



The Education of the Enlightened Soldier

Bruce Gudmundsson

In 1989, General Alfred M. Gray Jr., then serving as Commandant of the U.S. Marine Corps, founded the Marine Corps University, promulgated the Commandant's Reading List and, by means of the first edition of *Warfighting*, Fleet Marine Force Manual (FMFM) 1, made maneuver warfare the cornerstone of formal doctrine. That same year, an obscure academic press published a book called *The Enlightened Soldier: Scharnhorst and the Militrische Gesellschaft in Berlin, 1801–1805*.¹ At first glance, the appearance of a scholarly monograph on the subject of four years of the peacetime achievements of a bookish, somewhat tongue-tied officer who, in a time long past, had served a country that, as of 1989, had not existed for 70 years, seems to have been entirely unconnected to the great reforms of the “Quantico Renaissance.” However, in the 29 years that have passed since its first appearance in print, *The Enlightened Soldier* has enjoyed remarkable popularity within the Marine Corps. In that period, the *Marine Corps Gazette* has published 13 articles in which American Marines point to the eponymous protagonist of that book, Gerhard David Scharnhorst (1755–1813), as both a paragon of military professionalism and a major contributor to the tradition of maneuver warfare. Indeed, the fact that 10 of these articles have appeared in the last decade suggests that interest in that work may even be on the rise.²

The purpose of this article is to provide readers of *The Enlightened Soldier*, both past and future, with information that will complement the material made available by that work. In particular, it will provide a brief description of a period that is largely ignored in the (extraordinarily sparse) English-language literature that deals with Scharnhorst's life: the first 10 years that he spent in

Between 2007 and 2017, Bruce Gudmundsson held the Case Method Chair at Marine Corps University. He is currently writing a book about the history of the use of decision games in professional military education.

uniform. As Scharnhorst spent this decade, which began in 1773 and ended in 1782, as either a student or a junior teacher, the focus of this narrative will lie squarely on his experience of formal schooling. More specifically, it will deal with the experiences that set up the creative tension at the heart of the remarkable accomplishments of his later life, whether as a teacher, a reformer, or a staff officer in the field. In other words, this article will provide an overview of the experiences that helped Scharnhorst cultivate his powers of systematic preparation, careful analysis, and scientific inquiry as well as those that fostered his ability to improvise, synthesize, and exploit fleeting opportunities.

Gerhard David Scharnhorst was born on 12 November 1755 in the little town of Bordenau in what was then the Electorate of Hanover, which was at the time one of the largest of the 300 or so component states of the Holy Roman Empire.³ His father, Ernst Wilhelm Scharnhorst, was what his English-speaking contemporaries would have called a “yeoman farmer.”⁴ That is, for much of his life, he employed several laborers to help him run a substantial farm that he leased from a landlord. Later, a substantial inheritance enabled him to own the land that he managed. Before taking up farming, the senior Scharnhorst had served as a trooper, noncommissioned officer, and quartermaster in a cavalry regiment of the Hanoverian Army, seeing active service in the War of Austrian Succession (1740–48). The economic standing of the Scharnhorst family was such that it could afford to send its children to village schools, where they acquired the rudiments of reading, writing, and arithmetic. Beyond that, however, they were left to their own devices.⁵

Scharnhorst would later describe the technique that he employed to learn how to spell—a task that was complicated by the difference between the broad dialect of German that he spoke and the standard version of that language.⁶

Here is my method. I have experienced very little in the way of formal instruction. In order to learn how to spell, each day I asked [one of] my siblings to dictate a page from my reader. I then corrected what I had written, and marked [in pencil in the book] any word that I had spelled incorrectly. The next day, I reviewed the words that I had marked. If I failed to remember the mistakes that I had made, I marked the word a second time. This was an indication that I should revisit the word before I went any further. In this way, I made steady progress. By the time I reached the fifth page of the book, I was able to spell all the words correctly the first time that they were dictated to me, with the only exception being terms of art that were new to me.⁷

In April 1773, when he was 17 years old, Scharnhorst entered the mili-

tary academy that Count William, ruler of the small but sovereign state of Schaumburg-Lippe, had recently established on the island fortress of Wilhelmstein.⁸ There he served first as an apprentice gunner, then as a noncommissioned officer, and finally as a warrant officer, in the tiny Artillery and Engineer Corps of Count William's minuscule army.⁹ As this unit also provided Wilhelmstein with its garrison—the military academy with its “school troops” and Schaumburg-Lippe with its military engineers—this service gave Scharnhorst firsthand knowledge of the many arts practiced by the gunners and sappers of his day.¹⁰ Moreover, thanks to Count William's passion for experimentation, Scharnhorst enjoyed many opportunities to participate in attempts to improve the science of gunnery, methods of gun founding, and various aspects of the technique of siege warfare.

When not performing their purely military duties, the students at Wilhelmstein followed an academic curriculum that made extensive use of what would now be called the “tutorial method.” Each of the tutors—who were chosen from among the “cleverest” of the officers of the Artillery and Engineer Corps—would guide the students in their charge through a program of assignments. These, depending on the subject, might take the form of essays to write, maps or diagrams to draw, translations to make, mathematical problems to solve, or theorems to prove. To explain new assignments, review work submitted, and evaluate progress, the tutors met with their students on a regular basis. Ideally, a student would attend these meetings in the company of a fellow student who was working through the same series of assignments at the same time. However, as the student body was small and composed of young men who had begun their studies at many different times, and with varying degrees of preparation, there were many occasions when tutors met with individual students.¹¹

Solitary study occupied four of the six days of the standard academic week at Wilhelmstein. In particular, Mondays, Tuesdays, Thursdays, and Fridays were set aside for meetings with tutors and the completion of projects assigned by tutors. On Wednesdays and Saturdays, students gathered in the library of the fortress, where they divided their time between group classes and self-directed study. According to Count William's initial conception of the academic calendar, the group classes were to take place in the morning, leaving the afternoons free for the perusal of books, instruments, manuscripts, maps, and models. However, surviving descriptions of particular periods of instruction indicate that some group classes were held in the afternoon.¹²

The topics for tutorials and group classes, as well as the materials made available for self-directed study, belonged chiefly to the realm of science, technology, engineering, and mathematics. Even the study of living languages, which would today fall into the category of the humanities, consisted largely (though not exclusively) of making translations from works in French and English on such

subjects as ballistics, shipbuilding, mathematics, and siegecraft.¹³ Moreover, while Count William charged tutors to view the curriculum he prescribed as nothing more than a starting point for a broader exploration of the subjects in question, he also forbade them to devote time to the teaching of such mainstays of Enlightenment education as philosophy, metaphysics, and rhetoric.¹⁴

In 1778, Scharnhorst returned to Hanover, where he accepted a commission in the 8th Cavalry Regiment, the unit in which his father had previously served.¹⁵ The colonel of this regiment, Emmerich d'Estorff, had much in common with Count William. Both were aristocrats, members of a land-owning warrior elite who had from birth been trained for lives of leadership, service, prerogative, and privilege. Both were cosmopolitans, well-read, well-travelled polyglots who participated fully in the international high culture of the day. In each man, moreover, these seemingly disparate sets of characteristics combined to create a powerful, pervasive, and persistent passion for military education.¹⁶

The common elements in the visions for military education of Count William and d'Estorff included an appreciation for the value of reflective reading, the conviction that the study of the military arts and sciences ought to be nested within a framework of broad general culture, and belief in what might be called the "unity of the art of war." That is, neither Count William nor d'Estorff viewed the various levels of war as distinct phenomena, the study of which was reserved for persons holding particular positions in the military hierarchy. Instead, both encouraged an integrated approach to the study of war in which techniques were taught (or tested) within the context of tactical situations, plans of campaign, strategic settings, political goals, and philosophical ideals.¹⁷

The approaches to military education of Count William and d'Estorff were not, however, identical. Each embraced a different vision of both the ethical basis for going to war (*jus ad bellum*) and the right way to conduct a war (*jus in bello*). These visions shaped the choices that each man made: the policies that he preferred, the strategies that he studied, the campaigns that he contemplated, the battles that he imagined, and the techniques that he added to his tool box. These things, in turn, had a profound effect on the curriculum each man crafted and the teaching methods he employed.

For Count William, the only just war was one that used defensive means to serve defensive purposes.¹⁸ Thus, the centerpiece of his plan for responding to an invasion of Schaumburg-Lippe was the use of the fortress of Wilhelmstein as a personal headquarters, a base for the operations for his tiny army, and a symbol of resistance. This, in turn, meant that a favorable outcome to any war depended entirely upon the skill with which Count William and his men resisted attempts to take the fortress. In other words, the military arts and sciences of greatest interest to Count William, and thus those that loomed largest in his program of instruction, were those of the engineer and the artillerist. Likewise,

the branch of the art of war of greatest importance to Count William's strategy, and thus the one that played the greatest role in the studies of his students, was siegecraft.

Toward the end of the seventeenth century, the art of taking a fortress had been reduced to a series of stock solutions applied in a highly predictable fashion during the course of several weeks. At the same time, the art of defending a fortified place had also become an entirely conventional affair in which each measure taken by an attacker had its match in a well-established countermeasure. By the time Count William established his academy, moreover, the widespread publication of the works of the authors of these practices (the most famous of whom was Sébastien de Prestre de Vauban) and their many imitators ensured that detailed descriptions of the component conventions of contemporary siegecraft were widely available.¹⁹

The many innovations undertaken by Count William took place within the confines of the conventions of eighteenth-century siege warfare. This was as true for revolutionary enterprises, such as the attempt to build a submarine to operate in the waters around Wilhelmstein, as it was for undertakings aimed at marginal improvements, such as the refinement of the canister rounds fired by various types of canons and new designs for field fortifications. It also applied to innovations that fell somewhere between these two categories, the most notable of which was an attempt to optimize the organization, armament, and drill of the infantry of the garrison of Wilhelmstein for the defense of the walls, bastions, and outworks of that place.²⁰

The various components in Count William's scheme for defending his little country had their counterparts in the curriculum of his academy. Thus, his program of instruction—or, to be more precise, his program of study—included boatbuilding, ballistics, and, to give students access to the most important contemporary literature on those subjects, plenty of practice in translating technical texts written in English. Similarly, the cadets at Wilhelmstein devoted a lot of time to the exploration of books about siege warfare, military architecture, and military engineering. As these were largely in French, much effort was also devoted to learning that language. Schaumburg-Lippe was an ally of Great Britain, and French was the language of elite culture, diplomacy, and military command throughout Europe. Thus, the study of English and French provided students with important secondary benefits as well. All of the technical subjects studied at Wilhelmstein rested on mathematical foundations. Therefore, whatever else they were doing, Count William's cadets could often be found pondering problems of a decidedly quantitative character.

The tempo of the work at Wilhelmstein, whether academic or practical, was also in keeping with the central role that defensive fortress warfare played in the plans, policy, and philosophy of Count William. For operations of this

kind, a successful outcome depended more on the preparations made in time of peace than on quick decisions made in the course of highly dynamic situations. Indeed, in the event of a conflict, the small number of issues that required rapid resolution would, for the most part, lie within the personal purview of the commander in chief, that is, Count William. Thus, it is far from surprising that Count William gave his cadets a great deal of practice in solving well-defined problems in a creative, systematic, and methodical way but few, if any, tasks that fostered their ability to act quickly and decisively in novel, ambiguous circumstances. In other words, Count William's curriculum provided him with officers who, while exquisitely well-schooled in siegecraft and gunnery and powerfully inclined to improvement, invention, and even innovation, were largely innocent of the arts of immediate improvisation and intuitive decision making.

While every bit as mindful of moral mandates as Count William, Emerich d'Estorff had developed a different view of the ethical imperatives of military policy. For d'Estorff, the chief desideratum was the protection of the population of one's own country from hardships that inevitably resulted from the proximity of armies on campaign. This meant that, whenever possible, d'Estorff wanted to arrange things so that Hanoverian forces operated in the territory of states other than the Electorate of Hanover. That, in turn, meant that Hanoverian soldiers needed to prepare for active service in unfamiliar places. This was particularly true for those, such as the officers, noncommissioned officers, and troopers of the 8th Cavalry Regiment, who could expect to take part in a large number of reconnaissance patrols, raids, and other small-scale enterprises in the intervals between armies.

In d'Estorff's view, the ability of a leader to succeed in the "small war" was dependent on their ability to make, in a very short period of time, an accurate estimate of the tactical possibilities of a particular piece of ground, a faculty that he, like so many of his contemporaries, called by the French *coup d'oeil* (or strike of the eye). The best method for developing *coup d'oeil*, he argued, combined the critical reading of military history, both ancient and modern, with what he called "supposing" (*supponieren*), the habit of placing imaginary forces in whatever real piece of ground happened to be at hand:

An officer who has, out of true passion, dedicated himself in this way to the honorable study of war, each time he goes out for a walk or a ride, instead of looking at things casually, will view them with a military eye. . . . Each village will provide him with a new subject for study, how he will attack it if it is occupied by an enemy, or, if he is using it to quarter his troops, how he will defend it.²¹

Sometime after 1770, d'Estorff commissioned the construction of a large "maneuver table."²² With a length of about five meters, the table represented terrain approximately 30 kilometers long and 15 kilometers wide.²³ Thus, while the ostensible purpose of the table was to allow the officers using it to *suppose* in inclement weather, the extent of the ground depicted suggests that d'Estorff was interested not only in the depiction of battles and engagements but also of the larger context of each clash of arms. The size and scale of the table also suggests that d'Estorff may have been particularly interested in giving his subordinates opportunities to plan routes for raids and reconnaissance patrols.²⁴

D'Estorff also placed a great deal of value on the general education of his officers. In the same memorandum in which he described his technique for cultivating the coup d'oeil, he encouraged them to read books on politics, international trade, and manufacturing, as well as the shorter encyclopedias of the day, which were designed less for reference than for giving readers an overview of a wide variety of topics. Such reading, he argued, would give officers the means of conversing with people of many different walks of life, whether on social occasions or in the course of official travel to foreign lands. D'Estorff encouraged the study of natural history, both from books and in the field. The search for specimens, he noted, provided an officer on leave with an excellent pretext for reconnoitering the environs of a foreign fortress.²⁵

D'Estorff placed particular value on the ability of officers to read French. A substantial proportion of the works on the reading list he provided for them were written in that language.²⁶ He also devoted much care to ensuring that his officers were able to converse in French. Indeed, Scharnhorst reports that, as with the other officers (and, presumably, officer-candidates) of his regiment, he was required to devote many evenings, for a total of 12 hours each week, at an event known as the "French assembly." Supervised by a senior field-grade officer, Major Jakob Niemeyer, this seems to have been a gathering in which the officers were free to discuss any topic they liked but were forbidden to do so in any language other than French.²⁷

Soon after Scharnhorst reported for duty with the 8th Cavalry Regiment, d'Estorff put him to work teaching short courses in mathematics, military engineering, and tactics to cadets and junior officers. In letters written at this time, Scharnhorst complained of the toil and trouble this duty caused him and, in particular, his differences with d'Estorff when it came to teaching methods. D'Estorff, he wrote, "rushes and brushes lightly over things. I prefer to work, so that no one might miss the essentials, according to the deliberate methods of the Count of blessed memory. Naturally, I always finish late."²⁸

In 1782, Scharnhorst published the first issue of a journal called the *Military Library*. The largest article in this issue, accounting for 32 of its 142 pag-

es, was the first half of a two-part piece titled “Introduction to Reading and Field Exercises for Officers.” This article laid out a comprehensive program of book-based self-tuition, not merely in the military arts and sciences but also in mathematics, French, and English.²⁹ The first issue of the *Military Library* also contained a notice explaining that the second half of the article, which was to be published in the second issue of the journal and deal with field exercises, would draw heavily upon an unpublished memorandum on professional education that Emmerich d’Estorff had written for the officers of his regiment.³⁰ If this memorandum is the same document in which d’Estorff describes the use of supposing as a means of cultivating coup d’oeil, it follows that, by 1782, Scharnhorst had learned how to “rush and brush lightly” in the manner of his commanding officer. Unfortunately, Scharnhorst failed to keep either his initial promise to publish the second half of this piece in the second issue of the *Military Library* or his subsequent promise to include it with the third issue of that journal. Thus, one cannot be entirely sure either of the timing or the degree of Scharnhorst’s embrace of d’Estorff’s approach to the teaching of tactics.

In 1782, the same year in which he published the first issue of his *Military Library*, Scharnhorst left the 8th Cavalry Regiment, and thus the regimental school of that unit, to take up a commission in the Artillery Regiment of the Hanoverian Army. The express purpose for this transfer was the employment of Scharnhorst as an instructor in the artillery school that had just been established in Hanover. There, he would make use of what he had learned in two very different military environments to teach an approach to the art of war that made use of both the “slow thinking” of Count William of Schaumburg-Lippe and the “fast thinking” of Emmerich d’Estorff.³¹

While it serves as the only book-length biography of Scharnhorst in English, *The Enlightened Soldier* deals mostly with the protagonist’s role in the establishment of the Military Society of Berlin. As the chief activity of the Military Society was the presentation and publication of papers written by its members, readers of *The Enlightened Soldier* will learn a great deal about the slow thinking element of Scharnhorst’s particular brand of military professionalism, but very little about the role played by fast thinking. Similarly, the other works in English that address the life and work of Scharnhorst, particularly those of Peter Paret and Dennis Showalter, describe his work as a reformer and technologist. In doing so, they also reinforce the bias toward slow thinking.³²

If this article remedies bias toward slow thinking in the Anglophone literature about Scharnhorst, then it will have achieved its purpose. This is not to say that the readers should disparage, denigrate, or discount the role played by formal analysis and systematic synthesis in the teaching methods of the eponymous protagonist of *The Enlightened Soldier*. Rather, the author of this piece hopes that, when they engage the life and work of Gerhard Scharnhorst, readers

will remember that, in addition to being formed by the “deliberate methods” of Count William of Schaumburg-Lippe, he was also shaped by the very different teaching techniques of Emmerich d’Estorff.

Notes

1. Charles Edward White, *The Enlightened Soldier: Scharnhorst and the Militrische Gesellschaft in Berlin, 1801–1805* (New York: Praeger, 1989).
2. The articles from the *Marine Corps Gazette* that make adulatory reference to *The Enlightened Soldier* and its protagonist are Capt Robert N. Ellithorpe, “The Birth of the Professional Officer,” 75, no. 7 (July 1991): 93; Gen Paul K. Van Riper, “The Use of Military History in the Professional Education of Officers,” 78, no. 2 (February 1994): 49–53; Capt Scott A. Cuomo, “Will We Be Prepared for What’s Next?,” 91, no. 7 (July 2007): 9–12; LtCol J. Alex Vohr, “Design in the Context of Operational Art: Is It a Systems Theory-Based Approach?,” 94, no. 1 (January 2010): 39–42; “The Attritionist Letters (#2),” 94, no. 6 (June 2010): 10–11; Col J. Alex Vohr, “Design in the Context of Operational Art: Education Hones Mental Skills Required in War,” 94, no. 10 (October 2010): 16–21; LtCol George C. Schreffler III, “Education and Training: A Proposal for Educating and Training the Company Commander,” 94, no. 10 (October 2010): 30–35; Maj Gregory A. Thiele, “Fourth Generation Warfare,” 97, no. 6 (June 2013): 53–54; LtCol Randall F. Hoffman, “In the Wake of Pete Ellis: Four Challenges that Will Change the Marine Corps in 2015–24,” 97, no. 8 (August 2013): 69–72; Capt James Covey, “The Enlightened Marine: Expand and Tailor the Current Reading List,” 97, no. 9 (September 2013): 34–36; Capt Justin P. Gray, “Supporting the Reawakening: What Company Grade Officers Must Do,” 98, no. 8 (August 2014): 26–28; Capt Daniel R. Grazier, “A Manoeuvre Renaissance: Overcoming the Attritionist Tendency,” 99, no. 6 (June 2015): 57–60; and LtCol Gregory Thiele, “Our Jena-Auerstdt?,” 101, no. 3 (March 2017): 15–19.
3. At the time of Scharnhorst’s birth, approximately 700,000 people lived within the borders of the Electorate of Hanover. That is, while not as large as the Kingdom of Prussia, which had approximately 4.1 million inhabitants, it was 42 times as populous as the County of Schaumburg-Lippe, which had fewer than 17,000 residents. For a discussion of the population of Hanover between 1757 and 1763, see E. Michelsen and F. Niedderich, *Geschichte der Deutschen Landwirtschaft* [History of German agriculture] (Berlin: Paul Parey, 1890), 175. For a thorough examination of the population of Prussia in 1756, see Reinhold Koser, “Zur Bevlkerungsstatistik des preusischen Staates von 1756–1786” [On the population statistics of the Prussian state, 1756–1786], in *Forschungen zur Brandenburgischen und Preusischen Geschichte* [Investigations into the history of Brandenburg and Prussia], ed. Otto Hintze (Leipzig: Dunker und Humblot, 1903), 16:583–89. For details of the population of Schaumburg-Lippe, see Carl-Hans Hauptmeyer, “Die Bauernunruhen in Schaumburg-Lippe 1784–1793” [Peasant unrest in Schaumburg-Lippe 1784–1793], in *Niederschsches Jahrbuch fr Landesgeschichte* [Lower Saxon yearbook for regional history], Band 49 (Hildesheim, Germany: August Lax, 1977), 152.
4. For a thorough description of the farming career of Ernst Wilhelm Scharnhorst and the schooling of his children, see George Heinrich Klippel, *Das Leben des Generals von Scharnhorst* [The life of General von Scharnhorst] (Leipzig: Brockhaus, 1869), 1:10–15.
5. For a characterization of the service of the senior Scharnhorst in the 8th Cavalry Regiment of the Hanoverian Army, see L. von Estorff, *Scharnhorst und Wir* [Scharnhorst and us] (Berlin: R. F. Koehler, 1926), 11, 14.
6. For a discussion of the troubled relationship between Scharnhorst and the standard spoken German of his day, see Andreas Broicher, *Gerhard von Scharnhorst: Soldat, Reformier, Wegbereiter* [Gerhard von Scharnhorst: Soldier, reformer, and pioneer] (Aachen: Helios, 2005), 26.

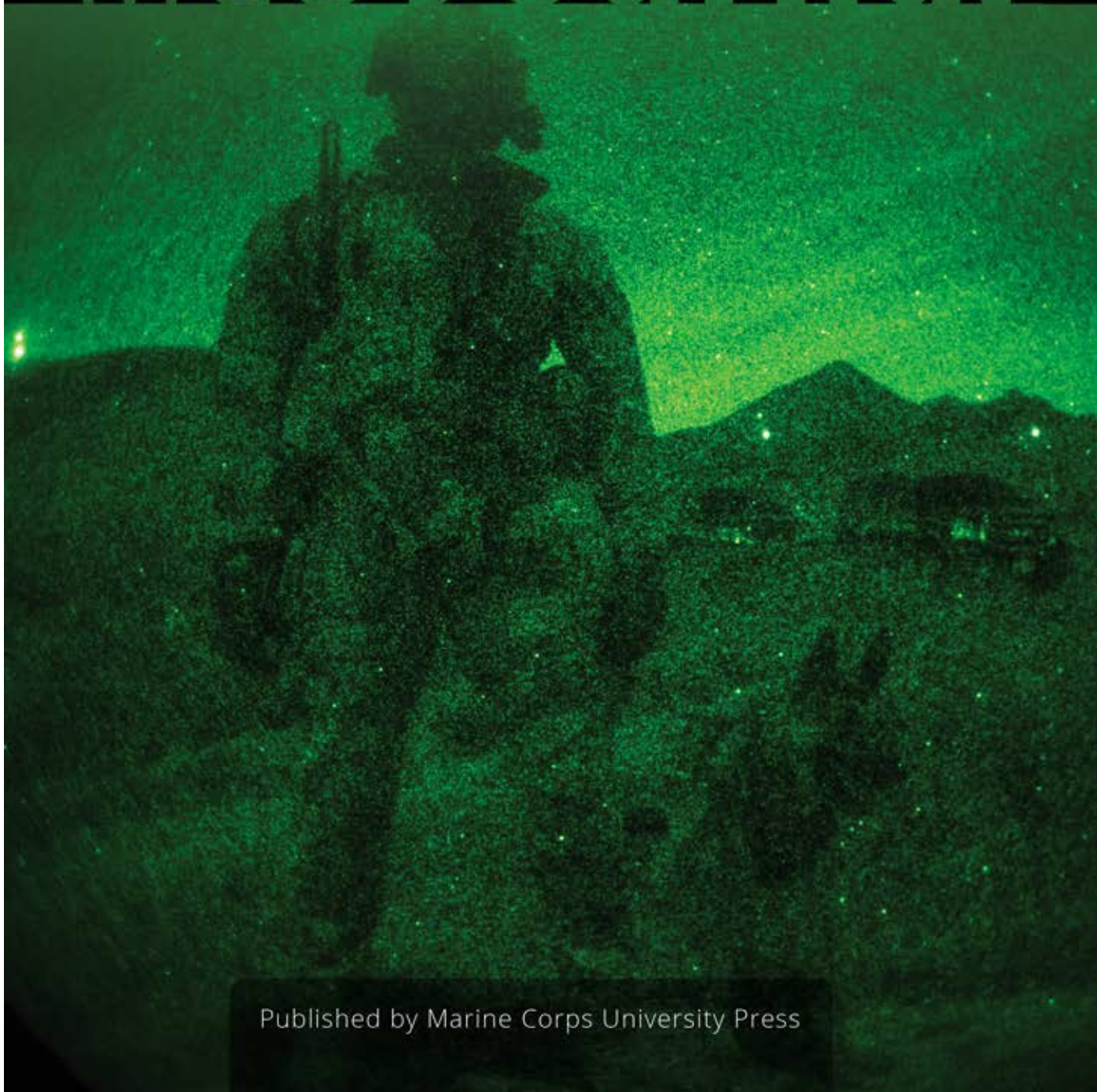
7. Gerhard Scharnhorst, "Anleitung zur Lecture und zu den Feld-Uebungen für Officiere: Anleitung zur Lecture" [Introduction to reading and to field exercises for officers], *Militair-Bibliothek* [Military library], no. 1 (1782): 30–31.
8. For a short discussion of the time that Scharnhorst spent at Wilhelmstein, see "Aus Scharnhorsts Erster Militärische Dienstzeit" [From Scharnhorst's first term of military service], *Militärwochenblatt* [Military weekly] 72, no. 101 (3 December 1887): 2203–9. For a brief biography of Count William of Schaumburg-Lippe and a short description of the military academy at Wilhelmstein, see White, *The Enlightened Soldier*, 3–6.
9. The term *warrant officer* is used to translate the eighteenth-century rank of *conduc-teur*. While not included among commissioned officers, conducteurs performed the sort of duties that would otherwise be assigned to second lieutenants. Count William described the role of the conducteurs as follows: "In case of need, such as when there is a shortage of officers of the watch, conducteurs perform the duties of officers. Con-ducteurs are not non-commissioned officers." Count William of Schaumburg-Lippe, undated note, reprinted in Curd Ochwadt, ed., *Wilhelm Graf zu Schaumburg-Lippe, Schriften und Briefe II: Militärische Schriften* [Count William of Schaumburg-Lippe, writings and letters II: Military writings] (Frankfurt am Main: Vittorio Klostermann, 1977), 98. This volume of the papers and publications of Count William is hereafter referred to as *Militärische Schriften*.
10. Commanded by a major, the artillery corps of Schaumburg-Lippe consisted of seven "divisions," each of which consisted of a lieutenant, a second lieutenant (or conduc-teur), 40 enlisted men, and several students, two of whom ranked as senior non-commissioned officers. Theodor Schmalz, *Denkwürdigkeiten des Grafen Wilhelms zu Schaumburg-Lippe* [Memorabilia of Count William of Schaumburg-Lippe] (Han-nover: Helwing, 1783), 59–60. For descriptions of the field exercises conducted by the artillery corps and practical skills learned by the cadets, see Max Lehman, *Scharnhorst* (Leipzig: S. Hirzel, 1889) 1:25; and Count William of Schaumburg-Lippe, untitled note from 1773, *Militärische Schriften*, 98–99.
11. For a detailed description of the academic program at Wilhelmstein, see Count Wil-liam of Schaumburg-Lippe, *Reglement, die Studia und Exercita der Schaumburg-Lippe-Bückeburgischen Ingenieurs und Artilleristen Betreffend* [Regulations relating to the studies and exercises of the engineers and artillerists of Schaumburg-Lippe-Bückeburg] (Stadthagen: Johann Friedrich Althans, 1770), reprinted in *Militärische Schriften*, 78–87.
12. For a list of subjects addressed in the group classes, see Schmalz, *Denkwürdigkeiten*, 61–62. For the emphasis that Count William placed on extensive and critical read-ing, see Broicher, *Gerhard von Scharnhorst*, 25. For the methods of self-tuition that Scharnhorst employed for learning living languages and mastering mathematics, see Scharnhorst, "Anleitung zur Lecture und zu den Feld-Uebungen für Officiere," 29–33.
13. For an overview of the curriculum followed by Gerhard Scharnhorst at Wilhelmstein, see the records of his *Prüfungsprotokolle* (examinations), reprinted in Michael Sikora and Tilman Stieve, eds., *Gerhard Scharnhorst, Private und Dienstlichen Schriften: Band I* [Gerhard Scharnhorst, private and official writings: Volume 1] (Cologne: Böhlau Verlag, 2002), 3–23.
14. For Count William's instructions to tutors concerning the spirit with which they were to approach both their teaching and their own educational development, see Count William of Schaumburg-Lippe, *Befehle, die Privatinformationen und Vorlesungen in Un-serer Militärschule auf denen Wilhelms Inseln betreffend, vom 9. März 1773* [Commands relating to tutorials and lectures in our military school on William's Island, 9 March 1773] (manuscript), reprinted in *Militärische Schriften*, 91–92. For a list of subjects prescribed and prohibited, see Count William of Schaumburg-Lippe, "Memoranda, das Ostern-Examen von 1774 betreffend" [Memoranda relating to the Eastertime ex-aminations of 1774] (manuscript), reprinted in *Militärischen Schriften*, 101. While this list includes history among the forbidden subjects, an undated note reprinted in *Militärischen Schriften*, 96, indicates that some students studied Portuguese by trans-

- lating accounts of past military campaigns written in that language. For a list of subjects that includes “history and, above all, military history,” see Broicher, *Gerhard von Scharnhorst*, 25. For the works of history upon which Scharnhorst was examined, see *Prüfungsprotokolle*, 20.
15. Scharnhorst was appointed to the rank of *Fändrich*. While this is the direct ancestor of the present-day rank of *Fähnrich*, which is usually translated as “officer candidate” or even “senior cadet,” the conditions of Scharnhorst’s service, as well as the duties he was asked to perform and the time that he spent in that rank, all suggest that his status was that of a commissioned officer. In 1782, in a description of the pay of officers of the British Army, Scharnhorst uses *Fändrich* to translate “ensign,” a rank that, in the British infantry of that time, corresponded to that of second lieutenant in the Royal Artillery and Royal Engineers. Gerhard Scharnhorst, “Vergleichung des Englischen, und Holländischen Besoldungs-Etar” [Comparison of English and Dutch rates of pay], *Militair Bibliothek* [Military library], no. 1 (1782): 141–42. When Count William introduced the rank of *Secondelieutenant* to his artillery corps, he mandated that it be seen as equivalent to the rank of *Fändrich*. Count William of Schaumburg-Lippe, undated note, reprinted in *Militärische Schriften*, 103.
 16. Emmerich Otto August d’Estorff (1722–96) belonged to a family that had previously styled its surname as von Estorff (or von Estorf) and would, in the nineteenth century, revert to that custom. However, in keeping with the Francophile fashion of his times, d’Estorff seems to have preferred to use the French version of his family name. For documents that d’Estorff signed with the French version of his name, see “Statement by Emmerich Otto August d’Estorff,” 15 February 1760, SP 87/37/53, National Archives of the United Kingdom, at Kew; and “Anweisung für Offiziere aus dem Jahre von 1768” [Instructions for officers from the year 1768], *Militärwochenblatt* 82, no. 44 (20 May 1899): 1173–80. For a biography of d’Estorff, see Bernhard von Poten, “Estorff, Emmerich Otto August von,” in *Allgemeine Deutsche Biographie* [General German biography] (Leipzig: Duncker und Humblot, 1904), 48:434–35.
 17. For a précis of the educational philosophy of Emmerich d’Estorff, see the substantial excerpts from his memorandum of 1768, *Anweisung für die Offiziers des Kurbraunschweig-Lünebürgischen Regiments von Estorff* [Instructions for the officers of the d’Estorff regiment of electoral Brunswick-Lüneburg] that were printed as part of “Anweisung für Offiziere aus dem Jahre von 1768.” For d’Estorff’s educational methods, see “Kriegsschule für Reiterei” [War school for cavalry], *Staats-Anzeigen* [State gazette] 8, no. 32 (1785): 465–75. In his biographical article about d’Estorff, *Poten* (Estorff, Emmerich Otto August von, 435) ascribes the authorship of this article to Scharnhorst. Scharnhorst, however, attributes the article to Estorff. This attribution, which is made in the course of a discussion of a dispute over the invention of a new type of telescope, can be found in “Nachricht von der Einrichtung eines Micrometers zum Militärischen Gebrauch” [“Report on the creation of a micrometer for military use], in *Gerhard Scharnhorst, Private und Dienstlichen Schriften: Band 1*, 89–90.
 18. Count William laid out his philosophy of defensive warfare in his *Mémoires pour Servir à l’Art Militaire Défensive* [Notes in service of the art of defensive warfare] (Buckebourg: privately printed, 1775). For various drafts of this work and related notes, see *Militärische Schriften*, 167–363.
 19. In his “Vauban: The Impact of Science on War,” Henry Guerlac provides an excellent introduction to eighteenth-century siege warfare. This article can be found in Peter Paret, ed., *Makers of Modern Strategy: From Machiavelli to the Nuclear Age* (Princeton: Princeton University Press, 1986), 64–90 and the bibliographical notes on 880–81. Readers eager to experience something of the spirit of siegecraft in the century leading up to the building of Wilhelmstein may want to begin with the elegy pronounced by Phillip Pétain on the occasion of the tricentennial of Vauban’s birth. The text of this oration was published in G. T., “Un éloge de Vauban par le Maréchal Pétain en 1933,” *La Revue Administrative* 60, no. 360 (November 2007): 638–41. For a broad overview, well salted with snark, see the diptych by the formidable Christopher Duffy, *Siege Warfare: The Fortress in the Early Modern World, 1494–1660* (London: Routledge and

- Kegan Paul, 1979); and *Siege Warfare: The Fortress in the Age of Vauban and Frederick the Great, 1660–1789* (London: Routledge and Kegan Paul, 1985).
20. For a description of some of these experiments, see Gerhard Scharnhorst, “Von den Militär-Anstalten des Vestorben Regierenden Grafen Wilhelm zu Schaumburg-Lippe,” *August Ludwig Schlözers Briefwechsel* [The correspondence of August Ludwig Schlözer], no. 56 (1782): 93–107. The full text of this article can also be found in Klippel, *Das Leben des Generals von Scharnhorst*, 1:183–88.
 21. D’Estorff, *Anweisung für die Offiziers des Kurbraunschweig-Lünebürgischen Regiments von Estorff*, 1174.
 22. “Kriegsschule für Reiterei,” 469.
 23. The anonymous author of “Kriegsschule für Reiterei” gives the dimensions of the table in *Füße* (feet) and those of the ground represented in *Meilen* (miles). As the precise definition of these measurements in eighteenth-century Hanover varied considerably, their conversion to present-day metric measurements is necessarily approximate.
 24. The description of the maneuver table provided by the author of “Kriegsschule für Reiterei” does not tell us whether the ground depicted on the table was fixed or whether there was some means of changing it. For a description of the use of what would now be termed geomorphic tiles on a wargaming table from the early nineteenth century, see Phillip von Hilgers, “Eine Anleitung zur Anleitung. Das taktische Kriegsspiel, 1812–1824” [An introduction to an introduction. The tactical war game, 1812–1824], *Board Games Studies*, no. 3 (2000): 63. However, the author of “Kriegsschule für Reiterei” does mention that the table was expensive, which suggests that the surface consisted of more than a board with a simple map painted on it. He also mentions a set of movable figures, which might well have included models that represented terrain features as well as those that stood for military units.
 25. D’Estorff, *Anweisung für die Offiziers des Kurbraunschweig-Lünebürgischen Regiments von Estorff*, 1179–80.
 26. D’Estorff, *Anweisung für die Offiziers des Kurbraunschweig-Lünebürgischen Regiments von Estorff*, 1179–80.
 27. The description of the French assembly comes from an undated letter that Scharnhorst sent to his uncle Heinrich Kaspar Scharnhorst at some point between November 1778 and the end of that year. The letter has been reproduced in Karl Linnebach, ed., *Scharnhorsts Briefe* [Scharnhorst’s letters] (Münich: George Muller, 1914), 1:2–3.
 28. For a different interpretation of this passage, which was reprinted in Linnebach, *Scharnhorsts Briefe*, 5, see White, *The Enlightened Soldier*, 7.
 29. Scharnhorst, “Anleitung zur Lecture und zu der Feld-Uebungen der Officiere: Anleitung zur Lecture,” 7–39.
 30. In the foreword to the second issue of the Military Library, see “Vorbericht,” *Militair Bibliothek*, no. 2 (1783): 3–4. Scharnhorst explained that lack of space forced him to move the publication of the second half of his two-part piece on reading and field exercises to the third issue. This, however, did not happen. As the copy of the third issue of the *Military Library* consulted by the author in *Militair Bibliothek*, no. 3 (1784) lacked its front matter, he was unable to determine the reason for this omission. The fourth, and last, issue of the *Military Library* in *Militair Bibliothek*, no. 4 (1784) was published with neither the second half of the two-part piece nor an explanation for its absence.
 31. The use of the terms slow thinking and fast thinking is inspired by Daniel Kahneman, *Thinking Fast and Slow* (New York: Farrar, Straus, and Giroux, 2011).
 32. Peter Paret, *Yorck and the Era of Prussian Reform* (Princeton: Princeton University Press, 1966); Clausewitz and the State (Princeton: Princeton University Press, 1976); and Dennis E. Showalter, “Manifestation of Reform: The Rearmament of the Prussian Infantry, 1806–13,” *Journal of Modern History* 44, no. 3 (September 1972): 364–80.

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