahlweg, II:2, 655.

93   Clausewitz, *On War*, II:2, 140; II:3, 149; Schuurman, 'What-If', p. 1029.

94   Meckel, *Studien*, pp. 13–14; see also Trotha, *Anleitung*, pp. 1–2; and Bucholz, *Moltke, Schlieffen*, p. 85.

So, it was only during the Wars of Unification that *mission tactics* were actually applied, while the concept was developed more systematically in the subsequent decade; and it was only from this time onwards that *wargames* became a widespread training device. Let us now concentrate on the technological context for this twin development. This context was of a much more massive and brutal nature than either Scharnhorst's institutional work or Clausewitz's conceptual work. One very important context was formed by the dramatic increase in firepower in the course of the nineteenth century. Comparing rifles at the end of the nineteenth century with rifles used during the Napoleon war, Rudolf Karl Fritz von Caemmerer observed how their reach had increased fivefold, how their fire frequencies had tripled, and how the rapidity and accuracy of artillery fire had increased as well.[95] Various innovations contributed to this effect, including the replacement of muzzle-loaded firearms by breach-loaded firearms.[96] When German infantry soldiers attacked in conventional rigid columns in the war of 1870–71, they were mowed down by the murderous fire of French *chassepot* rifles; and cavalry charges against firing infantry did not fare much better.[97] The German army was taught the harsh lesson that its soldiers should disperse in the face of increased firepower, making flexible use of the possibilities of the terrain under the autonomous initiative of local commanders.[98] This is how the actual *practice* of mission tactics, in addition to just its *concept*, was brought to life in deadly combat fire; and this is why mission tactics had the improvised character mentioned earlier (see above).

Since the dramatic effect of increased firepower during the German wars stimulated mission tactics, which in its turn stimulated the use of wargames, it is not surprising that we see specific efforts to include the effects of firepower in wargames in the 1870s, when German game designers started to digest the lessons from spectacular victories – victories that had not only surprised Europe but also the Germans themselves.[99] We have already seen how Meckel advocated a more realistic use of dice and combat tables with his step-by-step battle resolution approach (see above). When he advocated the use of tables in this way, he very much tried to model the enormous and often non-linear impact of modern long-distance fire.[100] Was the firing unit placed in a favourable position? Had it recently rushed to its position or was it amply rested? Was it firing in an open or closed formation? What was the nature and the distance of the object that was subjected to fire? In addition to these physical considerations, Meckel also took into account psychological factors. Was the unit firing under fire itself? Was it surprised by the fire of a swiftly approaching opponent? Was it suffering from increasing stress during a long exchange of fire?

Meckel tried to assign quantitative values to these factors, and the flood of military publications in the 1870s provided him with a treasure trove of statistical information about the performance of the latest firearms during the Germans wars. While these points

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95   Caemmerer, *Entwickelung*, pp. 135–6; see also Verdy, *Studien*, p. 11.
96   Walter, *Preußische Heeresreform*, pp. 130–7, 587–92.
97   Mayer, *Studie*, p. 72.
98   Leistenschneider, *Auftragstaktik*, pp. 54, 73, 79–82.
99   See Walter, *Preußische Heeresreform*, pp. 18–22; and Clark, *Iron Kingdom*, pp. 551–2.
100   Meckel, *Studien*, pp. 29–30.

Infanteriefeuer.
Feuerwirkung eines Zuges Infanterie. — Dauer des Feuers: ein Zug (2½ Minuten).
60 Points Verlust repräsentiren bei der Infanterie die Stärke eines Zuges, bei der Kavallerie die einer Eskadron, bei der Artillerie die Feuerkraft von 2 Geschützen.

Anlage 1.

Ziel.	Entfernung in Metern.	Geringste Wirkung.	Schlechte Wirkung.	Mittlere Wirkung.	Gute Wirkung.	Beste Wirkung.

(Figure 2 — a detailed combat result table of numeric values arranged under the five "Wirkung" columns, for targets Schützen, Geschl. Infant., Artillerie, Kavallerie at ranges: bis 100, 100 bis 200, 200 bis 300, 300 bis 400, 400 bis 500, 500 bis 600, 600 bis 700, 700 bis 800, 800 bis 1000, Ueber 1000.)

Figure 2. A detailed Combat Result Table, taken from Meckel, *Zum Kriegsspiele. I. Theil Direktiven für das Kriegsspiel*, appendix 1 (no page number provided) (Berlin, 1875)

had driven his *criteria* for an improved wargame in his *Studien* of 1873 (see above), the *Kriegsspiel* of 1875 was his attempt to produce a game that actually *applied* these criteria. The result was a complex combat resolution table as shown in Figure 2. This table was designed to assess realistic combat outcomes in various detailed situations.[101] The effect of 2.5 minutes of fire by an infantry platoon is given for different targets at different distances, for example against cavalry at a distance between 400 and 500 meters. In addition, before a dice is rolled to assess the losses of the targeted cavalry, a choice must be made between five columns with different statistical bandwidths for different throws of the dice: smallest effect, small effect, medium effect, great effect, and greatest effect. In the case mentioned here, that is fire against cavalry between 400 and 500 meters, the bandwidth for the smallest effect is 5 hits on a roll of 1, increasing to 20 hits on a roll of 6; while the greatest effect gives 60 hits on a roll of 1, increasing to 120 hits on a roll of 6.[102]

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101   See also Mayer, *Studie*, p. 17; Bucholz, *Moltke, Schlieffen*, p. 87.

102   Meckel was not the only game designer who tried to factor in the increased effect of fire-power. When Edmund Edler von Mayer presented the rules for his new wargame in 1874, he also stressed the importance of the devastating effect of breach-loaded rifles. See Mayer, *Studie*, p. 19; see also p. 3; Naumann, *Regiments-Kriegsspiel*, pp. 40–1; but compare Mayer, *Studie*, p. 26.

Increased firepower was not only considered something that should and could be modelled in a wargame, it was also used to provide legitimacy for using a professional wargame in the first place. Verdy noted that, given the destructive force of modern rifles and artillery, bravery without wits no longer sufficed. Increased firepower brought in its wake increased demands to the intellect of commanders.[103] And this is where his wargame could play a vital role. In this way, increased firepower stimulated the addition of the new medium of the wargame as a training device by proxy, in addition to the traditional medium of books on military history.[104]

So much about the importance of increased firepower for mission tactics and hence for wargames. Another context for the adoption of mission tactics in the 1860s was partly demographical and partly again technological; and here again we see a connection between mission tactics and wargames – more specifically, we see how wargames provided *solutions* for *challenges* created by mission tactics. In the decades after the Napoleonic wars the effect of population growth in Prussia meant that more youths were reaching military age. Accommodating these masses into the conservative structures of the Prussian army was an operation fraught with political problems and was at the heart of a constitutional crisis of 1862, but the results of military reform, pushed by demographic opportunities and international exigencies, were dramatic.[105] It has been estimated that in the few years between 1864 and 1871, the annual number of soldiers mobilized by Prussia increased 1,500 per cent, and that in terms of space used by the advancing army there was an increase of about 1,000 per cent.[106]

Moreover, in the 1850s Germany crossed the dividing line between a pre-industrial and an industrial form of economy. Around 1850 the Prussian state started to actively sponsor and use railroads for military purposes, which may have quadrupled the speed of movement. The combined result was a large army that could be transported swiftly over large distances. In addition, thanks to railroads the nation's vast sources of manpower, food, and equipment could be tapped. In the words of Rudolf von Caemmerer, railways made the country 'a single magazine with separate storerooms'.[107]

At the same time, these new possibilities brought new problems. Given the limited transport capability of any single railroad, the use of this fast mode of transport tended to favour movement in broad spaces. Hence the individual corps of the army could only be amassed together for battle in the last stages of their movement; Moltke's use of the concept 'March Divided, Fight United' was the fruit of these logistical challenges, and this motto was brilliantly brought into practice against the Austrians during the battle of Sadowa in 1866.[108] In his 1869 *Instructions for Higher Commanders* Moltke clearly

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103   Verdy, *Studien*, 'Vorwort', pp. i–ii.
104   See also Mayer, *Studie*, p. 7.
105   T.N. Dupuy, *A Genius for War. The German Army and General Staff, 1807–1945* (Fairfax, Virginia, 1984), p. 51.
106   Bucholz, *Moltke, Schlieffen*, p. 54.
107   Caemmerer, *Entwickelung*, p. 128; see also Walter, *Preußische Heeresreformen*, pp. 124–8, 579–83.
108   Kessel, *Moltke*, pp. 429–30.

connects the motto with an increase of scale; and within a single page he draws a conclusion from this increase of scale that implies the use of mission tactics: 'There are many situations in which an officer should act in accordance with his insight. It would be very wrong to wait for orders when none can be given.'[109]

So, the result of mechanized mass warfare with the help of railways had the same effect as increased firepower, that is, spatial extension. Spatial extension caused by firepower took the form of dispersal on the tactical level of separate combats, while in the case of railway movement, extension took place on the operational level of entire army corps – and on this level extension was followed by concentration. On both levels of extension, the result was roughly the same: a reduced attention for procedures and an increased latitude for local commanders to chose the means that allowed them to accomplish the aims formulated by their superiors. Moreover, just as mission tactics stimulated by increased firepower on the *tactical level* demanded integrative devices, so did mechanized warfare on the *operational level*. Here again, wargames (along with staff rides and manoeuvres), played a vital integrative role. The need to install a shared mindset through the use of wargames existed both on the tactical and on the operational levels.

Finally, while the technological invention of railroads amplified the *disintegrative* tendencies of mission tactics, the invention of the telegraph clearly had an *integrative* effect. In 1904 Rudolf von Caemmerer would enthusiastically write that the telegraph 'has completely removed the dangers of [spatial] separation'.[110] Interestingly enough, though, the Great General Staff did *not* try to use the telegraph to micro-manage operations. The telegraph was in no way used to supplant either mission tactics or wargames. Actually, the Great General Staff took an active interest in integrating the telegraph in its mission tactics. The telegraph was not only used for swift communication between the Great General Staff and corps commanders, but also *between* corps commanders, who could thus continue to perform in the autonomous modus operandi demanded by mission tactics; and these cooperative operations needed *more* rather than *less* training by playing professional wargames.[111]

Conclusion

The first Prussian wargames were born in the aftermath of Prussia's crushing defeats at the hands of Napoleon in 1806. In the first decades of the nineteenth century Scharnhorst and

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109 Helmuth von Moltke, 'Aus den Verordnungen für die höheren Truppenführer', *Taktische-strategische Aufsätze aus den Jahren 1857 bis 1871* (Berlin, 1900, reprint London, 2018), pp. 165–215 (173, 174); see also pp. 179–82; Bucholz, *Moltke, Schlieffen*, p. 41; Leistenscheider, *Auftragstaktik*, p. 79. Moltke allowed large freedom for his corps commanders to achieve his aims. This *Führen durch Direktiven* ('leadership by directive') was also known as *Auftragsverfahren* ('misson method'); see Dupy, *Genius for War*, pp. 51–2; Bucholz, *Moltke, Schlieffen*, p. 56; Walter, *Preußische Heeresreformen*, pp. 546–7. Moltke's own use of *Autragsverfahren* on the level of army corps was consistent with his general support for *Auftragstaktik* on all levels; see Moltke, 'Truppenführer', p. 180; Leistenschneider, *Auftragstaktik*, p. 60; cf. Oetting, *Auftragstaktik*, pp. 103–19.

110 Caemmerer, *Entwickelung*, p. 133; see also Walter, *Preußische Heeresreformen*, pp. 128–30, 583–6.

111 Caemmerer, *Entwickelung*, pp. 134, 137; see also Bucholz, *Moltke, Schlieffen*, p. 83.

Clausewitz provided the institutional and conceptual space for the eventual development and introduction of mission tactics; but both wargames and mission tactics first went through a period of latency. Wargames were introduced by the state, but their actual use stagnated in post-Napoleonic Prussia. Similarly, the year 1847 saw the instruction of an exercise regulation that did not introduce mission tactics but moved away from that concept. A more complete concept of mission tactics was developed in Moltke's Great General Staff from the 1860s onwards, while its actual improvised introduction took place under the fire of French *chassepot* rifles in the war of 1870–71, which favoured dispersal of troops under fire. Dispersal favoured mission tactics, which carried disintegrative risks. These risks were countered by a host of integrative training devices, of which professional wargames were an essential part. Similarly, on the operational level, the use of railways for the swift deployment of entire army corps favoured initial dispersal (followed by subsequent concentration). Dispersal on this level again encouraged mission tactics, which carried the risk of disintegration. This danger was again countered by wargames. The development of professional wargames and the proto-concept of mission tactics after Prussia's defeats in the Napoleonic wars initially had a precarious character. But once a firm link had been established between leading by mission tactics and training for leadership by wargames in the 1870s, mission tactics and wargames jointly spiralled upwards to increased levels of effectiveness. Constantin von Altrock was right when he boasted in 1908, 'Happily enough it can be established that on the fields of *military leadership* and *wargames* the German army doubtlessly marches ahead.'[112] Professional wargames and mission tactics were both *hesitant consequences* of Prussian defeat during the Napoleonic wars; they were both *substantial consequences* of the Prussian victories during the German wars; and they may have been *significant joint contributors* to Germans military success during the First and Second World War – but that is the subject of another study.

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Author Biography

Paul Schuurman works as Associate Professor in the history of philosophy at Erasmus University Rotterdam, The Netherlands; he has published on the logic, metaphysics and epistemology of Descartes and Locke, and is currently engaged in a research project on war in the history of ideas between 1650 and 1900, with publications on Pieter de la Court (1618-1685), François Fénelon (1615-1715), Montesquieu, Clausewitz, Napoleonic wargames, and Herbert Spencer.

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112   Altrock, *Kriegsspiel*, p. iv (italics added); see also Bucholz, *Moltke, Schlieffen*, pp. 1–2.