Introduction

Military philosophers through the ages have attempted to analyze, understand and explain the art of war. The doctrines they create are by necessity based on their understanding of the nature of war. This understanding often has parallels within the wider culture. It is no surprise that philosophical concepts about ontology (the nature of being and what exists) and epistemology (the nature how we acquire knowledge and understanding of the world) influence ideas about our understanding of the nature of war.

As we look at the progress of Western military philosophy over time we see a gradually increasing rationalism. It begins with Aristotle and his influence upon the Greek and Roman writers on military strategy. There is a constant undercurrent of rationalism that runs through the Middle ages and Renaissance. In the seventeenth century it becomes a dominant element in the attempt to create a science of warfare. Kant’s criticism of rationalist metaphysics in his Critique of Pure Reason had a strong influence on Clausewitz and his theoretical approach to war. It was left to Moltke to demonstrate how this critical approach could be applied in practice during the wars of German unification.

To follow and understand this trend we first look at the epistemological concerns or dominant cultural metaphors for general knowledge and understanding in each era, followed by a standard philosophical or cultural example. We will then examine how these ideas have influenced the understanding of the nature of war and how that may have influenced ideas for military strategy at that time.

The Classical Era: War as Rhetoric

The earliest surviving complete texts in the Western tradition on the art of war are Asclepiodotus’ Outline of Tactics and Onasander’s The General. Both of these works were written long after the decline of the Greek states as a military power. Neither Asclepiodotus nor Onasander had ever served as a military commander as far as we can tell both were trained as philosophers. They do not seem to be concerned with particulars of how to fight battles and there are almost no examples of actual military practice. It is quite likely that they were written, not as manuals of war, but as exercises in classical rhetoric.1

Aristotle’s Rhetoric outlined the fundamentals of the art of persuasive writing and speaking that were practiced throughout the classical world. Aristotle described the three modes of persuasion used in public speaking: “The first kind depends on the personal character of the speaker; the second on putting the audience into a certain frame of mind; the third on the proof, or apparent proof, provided by the words of the speech itself.”2 These modes are respectively known by their Greek names as ethos, pathos and
logos. Logos, or logic, is demonstrated by the proof or the apparent proof. In dialectical reasoning, used for natural philosophy and scholarly subjects, proof is achieved through induction or syllogism. In rhetoric, used for practical matters, proof is achieved through example and enthymeme, a kind of abbreviated syllogism where the part of the argument is implied rather than stated. Aristotle recommends the enthymeme for oratory as “Speeches that rely on examples are as persuasive as the other kind, but those which rely on enthymemes excite the louder applause.”

In the Poemium that opens The General, Onasander establishes his ethos “for this treatise presents no impromptu invention of an unwarlike and youthful mind, but all the principles are taken from authentic exploits and battles, especially of the Romans.” His dedication of his book on military science to Romans “by reason of their military training (in which they have no brief experience) and because of the distinction of their ancestors” should put his audience into a receptive frame of mind or pathos. The logos of his arguments are built from enthymeme, as in this example from Chapter XXX. “Next the general must consider which troops to oppose to which of the enemy, and in what manner; just as a good doctor who foresees an illness of the body, he must bring forward his defenses and arrange his forces as it seems to him most advantageous.”

The General carefully follows the rules that Aristotle set down for rhetorical persuasion. In addition to following the rules he also follows the content. Onasander tells us that if the war should turn out well the victor, “should not show violent stupidity but kindly good will; for the former excites envy, the later causes emulation. Now envy is a pain of mind that successful men cause their neighbors, but emulation is imitation of the good qualities of others; the desire that another may not have good fortune, but emulation is the desire to equal the possessions of another.” This is almost a direct quotation from Aristotle’s discussion of envy in Chapter 10 of the second book of the Rhetoric. “Envy is pain at the sight of such good fortune as consists of the good things already mentioned; we feel it towards our equals; not with the idea of getting something for ourselves, but because the other people have it.” Chapter 11, directly following, uses a very similar formulation on Emulation. “Emulation is pain caused by seeing the presence, in persons whose nature is like our own, of good things that are highly valued and are possible for ourselves to acquire; but it is felt not because others have these goods, but because we have not got them ourselves. It is therefore good feeling felt by good persons, whereas envy is bad feeling felt by bad persons. Emulation makes us take steps to secure the good things in question, envy makes us take steps to stop our neighbor having them.”

Our earliest Western examples of writing on the art of war appear to understand war not as a science, a craft or an art, but as a subject for the exercise and display of oratory. We have seen the exercise of reason and rhetoric, but mostly applied to the author of our text and not as an attribute of the commander or the actions of his army.

The Medieval Era: War as Religious practice

In the medieval period writing about the art of war still retains elements of rhetorical exercise. The “Art of War” is frequently a literary rather than a military document. We still retain some form of the
standard elements of Aristotelian rhetoric, ethos, pathos and logos. The moral character of classical rhetoric has taken on a more specifically religious quality. The basic epistemology for understanding the nature of war has also shifted. Thomas Aquinas put together the most well known descriptions of scholastic philosophical practice and Scholasticism had strong influence on the writers on the art of war as well.

For Aquinas there are two sources of knowledge about the universe. They are natural revelation, equated with human reason, and supernatural revelation, which is revealed through the holy scriptures, teachings of the church fathers and religious traditions. Supernatural revelation is usually responsible for our knowledge of religious doctrines like the trinity and some moral principles. However Aquinas believed that Natural revelation was capable of discovering most of the basic tenets of religious and ethical doctrine such as the existence of God or basic moral behavior.

Aquinas describes three operations of the intellect which are the basis for natural revelation: the understanding of particular things, the understanding of combinations and differences and reasoning, which takes knowledge of things that are known to discover things that are previously unknown. His source for the three operations are Aristotle’s *Categories* (for particulars), *On Interpretation* (for combinations and differences) and *Prior Analytics* (for reason) “in which there is a treatment of … the various kinds of syllogism and arguments by which reason moves from one thing to another.”

Aquinas’ epistemology has a few notable features that were typical of the period that we will show up in writers on the art of war. First of all is a central preoccupation with the moral and ethical dimension of all behavior. In addition there is a strong reliance on religious sources which are often supplemented by secular, especially classical sources. Also the use of enthymemes was a favorite rhetorical strategy.

An excellent example of the medieval approach to writing an art of war is Christine de Piza’s *Livre des fais d'armes et de chevalerie*, written in 1410. She relies heavily upon Roman sources: Vegetius, Frontinus and Valerius Maximus, and often ignores the vast differences between Roman and Medieval military practice. Her main emphasis is not upon how to be successful from what we would regard as a military perspective but how to be ethical and moral when engaged in fighting wars and battles. Van Creveld criticizes her and her contemporaries for not creating true military theory or a coherent philosophy of war. Her concentration on the moral justification for war and behavior during battle may seem peculiar to our modern sensibilities. However, she clearly demonstrates that her sense of military success is based not just in the temporal battlefield, but more importantly in the life hereafter.

Her epistemology of war is demonstrated in this example from her discussion of the justified causes for Wars and Battles: “I do not find in divine law or in any other text that, for these causes, without any other ground, it is proper to start any kind of war or battle upon any Christian land, but rather the contrary. For according to God's law it is not proper for man either to seize or usurp anything belonging to another, nor even to covet it. Likewise, vengeance is reserved for God, and in no way does any man have the right to carry it out.”

The moral dimension is dominant in this example. The focus is clearly not how to overcome an adversary but how to act in a moral and ethical manner when at war. She uses three ways of justifying her
thesis. First and most important is the authority of scripture and religious traditions, which she refers to as “divine law” and later as “God’s law.” This is supported by secondary authorities found in “any other text.” This refers to her secular writers on military craft; her Roman sources mentioned above as well as her other main source for more recent practice, Honore Bouvet’s *Arbre des batailles* (1386-89). She also makes use of Aristotelian rhetoric, concluding with an enthymeme or abbreviated syllogism:

1) Vengeance is reserved for God (stated primary premise)
2) Man is not God (implied secondary premise)
3) Man cannot carry out vengeance (conclusion)

Christine of Piza’s main focus in her discussion of the art of war is with the moral and ethical dimension of military actions. Religious documents and traditions are her primary sources for evaluating war. These are often supplemented by classical sources for details on secular aspects of her particular subject. She continues to use variants of Aristotelian rhetoric including the enthymeme or abbreviated syllogism.

**The Renaissance: War as Essay**

Jacob Burckhardt in *The Civilization of the Renaissance*, outlines the dominant epistemology of the Renaissance era. “The literary bequests of antiquity, Greek as well as Latin… were held in the most absolute sense to be the springs of all knowledge.”

These texts of classical antiquity were not used as we saw in the middle ages with Christine de Piza, as rules to be learned, understood and followed. Rather they became part of a conversation. Renaissance writers “acted as mediators between their own age and a venerated antiquity, and made the latter a chief element in the culture of the former.”

Montaigne is an excellent example of this approach to understanding the world. Having retired from active life, Montaigne retreated to his library to read and think about the great classical writers. While he holds them in great respect, he compares them with each other and with what he has seen and experienced himself. He documents these experiments in his book *Essais* first published in 1580.

The French word *essai*, from which we derive our English word “essay,” meant at the time a trial, test, experiment or assay and was derived from the Latin verb *exigere* meaning to weigh, consider or examine.

This is a perfect description of Montaigne’s method. A typical *Essai* will begin with a subject for consideration. Montaigne may present some initial ideas and thoughts he has, and then he will compare those ideas with one or two classical authors and perhaps consider some other alternatives. He examines, tests and experiments with ideas from multiple points of view: pro and con, ancient and modern, the familiar and the alien. He even wonders if he has “merely gathered here a big bunch of other men’s flowers, having furnished nothing of my own but the string to hold them together.” While his essays rarely end with a conclusion it is clear that the consideration of a variety of perspectives was of greater importance to him than arriving at an answer.

Not all attempts to apply this epistemological approach to the art of war were successful. Gian Antonio Porcellio dei Pandoni’s report on the Milano-Venetian war of 1451-52 brought together the ancient and modern but “it is written, not in the purest, but in a fluent Latin, a little too much in style
of the humanistic bombast of the day, is modeled on Caesar’s Commentaries, and interspersed with speeches, prodigies and the like.”

More successful was Machiavelli’s *Dell’arte della guerra* of 1520. While Van Creveld gives Machiavelli low marks as a theorist claiming that he is wrong on his three key propositions—dismissing artillery, supplementing pike with swords and preferring the citizen-soldier militia to professional mercenaries, we have come a long way from Christine de Piza. No longer a rulebook or treatise on personal morals, Machiavelli’s approach to the art of war explores how the military can be used to support a state.

He gives advice on how to win on the battlefield, but almost as important are the implications of the battlefield on politics. Van Creveld criticizes Machiavelli’s insistence on citizen militia over the obviously more effective professional soldier. The professional soldier is more effective on the battlefield, but Machiavelli argues that the citizen militia is much better for the state. The citizen militia is dedicated to protecting its home and will remain loyal to the republic or principality. Mercenaries will act in their own best interests. The can be bought, change sides refuse to fight and while they are excellent fighters, they pose political risks.

Another change that is apparent in *Dell'arte della guerra* is the way Machiavelli uses the classic texts. Like Christine, Machiavelli has borrowed heavily from the Roman classics, including Vegetius and Frontinus. In the *Dell'arte della guerra* this material takes on a very different form. Where Christine uses the ancient to regulate behavior, Machiavelli uses them as grounds for discussion. Machiavelli will eventually side with the theorists of the Roman republic, placing them in the mouth of Fabrizio Colonna, his central figure. The ideas from the classics are not for veneration only but are open to discussion, debate and modification—to be evaluated in the light of contemporary circumstances.

This approach is used with better results in his political works, *Il Principe* (1513) and *Discorsi sopra la prima deca di Tito Livio* (1512-17). Here his interaction with the classics leads to a greater synthesis. His doctrines of realism and expediency in the *Il Principe* helped to move western culture away from reverent acceptance of the authority of the ancients to a greater reliance upon empirical data and our own reason.

**The Age of Reason: War as Geometry**

The seventeenth century saw the rise for philosophical rationalism. Philosophers inspired by new experimental approaches to science sought to put metaphysic and epistemology on the same firm basis as the mathematically based sciences of physic, optics and astronomy. Rene Descartes began with an attempt to start from first principles, as in geometry, and to derive further concepts through carefully prescribed rules and principle for thinking and deductions that he outlined in his writings *Rules for the Direction of the Mind, Discourse on the Method of Rightly Conducting Reason* and *The Principles of Philosophy.*

Descartes was followed by Baruch Spinoza and Gottfried Leibniz tried to extend this approach to apply mathematical principles to problems in metaphysics, epistemology and ethics. They believed that it
was possible to derive all possible knowledge using deductive reasoning from basic axioms. Spinoza, in his *Ethics* (1677), went so far as to write his entire system in the form of a geometric proof with definitions, axioms, lemmas, propositions, scholium, corollaries and proofs. Christian Wolff, writing in German, popularized the deductive mathematical approach and applied to a very wide variety of subjects.

The application of the rationalist approach to the methods and conduct of war began slowly. Raimund Montecuccoli, in his *Memoire della guerre* (1643), created a systematic approach that was based on observation and reason. Sébastien de Vauban, in his *De l’attaque et de la défense des places* (1706), extended the use of mathematics in the science of war. He created a methodological system that used geometry and geometric illustrations to demonstrate the construction of defensive fortifications and how to attack and conduct siege operation against them. These initial uses of mathematical science were sensible and appropriate, especially for the largely engineering-oriented construction of fortification and siegeworks.

The following generations took these ideas to an extreme. Theorists like Jacques François de Puységur and Adam von Bülow created elaborate systems and rules based on logic and reason. Henry Lloyd, in his *Continuation of the History of the Late War in Germany*, provided elaborate discussions of the width, depth and arrangement of columns, lines, squares, parallelograms and circles believing “that the first formation of the troops should be so general as to be applicable to every particular case, and require no change during the action.”

Jacques de Guibert’s *Essai général de tactique* (1770) sought to take advantage of “the effect of mathematical enlightenment spread through the science of war.” He created a system grand system that utilized citizen-soldiers organized into divisions and emphasized mobility and concentration. Many of his ideas became reality during the Napoleonic wars. However, Guibert believed that armies were becoming too large and looked forward proclaiming that “as the science of modern war improves and gets closer to true principles it might, then, become simpler and less difficult.” He envisioned smaller armies that were relieved from many of the constraints of supply and geography and hence more mobile, using simpler tactics and winning battle through brilliant maneuvers.

Antoine de Jomini’s *Précis de l’Art de la Guerre* first published in 1838 is perhaps the greatest of the rationalist approaches to military theory. He takes the objectives, bases and lines of operation from previous systems and expands their context, situating them in theaters and zones of operation. While his book is populated with illustrations of the geometry of the various combinations, in many ways his theory is less inclined to sterile geometry and more aware of complicating factors of war. His operations react to and work around roads and rivers, fortresses and fortifications, mountains and forests. He is aware of the effect of politics on war and even disturbed by guerilla tactics of national wars.

While his theory was considerably less abstract than the earlier Rationalists theories he did ultimately believe that “the theory of the great combinations of war is in itself very simple, and requires nothing more than ordinary intelligence and careful consideration.” His primary focus was to bring superior force to bear on a portion of the enemies troops through operating on internal lines, movements to the rear, or when possible, encirclement. He insists that
“The application of these fundamental principles is also very simple. If you have one hundred battalions against an equal number of the enemy’s, you may, by their mobility and by taking the initiative, bring eighty of them to the decisive point while employing the remaining twenty to observe and deceive half of the opposing army. You will thus have eighty battalions against fifty at the point where the important contest is to take place. You will reach this point by rapid marches, by interior lines, or by a general movement toward one extremity of the hostile line.”

The math is impeccable, but for all complicating factors that Jomini accounts for in his rational system he seems to have forgotten that enemy with his one hundred battalions might also have read his book.

The Enlightenment Critique of Rationalism

The rise of the rational and experimental approach produced great advances in mathematics and the physical and biological sciences in the seventeenth and eighteenth centuries. The philosophical disciplines, on the other hand, seemed to continue same arguments they had been using for centuries, without any sense of the rapid progress and mathematical certainty that informed the hard sciences. Immanuel Kant began his famous *Kritik der reinen Vernunft* (1787) with the question “Why has metaphysics not kept pace with mathematics and the natural sciences? Is it possible for metaphysics to be a science?”

In order to answer this question Kant looks the characteristics of our understanding. He describes two kinds of knowledge. *A priori* knowledge is made up of “general truths, which at the same time bear the character of inward necessity, must be independent of experience, —clear and certain by themselves.” This is pure knowledge, as it is independent of experience. Examples would be laws of mathematics like “2+2=4” which needs no experiential verification. *A posteriori* knowledge is “what is simply taken from experience.” It is empirical knowledge and is dependent upon our perceptions and experience. One example might be the observation that “the sky is blue.”

Kant also describes two kinds of judgements. Analytic judgements involve identity and are illustrating judgements since they illustrate what a particular object is. An example would be “a bachelor is an unmarried man” as a “bachelor” is identical with an “unmarried man” and thus illustrates the concept. Synthetic judgements are expanding judgements as they expand our understanding. An very simple example would be “wood floats on water.” “Floating on water” is a property of the substance “wood,” but not one that is identical with the idea of wood, so it expands our understanding.

The great advances in the sciences were based on creating synthetic judgements, ones that expand our understanding, through the use of *a posteriori* knowledge through empirical observation. Metaphysics is not about the empirical world, but about the transcendental world. In order to have a science of metaphysics we need to find a way to make synthetic judgements through the use of *a priori* knowledge. We need to build knowledge on the basis of pure reason alone as was attempted by Spinoza and the other rationalist philosophers.

Kant’s concluded that it was possible to have synthetic *a priori* judgements in mathematics and some natural sciences but almost never in metaphysics. It is not possible to create philosophical systems of metaphysics like those of Spinoza and Liebnitz on the basis of reason. Pure reason was not sufficient to
provide us evidence of any transcendental knowledge. Kant believed that his philosophy “should be called a critique, not a doctrine, of pure reason. Its usefulness would be negative only, serving for a purging rather than an expansion of our reason, and, what after all is a considerable gain, guarding reason against errors.” Kant’s Critique of Pure Reason was widely read and influential. Even though Kant allowed for synthetic a priori knowledge in areas of mathematics and the natural sciences, the attempt for wide systematic application of pure reason to all problems gradually lost its hold on the culture.

The Clausewitz’ Critique of Rationalism

“Clausewitz did not need to read the works of his contemporary Kant (and there is no evidence that he did) to become familiar with these ideas which formed the basis of Kant’s philosophy… The young Clausewitz would have encountered such ideas as these wherever he turned: in his reading at Neuruppin in the 1790’s, at the War College where Kant’s pupil Kiesewetter was expounding Kantian philosophy, and in the intellectual circles in which he moved in Berlin.

Bernard Brodie points out the influence of Kant in his article “A Guide to the Reading of On War.” He equates Clausewitz “pure conception of war” with Kant’s idea of “Ding an sich,” the “thing in itself” or noumena. But he quickly dismisses the connection remarking that "fortunately, Clausewitz was of much too pragmatic a fiber to lose himself either deeply or for long in this brand of idealism." What Brodie seems to miss is that Kant’s Critique was exactly the theoretical basis that Clausewitz needed to support his pragmatic project of redefining the nature of war.

The noumena are the most basic substance that makes up the world. Yet according to Kant we “cannot know these noumena by means of the categories [mechanisms of human perception and understanding], but can only think of them under the name of something unknown” This parallels Clausewitz description of his own subject matter.

“War is the realm of uncertainty; three quarters of the factors on which action in war is based are wrapped in a fog of greater or lesser uncertainty … War is the realm of chance. No other human activity gives it greater scope: no other has such incessant and varied dealings with this intruder. Chance makes everything more uncertain and interferes with the whole course of events”

Yet when Clauswitz looked at the dominate theorists on the art of war they all continued to pursue an attempt to reduce the complex and unknowable into systems of simple rules and principles, in the same manner as the Rationalist philosophers.

“Bülow considered envelopment the key to victory in battle, and from this principle developed a geometrical system, to which—as all charlatans are want to do—he ultimately gave a veneer of mathematical elegance. A host of others, headed by Mathieu Dumas, discovered that the fundamental principle lay in the possession of the higher ground. By way of numerous half-truths and doubtful conclusions this led to a highly picturesque system of geological analogies… General Jomini, finally, emphasizes the concentration of power at a single point and deduces from this a geometric system of internal lines directly opposed to that of Bülow.”
Clausewitz critique of the Rationalist approach to the art of war is the same as Kant’s critique of Rationalist metaphysics. He even uses the same vocabulary and distinctions found in Kant’s Critique.

“It is only analytically that these attempts at theory can be called advances in the realm of truth; synthetically, in the rules and regulations they offer, they are absolutely useless. They aim at fixed values; but in war everything is uncertain, and calculations have to be made with variable quantities.”

He understands the limits of a priori systems and their application to the complex art of war. Simple analytic formulations do not do justice to the complexity and number of variables.

“No logical sequence could progress through their innumerable twists and turns as though it were a simple thread that linked two deductions. Logic comes to a stop in this labyrinth; and those men who habitually act, both in great and minor affairs, on particular dominating impressions or feelings rather than according to strict logic, are hardly aware of the confused, inconsistent, and ambiguous situation in which they find themselves.”

In addition, warfare is not a closed system like geometry. Even if we could define and understand all the factors that account for results on the battlefield there are still additional outside influences on the motivation, drive and purpose of the military action. While most interpret Clausewitz statement “War should never be thought of as something autonomous but always as an instrument of policy” as a statement about politics, it is also a statement about the very nature of war and a key part of Clausewitz critique of rationalism. Policy provides the basic axioms that define a campaign. Even these are subject to constant and unpredictable change. This hardly provides the basis for a simple and stable system of deductions.

Clausewitz conclusion about the Rationalist dream of creating a “science” of war exactly parallels Kant’s results in his investigation into the “science” of metaphysics. “The term “science” should be kept for disciplines such as mathematics or astronomy, whose object is pure knowledge.” For Clausewitz it is misleading to try to create a science of war. Clausewitz does not seem to fit war into the realm of art or craft either.

“We therefore conclude that war does not belong in the realm of arts and sciences; rather it is part of man’s social existence. War is a clash between major interests, which is resolved by bloodshed… Rather than comparing it to art we could more accurately compare it to commerce, which is also a conflict of human interests and activities; and it is still closer to politics, which in turn may be considered as a kind of commerce on a larger scale.”

If there can be no science of war, no system of principles or laws that define the nature of war how does one come to an understanding of war? What can be done in the absence of a comprehensive theory? Clausewitz, like Kant, has offered a critique, not a system. His “theory need not be a positive doctrine, a sort of manual for action.” Instead it should set the limits of knowledge and understanding and define the boundaries of the realm in which one needs to operate. “Theory exists so that one need not start afresh each time sorting out the material and plowing through it, but will find it ready to hand and in good order. It is
meant to educate the mind of the future commander, or, more accurately, to guide him in his self-education, not to accompany him on the battlefield.”

Even without attempting a comprehensive system Clauswitz’ guide for self-education ran to more than five hundred pages. His extensive analysis of the nature of warfare led him to some recommendations that serve as the basis for educating future commanders. Three of the most important are as follows:

“The first rule, therefore, should be: put the largest possible army into the field.”

“Consequently, the forces available must be employed with such skill that even in the lack of absolute superiority, relative superiority is attained at the decisive point.”

“Strategy decides the time when, the place where, and the forces with which the engagement is to be fought, and through this threefold activity exerts some considerable influence on the outcome. Once the tactical encounter has taken place and the result—be it victory or defeat—is assured, strategy will use it to serve the object of the war.”

These are not rules and principles but guidelines. They give direction but do not spell out the details. They provide a basic philosophical approach, but allow room to adapt for individual situations. It is the responsibility of the commander to translate this approach into actionable plans.

Clauswitz died in 1832, before he completed his manuscript for On War. It fell to his successors to find a way to realize his critique and utilize it in the actual practice of war.

The Critique in Practice

How does one deal with war that does not follow rational and logical rules? How do you create a system for dealing with a non-rational war of friction and accident? Clausewitz’ critique stated that rationalist systems of war were not applicable to the complex dynamics of armed struggle. Clauswitz died before he could realize the practical implications of this critique. It was left to the next generation of military leaders, particularly Helmut von Moltke to work out and perfect those details. Moltke took the ideological understanding of war created by Clausewitz and created the command system for the Prussian armed forces in the second half of the nineteenth century.

Moltke, along with Bismark, was one of the architects of the unification of Germany and creators of German empire. Many have claimed that technology was what made this possible. They especially point to the use of railroads and the telegraph as key to the Prussian victories in 1866 and 1870. But Moltke’s real accomplishments were not technological. His real innovations were more in the realm of the practical and organizational.

The use of railroads for transportation and logistics of a large army requires the coordination of rail lines and time schedules with a mathematical and scientific precision. Movement by rail is restricted in possible routes, requires careful and precise planning yet relies upon technology that may malfunction. Alternatively, the movement of troops by columns is less confined to pre-established rail corridors and the rate of movement is dependent upon terrain and morale. Movement by column is more intuitive, flexible
and relies more upon human factors.\textsuperscript{48} It would seem that movement by column would be more in line with the Clausewitz critique of rational war as it relies less upon calculation and is dependent on human factors and abilities like insight, intuition, determination and morale.

Van Creveld suggests, in his book \textit{Supplying War: Logistics from Wallenstein to Patton}, that railroads did not provide an advantage for Moltke. The Prussian rail system was inferior to that of the French\textsuperscript{59} In practice, the Prussian supply system was a failure. This failure was mitigated by three factors. First, that France was one of the richest agricultural nations in Europe. Second, the rapid Prussian advance allowed even a large army to forage off the land.\textsuperscript{50} Third, ammunition was resupplied not because of the efficiency of the rail networks but because of the relatively small expenditure during the campaign.\textsuperscript{51} While the use of railroads at the time was a novelty in European war, Van Creveld concludes that their use has been greatly over-rated in the analysis of the Prussian campaigns and were not a decisive factor.\textsuperscript{52}

Moltke’s basic operating principle was that the value of strategy “lies entirely in concrete application.”\textsuperscript{53} As a result he agrees with the Clausewitz critique that “General theories, and the resulting rules and systems, therefore cannot possibly have practical value in strategy.”\textsuperscript{54} Instead, “strategy is a system of expedients; it is more than a mere scholarly discipline. It is the translation of knowledge to practical life.”\textsuperscript{55} This translation to practice was accomplished through a series of reforms related to planning, preparation and command.

The first of the reforms were to ensure that Prussia was in a state of readiness for armed conflict. “Strategy furnishes tactics with the means for battle and assures probability of victory by directing the movements of the armies and bringing them together on the battlefield…Strategy must keep the means that tactics require in readiness at the proper time and place.”\textsuperscript{56} Clausewitz’s first and most important rule was to achieve numerical superiority. For strategy to bring superior numbers to the battlefield they needed a large army to draw on. To achieve this the Prussian state instituted universal conscription.

Clausewitz saw war as uncertain and ruled by chance and accident. Moltke recognized that “because of the diversity and the rapid changes in the situations in war, it is impossible to lay down binding rules. Only principles and general points of view can furnish a guide.”\textsuperscript{57} In order to operate most effectively in an environment that is rapidly changing and full of unknown variables, Moltke instituted a highly decentralized system of strategic command. The highest orders of command will not often have them most recent or most accurate information about the state of affairs on the battlefield. “In general, one does well to order no more than is absolutely necessary and to avoid planning beyond the situations one can foresee. These change rapidly in war. Seldom will orders that anticipate far in advance and in detail succeed completely to execution.”\textsuperscript{58}

Strategic planning will attempt to set up an advantageous initial situation. But once an army encounters the enemy “prearranged designs collapse, and only a proper estimate of the situation can show the commander the correct way. The advantage of the situation will never be fully utilized if subordinate commanders wait for orders. Only if leaders of all ranks are competent for and accustomed to independent action will the probability exist of moving large masses with ease.”\textsuperscript{59}
“The strategic object governs the premeditated decision to engage in battle. A resulting accidental encounter, which happen often, is purely an act of tactics. Strategy governs the movements of the army for the planned battle; the manner of execution is the province of tactics.” Tactics were usually left to the judgement and training of the subordinate officers in the field who were close to, and better able to accurately assess the tactical situation. To insure that this happened in practice Moltke gave detailed instructions on the method and style of communications between command authorities and field units. These were eventually published in his 1869 *Instructions for Large Unit Commanders*, which provided the basis for large-unit operations in Germany through the Second World War. While the instructions were very specific the basic principle behind them was that “the higher the headquarters, the shorter and more general will be the orders. The larger the main subordinate units, the more freedom must be left to them.”

With Moltke we have arrived in the modern era of the art of war. Our earliest western practitioners of the art were long on theory, but short on examples. Many of the examples we did see were from centuries earlier and related to antiquated practices. Moltke wastes little time on theory. His theoretical observations are short and aphoristic. They often occur in the midst of detailed summaries or outlines of campaigns. The example dominates the theoretical and this reflects the very practical nature of Moltke’s understanding of war.

**Conclusion**

Western military philosophy began as an exercise in oratory and rhetorical persuasion. These writers were influenced by Aristotle and formed the beginning of an ever increasing rationalist tendency in the western approach to the art of war. This constant undercurrent of rationalism runs through the Middle ages, with its emphasis on Christian moral behavior in war, and into the Renaissance where we see a greater dialogue with, and questioning of the classical tradition. In the seventeenth century rationalism becomes a dominant element in the attempt to create a science of warfare. This rational science of warfare was brought into question by Kant’s *Critique of Pure Reason* and its influence on Carl von Clausewitz and his theoretical approach to war. Helmut von Moltke was able to take this anti-rationalist theoretical framework and turn it into the concrete and pragmatic methodology more familiar to us today.

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