FOREIGN WAR GAMES.

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The war game (called in Germany Kriegsspiel), or rather competitive maneuvering on the map, in favor in most foreign armies, is designed to perfect the instruction of officers by utilizing the winter period, during which maneuvers and drills on varied ground are rarely possible on account of the small number of well-drilled men and the rigors of the season.

This instruction is composed of two entirely distinct parts.

The first is theoretical, and involves a knowledge of rules and mechanical execution of movements, or evolutions, on the drill ground; while the second is practical or, more accurately speaking, tactical, and consists in applying, in a concrete case, the best means and principles to insure the success of a well-defined purpose.

Theoretical instruction is easily acquired. In the first place, officers are supposed to know the tactical object of evolutions and formations, and once this result is accomplished, the study of their mechanism on the drill ground presents no greater difficulty than the execution of the strict rules laid down in drill regulations.

It is not so with the second, which can be acquired only through individual effort, aided and directed by superiors. For an officer to possess knowledge is not sufficient; he must know how to utilize it. The questions are: Under what circumstances will he be called upon to utilize it? In war, in battle, where any loss of time, any hesitation, any mistake results in disaster. Will instruction which is purely theoretical suffice at such a moment? Certainly not, for it only applies to general cases; its rules and principles are only indications, totally insufficient for special and exceptional cases. Now, everything is exceptional in war, and whoever relies upon his memory, or assumes to govern his action by a formula or set rule, and considers it equally applicable to all ground and in all situations, must not hope to succeed.

It is necessary, in any situation whatever, that an officer be able at one and the same time to make a rapid decision appropriate to the circumstances and to express it no less rapidly in clear and concise orders. But few men are so well endowed as to possess these qualities intuitively; the greater number can acquire them only by patient industry. So long as the officer could learn his trade on the battlefield itself, he had no need of the instruction here in question; but just in proportion as wars are becoming more rare, and the officer has had less and less occasion to exercise the functions of his profession—the very essence of the reason for his existence—the proper means of developing his tactical knowledge has been increased in time of peace.

Drills on varied ground, garrison maneuvers, grand maneuvers, practical instruction without troops, and staff journeys succeed each other time and again, giving to the officer an opportunity for practice in particular cases and on different fields. He can thus prepare himself for the rôle he will have to play in time of war—a rôle the difficulties of which will then be augmented by the new factors—danger and the unknown. But maneuvers in time of peace, which constitute the true school for officers, do not entirely meet the requirements. Field exercises in the vicinity of garrisons are always very limited on account of agricultural interests; and grand maneuvers, occasioning very heavy expense, are necessarily of short duration; one prominent factor, important for instruction, the unknown, is practically eliminated from both, for a participant is always quite familiar with the composition and strength of the opposing forces; moreover, they can be conducted only during a certain portion of the year.

Much inventive talent has been exercised in trying to supply these deficiencies. Means have been sought to represent the operations of war in a tangible manner without the cooperation of troops, and the most important result of these efforts was the discovery and perfection of a judicious and practical method of competitive maneuvering on the map. But the period of evolution which culminated in that result was long, and nothing in the first attempts foreshadowed the definite form which it has assumed.

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The object of this paper is to present a view of the different phases through which the "war game" has passed and to review the works devoted to it in foreign military literature.

It is divided into three distinct periods:

The first, that of the "game of war chess," reaches from the time of its invention to 1824. At that epoch commences the second period, that of the war game proper. Its promoters were Lieutenant von Reisswitz and his father, counsellor of the war department, who, abandoning the chessboard, made use of maps, and prepared for its execution a set of rules, which, with certain modifications, were used until 1875.

Finally, the third period, which one may call that of *Competitive map maneuvers*, is characterized by the works of Captain Meckel and of Colonel von Verdy du Vernois.

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FIRST PERIOD—THE GAME OF WAR CHESS.

The principal promoters of the "game of war chess" in Germany are Helwig et Venturini. Helwig, a master of pages at the Court of Brunswick, first, in 1780, made public the rules of the game, and should be considered as its real inventor. Venturini, a tactician, author of "A mathematical system of applied tactics and of the science of war proper,"* published later, in 1797, the "Rules of a new war game for the use of military schools."†

At the end of the last century, military studies in Prussia had assumed a purely scientific character; a new science was born—*Mathematical military science.* Received with favor, sanctioned by the royal order of June 7, 1790, regulating the course of study at the "War Academy," these theories made sensible progress. "The tactical and strategical writings of that epoch had, for the greater part, an outlandish resemblance to a course in geometry; a true strategist of that epoch did not know how to lead a corporal's guard across a ditch without a table of logarithms."‡

* "Système mathématique de tactique appliquée et de science proprement dite de la guerre."

† "Règles d'un nouveau Jeu de la guerre à l'usage des écoles militaires."

‡ V. der Goltz. Rosbach et Iéna, translation by Commandant Charbert, pages 287, *et seq.*

The game of war chess also felt that influence.

An examination of the inceptive state of the war game evidently presents but a purely retrospective interest; however, we believe it necessary to give a few details solely on account of their originality.

In a letter dated September 26, 1801, Helwig wrote: "You know that it was in the year 1780 that I published my first essay on the tactical game. That idea came to me first through a need which I experienced of rendering sensible, not to say palpable, a few principles and rules of the military art which my position as professor to the pages of the Duke of Brunswick required me to teach those young noblemen, destined some day for military service. Independently of this chief object my secondary one was to offer those who had no need of such resources an agreeable recreation by laying before them a game which, at first sight, presented different objects and operations, and which depended upon nothing but the rules and combinations made by the players.

"The first thought which presented itself to my mind was that the learning of my game ought not to be burdened with too many details if it was to fulfill its mission. I judged from the first that I should achieve my object in the quickest way if I took for its basis the game of chess, in favor with so many distinguished persons of all ranks. My idea was to adapt, as far as possible, the game of chess to my own game, in order so to interest amateurs that they would at least give mine a trial.

"I was not deceived in my expectations, and experience confirmed the wisdom of my judgment, for chess players were the first to welcome my invention; they found it a great source of amusement, and set to work to make it better known. Numbers of military men, profound in the theoretical and practical science of their art, examined it to see if it were possible that the principles of tactics could receive sensible development through channels of pure recreation. They were not disappointed in the ideas they had conceived of it; they recognized in it a very efficacious means for awakening the attention of young men destined for military service, by creating in them a taste for it, and for lessening the difficulties of instruction."

Such are the motives which induced Helwig to adopt the form of the game of chess for his invention. We shall now glance at the rules he adopted for playing his tactical game.

The chessboard consisted of 1,666 small squares, about 3 centimeters on a side, placed side by side and tinted in various colors. These were either pasted on a card and represented a single feature of the terrain, or were represented by colored cubes, joined together, and placed in a frame. As the cubes bore on each of their faces one of the six colors adopted, the configuration of the terrain represented could be almost infinitely varied. The colors were as follows:

Black and white squares represented level ground.

Red squares indicated mountains inaccessible to troops and rendering firing impossible.

Green squares represented marshes which, though not practicable for troops, permitted firing over their surface, and another shade of green represented forests.

Blue squares served to indicate lakes or ponds, a line of blue squares serving for a water course which could be crossed only by aid of pontoons.

Squares half blue and half red denoted buildings, villages, or cities.

A dotted line through the middle divided the chessboard into two camps and marked the frontier.

Finally, in order to represent easily the different changes and accidents of ground, each square bore a number, and the theater of operations was divided into provinces, which were designated by letters.

Each side had in the corner of its chessboard a fortification, in which parapets, ditches, and other defenses were indicated by conventional signs, and which figured as the adversary's objective: it took the place of the king in chess, for the taking of the last square of the chessboard, which represented the citadel, signified the winning or losing of the match.

Troops were represented by pawns similar to those used in chess: all the pieces were considered, not as individuals, but as battalions of infantry or squadrons of cavalry.

The players received in each camp the same number of pawns, which could be grouped as desired before the commencement of the match. Several players could be chosen for a match, one of them having the direction of the game.

To each player were assigned:

60 battalions of fusileers or grenadiers, which also acted as artillery;

25 battalions of pontoniers, which also performed service as grenadiers and as artillery;
8 squadrons of dragoons;
12 squadrons of hussars or light cavalry;
10 batteries of fieldpieces;
3 batteries of siege guns;
2 mortar or shell gun batteries;
100 pontoon boats, and
200 pieces of cardboard to indicate intrenchments.

Besides the eight squadrons of dragoons each party had four squadrons of dragoons dismounted, each represented by an infantry piece surmounted by a hat. These four pieces remained out of play until the moment the player wished to use them, when they were exchanged for four pieces of dragoons which had been dismounted. The hat was also used to indicate pontoniers.

Each pontonier pawn could put four pontoon boats in place; to designate the number of boats any pontonier had at his disposal, there were supplied four flat caps marked with 1, 2, 3, or 4 points. As a pontonier placed a boat, the player took away from him a cap and substituted another for indicating the number of boats remaining at his disposition. The same operation was applied inversely, when a pontonier took up a boat which had been in use.

The troops marched and fought according to fixed rules very similar to those of chess.

The infantry and cavalry, like the queen in chess, could march in any and in all directions in a straight line. The infantry could, in one move, advance eight squares; heavy cavalry, twelve; light cavalry, sixteen. The latter could also move like the knight in chess. The artillery had all the movements of the castles.

Very minute rules governed the conditions of the contest, whether with side arms or firearms; and numerous precepts set forth the methods of employing artillery, pontoniers, trenches, etc.

Such was, as a whole, the first effort at creating a war game. It was a great success; and a number of military writers, not only in Germany, but in Italy and Austria, hastened to follow the example and proposed tactical or war games based on the same principles.

In France, M. Cramer, a printer and publisher and an ex-professor in the University of Kiel, took it upon himself to

introduce Helwig's invention. He commenced by using the press to obtain desired publicity, and the *Journal des Débats* of "10 Nivôse an XI"* printed a very eulogistic article concerning it. M. Cramer brought out a tract giving a general idea of the rules of Helwig's game, and followed it with an appeal for voluntary subscriptions to cover the expense of a new and complete edition.

"Until a subscription sufficient to meet the cost of printing shall have been raised, he invites all possible friends of the game in Paris to become acquainted with it by following a *theoretical and practical course* to be offered by him for the purpose. This course is to last one month, and will be held in his lodging, No. 12 Rue des Bons-Enfants, on Mondays, Tuesdays, and Wednesdays, between 7 and 10 p. m. (to begin the 16 Ventôse†). Persons wishing to take the course are invited to register their names at the hours indicated, three days before the lessons are advertised to begin.—Paris, 20 Pluviôse, year XI."‡

We do not know that this war game met with great success among officers of the Army of the Rhine and the Army of Italy. Be that as it may, the game of war chess had very strong supporters and remained in favor for many years. The *Militärische Blätter* of 1822 speaks of it in the following terms: "One or two of these games introduced into the military schools would serve a most useful purpose. They would enable the pupil to learn in a rapid, amusing, and interesting manner a great many important tactical and strategical rules, and impress them upon their minds in a deeper, clearer, and more precise manner than long fatiguing lessons or lectures, listened to with indifferent attention and quickly forgotten. * * * ."

Marshal Ney expressed his opinion in the following manner: "I consider it the best school of our profession, and I should like to see it introduced into the military schools and large garrisons."

General Moreau said: "I see very clearly that one may learn from this game what can be learned of war in books; it should be introduced into all military schools." (See Löbell Jahresberichte, No. 1, 1874, p. 721).

Venturini's war game is, in its main features, a reproduction of Helwig's invention; but the rules concerning the

* December 30, 1803. † March 6, 1804. ‡ February 9, 1804.

conduct of operations, summed up in the work of Von der Goltz (Rosbach et Iéna), merit quotation:

"The war begins on the edges of the sheet; each side receives a number of pawns equal to half the number of squares on the board. The pawns are brigades, two-thirds of the pawns representing infantry, one-third cavalry. There is one field battery for two brigades of infantry, and one horse battery for three brigades of cavalry.

"Siege batteries, convoys, provision wagons, and bakeries are distributed in certain proportions which, however, are not those governed by war conditions.

"Footbridges, scaling ladders, rows of fascines, earth parapets, passageways, and magazines are represented by an endless quantity of pawns of different sizes.

"The war is divided into expeditions, each expedition comprising forty-eight operations at the rate of four for twelve months.

"In cities, however large they may be, there may be stationed only half as many pawns as in the fortresses.

"In open country, movements in winter may be made only under certain conditions. If a movement requires three days in January or February, it is considered half lost.

"Supplies and rations are represented, carried along, or consumed; communication with the base of supplies must always be maintained. If a column finds itself in a city, the bakers of the city supply it with bread. A brigade column has no right to carry anything away. In a market town or village square, bakers are not required to bake in any one day more than enough bread for a brigade."

Rules without end are fixed for the moving and fighting of a column.

General Von der Goltz concludes thus: "The whole resembles very closely the game of '*poste et de voyage*' in vogue a few years ago, where, upon making an unlucky throw of the dice, one tumbles into a swamp, or breaks an axletree, or experiences some other such mishap. Assuming a beginner in the study of the science of commanding an army, Venturini hopes thus to render clear his confused and perplexed ideas on the progress, the correlation, the origin, and the results of great operations.

"This war game is a bad product of the refined military education of the period, which had piled up so many difficulties that it was incapable of taking a step in advance."

The games of Helwig and Venturini bear a strong resemblance to each other, and represent the type of war game which, at that epoch, all inventors of analogous systems adopted with more or less modification.

But one of them, Giacommetti, a Genoese lawyer, in 1801, dedicated to Napoleon Bonaparte a new war game of quite a different character.

The battlefield is represented by a chessboard, with 152 divisions, alternately black and white, and divided into two parts by a river 9 divisions long and 1 division wide.

Within the first two lines of divisions is constructed a fortress of nine bastions and a citadel, to capture which is the player's object.

The armies are composed as follows:

For the defender.—One general stationed in the fortress, 2 foot soldiers, 2 cannon, and 1 mortar;

For the assailant.—One general in chief, 1 lieutenant general, 2 generals, 1 general of cavalry, 4 cavalrymen, 8 foot soldiers, 2 cannon, and 1 mortar.

Each party has, besides, 8 trenches, 4 bridges, and 4 ladders.

Disposition of all the pieces having been made, the game begins and the sides move pieces alternately.

The foot soldiers march in all directions, two steps forward and one step to the right or left or to the rear; but they can not cross a division swept by the fire of a hostile foot soldier or of a superior piece; they may attack a piece which opposes them on condition only that this one may be counter attacked by another piece. * * *

The cannon and mortars fire without moving, the latter delivering high angle fire. Cannon fire is made effective a distance of 4 divisions of the board, but it can have only one objective. One may make use of a cannon captured from his adversary; but if it be impossible to take it away, it must be either spiked or thrown into the river. * * *

Special rules bear upon the passage of the river, the establishment and defense of trenches, the attack of the fortress by means of approaches with a view to breaching, the employment of scaling ladders, etc. * * *

Finally, prisoners may be exchanged, and provision is made whereby a pawn for performing an act of special bravery may be advanced in grade. The private becomes a general, then lieutenant general, etc. * * *

These first attempts need no commentary, but the idea which they embody stands out boldly against this background of balderdash, and under an altogether new form will reveal the advantages that may be drawn from its more rational application.

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SECOND PERIOD.—THE WAR GAME.

The rules and methods of procedure, which First Lieutenant von Reisswitz published in 1824, remained the fundamental type of war game until 1875.

Although at the beginning of the second period the war game presented itself under an entirely new form, altogether different from that of the chess war game, the influence of the latter was still powerful enough to attach to the new game special and well-defined rules of play, and to preserve the name of game.

Its transformation, however, was radical; for the different colored squares representing the terrain was substituted a map; and, in place of conventional figures indicating the different arms of the service, use was made of pawns representing organic subdivisions and constructed to the scale of the map used, viz, $\frac{1}{8000}$.

A strong imagination and much labor were needed to codify a set of rules capable of meeting all requirements of the special cases which a military operation might present, and to present as close a resemblance to combat as possible.

It is to Lieutenant von Reisswitz that all the honor of this codification reverts, while the transformation of the game itself was the work of his father, counsellor of the War Department and of the public administration at Breslau.

The *Militär Wochenblatt* of September 9, 1874, in an article said to have been inspired by high authority, relates as follows how M. Reisswitz's war game became known at the Prussian Court and the favorable reception there accorded it:

"In 1811, von Reiche, a captain of the corps of cadets at Berlin, was giving lessons in fortification to Prince William (later King William I.) and to Prince Frederick. One day he spoke to them of the new war game and advised them to study it, though its inventor, M. Reisswitz, did not belong to the army. At the desire of the princes, their tutor, Colonel von Pirch II.,

had the war game installed in the castle at Berlin. The terrain on a scale of $\frac{1}{2^3 7^3}$ was modeled in sand; the troops appeared as squares of wood upon which conventional signs had been pasted. The game quickly interested the two young princes, and, struck with the advantages which it presented, Colonel von Pirch authorized them to speak of it to King Frederick William III. The latter expressed a desire that the game be shown him, but M. Reisswitz declared that he never dare present a box filled with sand to His Majesty, and asked for a little time in which to represent the terrain in some more satisfactory manner.

"The King had almost forgotten the incident when, the following year (1812), M. Reisswitz's war game was presented to him in its new form. The terrain was modeled in plaster, in relief, and woods, villages, roads, and water courses were represented in colors, and little porcelain cubes represented the troops. The entire arrangement was made with special care, and it greatly pleased the King, who had it taken to Potsdam. Matches were organized which were very successful, and the signal favor bestowed upon it by the King exercised a happy influence on the future of the game. Later, in 1816, when the Grand Duke Nicholas came to Potsdam, the King spoke to him enthusiastically of the new invention; matches were got up in honor of the Grand Duke, who gave himself up to it with extraordinary ardor; and the following year, when Prince William visited the Court of Russia, a war game was improvised at Moscow by joining several card tables together and tracing the terrain thereon with chalk."

During this time, Lieutenant von Reisswitz eagerly pursued the task of drawing up rules for the game and endeavored to popularize it among his companions. Already, in 1816, at Stettin, where the Second Brigade of Artillery was stationed, several matches had taken place; and it was proved to answer just as well for the study of a battalion in action as for the operations of several army corps.

In 1819, Von Reisswitz was transferred to Berlin, to the Second Regiment of Foot Artillery of the Guard, and his ideas were shared by several officers who diligently applied themselves to the war game. They met at least once each week; the number of adherents increased, and it was then possible, thanks to the cooperation of all, to experiment thoroughly and to improve the rules which had been used. The one thing which

did not satisfy Von Reisswitz was the word "game;" but not finding anything to take its place he retained it.

In January or February, 1824, the Prince Royal, then commandant of the III. Army Corps, heard this war game spoken of and invited Lieutenant von Reisswitz to explain it to him. The latter hastened to accede to the request and obtained authority for several officers well acquainted with the rules of the game to accompany him. After a very short lecture they played a match in which the Prince took part, and he was so keenly interested that he promised to speak of it to the King and to the chief of the general staff, Lieutenant General von Müffling.

Reisswitz then decided to publish his brochure, which bears the title "Instruction pour la représentation de manœuvres tactiques avec l'appareil du Jeu de la guerre."

A few days afterwards he was summoned to wait upon General von Müffling. Accompanied by the same officers who had gone with him to the Prince Royal, he called upon General von Müffling and found him surrounded by his staff officers. When Reisswitz entered, the General, addressing the latter, said: "Gentlemen, here is Lieutenant Reisswitz, who comes to show us something new." Without allowing this somewhat cool welcome to affect him, Reisswitz began by unfolding his maps. In great astonishment the General exclaimed: "Why! is your game played on real maps instead of a chessboard? Let's see, can you represent anything like the assembly formation of a division with your pawns?"

"I pray your Excellency," replied Reisswitz, "to state the general hypothesis and the theme of a maneuver to be executed on this map, and to designate two of your officers to exercise the functions of leaders. The only condition I impose is that each particular theme may contain only such information of the adversary as may conform to reality." General Müffling after a few moments' reflection did as requested. Each leader was joined by one of the officers familiar with the game, who had accompanied Reisswitz, and at the conclusion of the match the chief of staff exclaimed: "Why, this is not a game, it is a veritable war school! It is my duty to recommend it to the whole army."

He kept his word, and the *Militär Wochenblatt*, No. 102, of March 6, 1824, published the following note: "For a long time efforts have been made to represent the operations of war in

an interesting manner that should at the same time permit of discussion and instruction, and the different productions have been designated war games. But these games presented great difficulties of execution and bore no resemblance to the operations of war.

"It is somewhat astonishing, however, that these efforts should have been made by persons not connected with the army, which explains why they have not been able to imagine combinations which would occur in military operations, and for that reason their work could not satisfy experienced officers.

"Finally, an officer busied himself several years seeking to perfect these plans; he has completed and simplified an idea originating with his father, Counsellor von Reisswitz, and he has succeeded in representing with simplicity and reality the combinations of war.

"Whoever understands the art of war can, in this game, fulfill the functions of a commander of troops in greater or less bodies, even if he does not know the conventions adopted and has never seen the game played.

"By practicing on good maps, representing a real terrain, and changing them, it becomes the more instructive, because it permits of a variation in the dispositions to be made and the orders to be given.

"I shall endeavor by all means at my disposal to increase the number of maps now existing.

"Although Lieutenant Reisswitz has already been rewarded for his work by the approbation and encouragement which have been accorded him by the princes of the royal house, the minister of war, and officers of high rank, who have become acquainted with his war game, he will receive besides the thanks of the entire army when his invention shall have become known and appreciated by all.

"VON MÜFFLING.

"BERLIN, *February 25, 1824.*"

It would be difficult to praise the war game in warmer terms, and the year 1824 may be fixed as the date of its real invention and introduction into the Prussian army. By a cabinet order the King directed that each regiment be supplied with one of these war games, and Lieutenant Reisswitz was kept constantly engaged in superintending the manufacture and publication of new maps to the scale of $\frac{1}{8000}$.

Before giving a sketch of the rules of the game we shall conclude the biography of Reisswitz by summarizing an article which appeared in the *Militär Wochenblatt*, No. 56, 1874. It is from the pen of General of Infantry z. D. Dannhauer, who was very much attached to him and took part in his work under circumstances that have already been mentioned.

The Grand Duke Nicholas of Russia, having received some details of Reisswitz's invention through Prince William, expressed a desire to have Reisswitz come to St. Petersburg in order to learn the game from him. He was admirably received there, had the honor of being presented to the Emperor Alexander, and occupied a prominent position at court, where he remained during the entire summer, returning to Berlin in the autumn with the Grand Duke Nicholas, who went there to pass the winter. A war game was then organized, with the Grand Duke and the Prince Royal as leaders, and the country between the Elbe and Oder for the field of operations, contemplating a decisive battle at Bautzen. The theme was formulated by General von Müffling, who, with the assistance of Reisswitz, acted as director or umpire. The matches took place once or twice a week, and frequently the King and princes attended them as well as the generals and colonels of the Berlin garrison.

The example set by such high authority was immediately followed. At Berlin, the Artillery Brigade and the Second Regiment of Foot Artillery of the Guard formed societies to play the game, and many officers of other regiments and of the war school came to take part in it. The latter introduced the war game into the country garrisons.

Field Marshal von Moltke, then (1828) a lieutenant, was an industrious player, and later, as chief of staff of the IV. Corps, at Magdeburg, he exerted his full effort to promote the war game, which he considered the best means of spreading and perfecting instruction among the officers.

In 1825 Marshal Marmont visited Moscow as an envoy extraordinary at the coronation of the Czar Nicholas. He stopped a few days in Berlin with his brother-in-law, Count de Saint-Priest, the French ambassador. Expressing a wish to see the game played, he was present at a match and was enthusiastic over it, declaring that it was the happiest invention of the period and that he desired to introduce it in the French army.*

* A manuscript translation of Reisswitz's work was submitted to a committee of the French general staff in March, 1829.

General Dannhauer having thus shown the high esteem in which Reisswitz's invention was held both at court and in upper army circles, adds: "One might believe that this game, which has so much intrinsic value, which was so thoroughly approved, and was publicly presented under such favorable auspices, would have met with a hearty welcome everywhere. But it was not so. It immediately encountered strong opposition from those who claimed that practicing the war game would necessarily injure the young officers. 'If you make them conduct brigades and divisions,' they said, 'they will get an exaggerated idea of their ability as generalissimos and will consider the details of company duty very much beneath them.'

"It is not necessary to refute such an assertion.

"All the incumbents of our high commands played the war game when they were lieutenants, and no one can assert that it increased their pride, nor charge them with not strictly fulfilling all their duties as company officers. *But the fact which deserves particular attention is that by its practice when they were lieutenants, they acquired studious and industrious habits which they have retained—habits essential and indispensable to those invested with high command.*"

But Reisswitz became a target for all the discontented and envious, and every possible means was employed to injure him in the eyes of his superiors. His liberal and upright character, his lively, impulsive nature and buoyant spirits excited remarks and criticisms which, instead of being considered simply as whims of no importance, were reported with exaggerations and elaborations to his superiors. They even went so far as to accuse him of intemperance, a fault which he never had.

To be brief, he was appointed captain in 1826, but instead of being assigned to the artillery or the guard he was sent to the Third Brigade of Artillery at Torgau. Looking upon this as a disgrace, he took himself to be completely ruined and committed suicide in 1827.

If his work was not perfect, it contained, nevertheless, a correct and practical idea; and, consequently, it has survived.

We shall now examine, in a general way, this first form of war game, following the directions of Lieutenant Reisswitz.

The war game is the representation on a map, of a maneuver of a battle, with the aid of pawns denoting the different arms of the service and subdivisions of troops employed.

The map should be on a large scale, so as to admit of the representation of the smallest accidents of the terrain, with a view to their use during the battle; the scale adopted is $\frac{1}{8000}$.

The pawns, which represent the troops, are little squares of lead, painted red for one side or party, and blue for the other. They are made to the same scale as that of the map used, and the conventional signs they bear represent the different arms of the service and indicate the numerical strength of the organic subdivisions.

The necessary outfit comprises dice, dividers, and scales of distances and ranges.

The number of players varies with the number of the subordinates attached to each side, but the minimum is three—two leaders for the sides and an umpire.

The decisions of the umpire are final, and must be immediately carried out. The umpire's action must not be questioned during the course of the game, and neither objection nor discussion is permitted until after the conclusion.

The umpire should see to it that the troops are moved in accord with the spirit of the orders and drill regulations for each arm, so that the players shall become familiar with them and appreciate the time necessary for the various evolutions. He must be apprised of all intended secret marches, concealed movements, ambuscades, etc., in order that he may be able to control their execution and avoid all improbable situations. He requires the players to maintain silence; all orders, reports, and information should pass through and be transmitted by him at the desired time, to the parties addressed. He is also charged with communicating to each leader such information as in his judgment is supposed to come from patrols and other sources.

An important factor in every action is the estimation of the time necessary for its different phases. To attain this result, and provide means for controlling the duration of movements of troops, and to estimate the losses sustained on both sides, the time during which an action develops is divided into rounds (*zug*) of an invariable duration of two minutes each. It is therefore necessary to distinguish between the real hour and the imaginary hour, or hour of battle resulting from the number of rounds elapsed; these evidently differ, for to study a round requires perhaps five or ten minutes of actual time.

Before assembling the players around the detail map to be used, the umpire sends or gives to the leaders a general hypothesis and special themes. The general hypothesis contains all the information which each of the leaders ought to receive as to the projected operation and the general situation, and should be such as to bring about the contact of the troops on the terrain embraced by the map. The special themes derived from this hypothesis are given only to the leader of the interested party, and contain information concerning the strength and composition of his force and its mission, besides such knowledge as in reality he would be able to possess concerning the enemy.

The leaders will always act according to the spirit of their orders and avoid construing them literally.

During the progress of the match the players will be careful to make the best possible use of their troops under all circumstances. They must become familiar with the functions of each arm, and the dispositions they make will be a test of their knowledge. The evolutions on the map should be the same as would be executed on the terrain under similar conditions; in the presence of the enemy the simplest and most rapid maneuvers are always the best; *complicated movements are excluded from the war game, as they ought to be from the drill ground.*

Having received the general hypothesis and his special theme, each leader prepares his written orders and delivers them to the umpire. From information they contain the umpire is enabled to establish the initial situation of the maneuver, which then begins on the war game map. Only the troops actually visible at this moment are represented on the map. Detachments, patrols, etc., are represented only as they become visible to the enemy or to his reconnaissances. In the latter case, account must be taken of the time required for information gained to be transmitted to the leader, whose position on the map should always be indicated, and pawns representing troops thus discovered should not be put in position until this time has elapsed. The same provision is applicable to the transmission of orders, and a commander can not communicate orally with subordinates who are more than 1,000 paces from him. When a leader changes position, the time necessary for the change is likewise considered.

The original disposition once established, should the umpire see that the contending parties are still too widely separated

to permit of an engagement, he directs several movements to be made simultaneously; thereafter, the troops once engaged, the game proceeds regularly, round by round. Each side causes its troops to execute such movements as are possible during the round of two minutes; then the umpire determines by means of dice the total losses, which he registers separately for each side. In order to render the losses apparent, pawns belonging to each player are withdrawn, and others of less value are substituted, according to established rules.

The game proceeds thus until a positive result is obtained or until the umpire sees fit to stop the match. In the war game, the author adds, it is not a question of winning or losing, as in cards or chess; this would not be an imitation of the operations of war; the well-grounded decisions of the umpire and the approbation of one's comrades are the only possible rewards. Whoever best follows up his movements, adopts the simplest and most natural means to the end, and departs the least from the general idea of the operation, will have won the match, even though he may have lost a few more pawns than his adversary.

Provided two or three officers of a regiment have taken the trouble carefully to study the rules, play may begin immediately; the others will learn the rules by merely observing the game.

The best way to learn the game is by commencing with simple subjects, as by placing a few pawns on the map and, on nearly level ground, executing movements to familiarize one's self with the rules, gait, distances, and intervals maintained by the troops of all arms; the study of defensive and offensive positions, points favorable for crossing water courses, etc.

After having thus executed minor movements without the enemy being represented, practice with both sides represented may be had.

This preliminary work has for its object to familiarize the players with the use of the pawns, acquaint them with the theory of minor maneuvers on uneven ground against an enemy of superior force, and to give them practice in the drawing up and wording of orders.

If this progressive system is not followed, if one desires to plunge without preparation into the great operations of war, the risk of becoming totally confused is incurred, and much more time will be required to learn the rules of the game. It

is only after these first exercises and when one has become familiar with the procedure of the game that it will be advisable to divide it into rounds. If, on the other hand, the principles indicated are followed, officers who diligently study the game will not be slow in obtaining good results, the value of which will be quickly apparent in the regiments. The least of the advantages they will derive from it will be to acquire skill in reading maps, in the rational selection of movements best suited to the different arms of the service, in the choice of positions, etc. The interesting discussions which are sure to follow a match will be of incontestable value in the study of the military art.

It can not be denied that the war game, always interesting, will be more or less instructive and profitable, according as the umpire is more or less capable of making it progress regularly and conformably to the true principles of the art of war. His duties appear difficult and complicated; however, there are but few officers, who, with the necessary instruction, and a judgment never so little exercised, may not be able to identify themselves with and successfully fill this rôle.

A thorough grasp of the umpire's duties, and success in overcoming their inherent difficulties, will encourage officers to take this part as often as possible, for the game offers many opportunities of increasing one's information, of developing one's intelligence, and of exercising one's self in the comparison and estimation of other people's ideas.

Such are the principles of the war game invented by Lieutenant Reisswitz and his father. We shall by and by give attention to the other rules which they made use of in playing it; but before doing so, it is proper to point out the radical modifications made by them in the game, as practiced up to that time.

For the chessboard is substituted a map representing a real terrain, and the chess pawns, as well as their conventional movements, are set aside. Troops are represented by small leaden cubes which, constructed to the scale of the map, represent as exactly as possible the organic subdivisions of a regiment; and the only rules governing their movements are those which would actually apply to the troops themselves whether on the march or in action; and the end proposed is the solution of a well-defined tactical operation, under the surveillance and assistance of a director who is also judge and umpire.

It is a true object lesson in tactical instruction; it offers all the advantages of the study of a concrete case, requiring, on the part of those who engage in it, reflection, search of the means to attain a desired end, and a tenacity of purpose notwithstanding the active and constant opposition of the adversary.

The precepts relating to the orders to be given by the director, and the means set forth for the valuation of time necessary for the transmission of orders and information, are perfectly applicable to-day. We have the greatest admiration for the ingenuity and real talent displayed by the inventors in disentangling the war game from its original form by relieving it of conventionality, and in substituting for a game of chess masquerading as a war game, an exercise of real value when viewed from a tactical standpoint.

But this transformation, notwithstanding all its merits, is not perfect. If there be no fault to find with the first part of the instruction, the same can not be said of the second, which gives the detailed rules of execution. These rules are numerous and in too much detail, and confine the game within such narrow limits that they proscribe all freedom of action, requiring it to proceed, step by step, according to a series of rules, the application of which demands very long preparation on the part of the umpire; and they have the capital fault of not permitting him to base his decision upon his own tactical knowledge; but, instead, require him to use dice with their various combinations to decide the results of every action, every attack, and to determine the losses sustained by the troops engaged.

We shall not present an analysis of all the combinations nor of the rules which apply to them, for it would not be interesting; but we shall briefly indicate the principles upon which they rest.

In every action one of the parties appears to have a greater or less advantage over his adversary; the dice, which are used arbitrarily to adjust differences, are of two classes, favorable or unfavorable to the one using them, and according as they are used under the one or the other hypothesis, the result is more or less affected and the corresponding losses more or less severe.

There are seven dice, bearing on their faces special marks which permit the determination, among other things, of the

success or failure of an attack; if the latter, whether the assailant is simply forced to beat a retreat or is more or less routed; and, finally, the number of points or losses suffered by each adversary. The total of such losses for each party is then converted into real losses as follows: 25 points represent the loss of two pieces of artillery, 60 that of a squadron of cavalry, 90 of half a battalion of infantry, and 30 of a company of skirmishers.

Finally, numerous precepts are given to govern the use of troops of all arms under all circumstances of combat, even in night attacks, which seems like carrying it too far.

We shall here close this enumeration, for, without further detail, it is easily seen that it is the second part of Reisswitz's instructions which is the more subject to criticism. Certainly there were great difficulties to overcome, but to leave everything to chance, to a throw of dice, was not a happy solution. By not permitting the umpire to be guided by tactical considerations in making his decisions, the game was placed on the same level with an ordinary game of chance, where a single unlucky throw of the dice would cause the failure of a combination carefully prepared according to tactical rules.

Another very important point which narrowed the scope of the war game was the difficult functions of the umpire. To enter upon them it required not only a familiarity with all arms of the service and a knowledge of the mechanism of the game, but, above all, so thorough an acquaintance with all the complicated rules as to apply them without hesitation or error in cases as varied as would arise in war. Their study required a great deal of arduous work, which did not suit all those who should have possessed the qualifications of an umpire. He is, in reality, the soul of the game, and interest in it depends upon him so absolutely that many officers who had enthusiastically adopted Reisswitz's ideas quickly became discouraged, because the poorly directed matches dragged their weary length along without profit to anybody. Nevertheless, the war game had taken a rational form, suited to the end in view; all the modifications to which it was subjected applied to the rules and points of detail, but the execution itself remained as Reisswitz originally conceived it.

During the years following the publication of Reisswitz's work, and while he remained in Berlin, the war game made rapid strides. As we have stated, an order of the King

recommended the purchase of the apparatus to all bodies of officers; but the removal of Reisswitz to Torgau and his unfortunate end, in 1827, were detrimental to the progress of his invention.

It is only since 1860 that the war game has spread generally among officers. Up to that time it had been practiced only in clubs specially organized for the purpose in a few large garrisons. Among them the Magdeburg Club, which was so brilliantly managed by General von Moltke, ranked first. Only a few bodies of officers can boast of always having been adepts at the war game; but amongst them mention must be made of the officers of the Artillery of the Guard, to which the inventor belonged. Talented writers, convinced of the game's utility, continued, however, to give it attention, and foremost among them are Decker and Witzleben, who published instructions and new rules for its conduct. Then, in 1846, the Berlin War Game Club brought out the "Instruction pour la représentation des opérations militaires à l'aide de l'appareil du Jeu de la guerre." This work went through a second edition in 1855. Its authors remarked that, by reason of the revision and augmentation of the rules, it was possible to consider a greater number and variation of cases; the game represented more nearly the characteristics of battle. There was, therefore, a tendency to eliminate improbabilities. Rules relating to the estimation of the effects of fire were completed, assumed a greater importance, and were rendered more practical.

But if these modifications introduced certain improvements they at the same time produced other inconveniences; the rules became still more numerous and complicated, and a study of them and the practice of the game more difficult.

This work was the standard until 1862, when von Tschischwitz published a "Nouvelle Instruction pour le Jeu de la guerre;" he preserved the primitive method of Reisswitz, but adopted less complicated and more practical rules for computing losses. After a long period of peace, Germany had two wars which allowed all officers to become convinced of the necessity of familiarizing themselves with the operations of war. Consequently, after each of the campaigns of 1866 and 1870, there appeared a strong sentiment in favor of the war game, and in 1874–75 Lieutenant von Reisswitz's invention attained its complete development.

From 1862 to 1869 Captain von Tschischwitz's book of instructions passed through three editions; in 1869 there appeared a treatise by Colonel z. D. von Trotha, and this too passed through three editions. The latter revised the original rules with a view of giving a more exact representation of battle and of relieving the development of the game of the incumbrances which operated to narrow its scope. But this was simply to turn in a syllogistic circle, for, in seeking to prescribe definite rules for studying battle and rendering decisions in an infinite variety of cases, he unavoidably committed the error of his predecessors by constantly adding to the rules.

In 1872 the war game received a great impetus; and, as it was largely played, a great many umpires were required. Certainly there was no lack of officers capable of this function, but there were few with sufficient courage to study and assimilate the complicated rules governing the game. So a compromise was effected, whereby at first only a portion of the rules were preserved; in the end they were completely set aside and the management of the game came to rest entirely upon the extended tactical experience which the umpires had acquired in war. The result was that, while the absolute utility of the war game was recognized by everybody, a feeling existed that it would have to be greatly modified by stripping it of everything which smacked of a game, as the term is generally used—that is to say, by doing away with all decisions based on chance, and by preserving rules, or rather conventions, only for a general representation of the battle and by basing all decisions solely on tactical considerations.

This was the beginning of the third period. Before examining it, we ought to add a few historical details of the second period. Until now, we have considered the war game in its general features only as regards operations leading to battle and the battle itself. But an attempt had also been made to utilize it for operations absolutely special in character: the study of siege warfare.

A short time after the war of 1870–71, under the inspiration of the Prussian general inspector of artillery, von Hindersin, there appeared a complete war-game apparatus to represent attack and defense of fortified places. A little later, in 1872, there appeared "Directives pour le Jeu de la guerre de

forteresse," by Major Neumann. This instruction, as the title indicates, contained no rules, but was based upon purely tactical and technical data, permitting the fullest liberty of direction. It was received with great favor by the officers of artillery and engineers, and the general inspectors of these two corps extolled the study of it.

This special war game was studied with equal zeal in Austria. In 1874 an artillery and engineering review gave some details of Alph. Makowiczka's war game as applied to fortified places. Furthermore, it was in Austria that the game was received with the heartiest welcome. As far back as 1847 an article in the *Militärische Zeitschrift* had set forth all of its advantages; but it did not really spread throughout the army until 1866, when the methods in vogue in the German army were used.

After 1870 the game began to occupy attention in Switzerland and Italy. In Russia Captain Skougarefski's manual appeared in 1875 (see *Revue Militaire de l'Etranger* of 1875, Vol. VIII, page 270). The same publication had given an analysis of Colonel von Trotha's war game in the first half-yearly volume of 1872; and in the first of 1873 (Vol. VIII, page 57), a study of the instructions for maneuvering on the map ("Manœuvre sur la Carte," *) published by the commanding authority of the Italian Staff Corps; the instruction greatly resembled that of Colonel von Trotha.

Finally, in 1874, the Réunion des Officiers published a war game which gave an exact idea of the methods employed at that epoch. This was the first effort of the kind that had been made in France.

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THIRD PERIOD.—COMPETITIVE MAP MANEUVERS.

We now reach the last transformation of the war game. A radical transformation it was, too, for its object was completely to suppress all the minute and complicated rules which the umpire had to consider in rendering his decisions, and to substitute for them full liberty of action: that is to say, a liberty based solely upon tactical considerations.

*Official name given to the war game in Italy.

This evolution is characterized, in Germany, by the following works of Lieutenant Meckel, a professor in the war school at Hanover:

Études sur le Jeu de la guerre, published in 1873;

Instruction pour le Jeu de la guerre, 1875;

and also by the brochure by Colonel von Verdy du Vernois, chief of staff of the I. Army Corps, which appeared in 1876 under the title of *Études Complémentaires sur le Jeu de la guerre.*

In his works Lieutenant, since Captain, Meckel echoed new tendencies; he understood the need of a complete change in the methods of playing the game, but as yet he had not the courage to attempt an open rupture with what were then the accepted principles. The central idea of his instructions, remarkable in many ways, was to emancipate the umpire from all rules; but, as on the other hand, it imposed upon him the necessity, above all, of taking into account the losses by fire in his decisions, so it still preserved a set of rules for estimating them, and the dice and tables of losses.

The work of Colonel von Verdy du Vernois cut loose entirely from the past; he accepted neither rule nor table. "The war game," said he, "should be conducted on the same principles as staff journeys, for the military results sought by the two exercises are identical. Now, in staff journeys nobody ever had an idea of deciding the success of an operation by the throw of dice; the umpire made his decision from his own standpoint, and it should be the same in the war game."

The appearance of these works has produced a new evolution of the war game, and we shall consider them successively.

MECKEL'S IDEAS ON THE WAR GAME.

Meckel's "Étude sur le Jeu de la Guerre" began by showing the great usefulness of the exercise in the instruction of officers charged with leading troops. The first part is a very fair and spirited plea in its favor. It is addressed, though the author carefully avoids saying so directly, not only to its opponents, but to indifferent persons, who are the worst enemies of all progress, of all work, for they reject deliberately and without previous examination every idea which tends to arouse them from their stupor or lift them out of the routine into which they have fallen.

Meckel justly praises the intellectual movement in the German army—note the fact that he wrote in 1873—but observes that such a movement ought to be skillfully guided along a new path. Up to that time theoretical studies, and those of military philosophy as set forth in the writings of Clausewitz, had been in special favor, and all the more because they were particularly suited to the German habits of mind. But the great events which had just happened proved that the study of purely theoretical manuals was not sufficient for officers whose instruction demanded practical means for its development, and that the only means was to study concrete cases, drawn from the experiences of war, as set forth by Colonel von Verdy du Vernois in his *Étude sur la conduite des troupes.*

This method gives the best results, for it concentrates the mind on a single well-defined case, and brings into requisition for the solution of a tactical problem all the knowledge an officer has acquired in his theoretical studies. It is at the present time in use throughout the German army. Its employment in connection with field exercises, grand maneuvers, and staff journeys assures the practical instruction of the officer under the most favorable conditions; but there is one faculty which it can only rarely develop within him, and that is the spirit of the initiative and of prompt decision.

Officers who during maneuvers command large units, as well as staff officers, have, it is true, opportunities of developing that quality; but the others, and they form the great majority, never have a chance to exercise functions higher than those of their grade, to have separate command, and hence, to train themselves in the forming and executing of prompt decisions.

There is only one means to supply the deficiency, and that is to practice the war game.

Still we must recognize the fact that those who have most to gain from it—officers of the line—are precisely the ones who display the greatest opposition to this sort of study.

It is recognized that its practice presented only a limited attraction as long as it was characterized by the metaphysical military ideas of the century, and by the fact that its management, such as it has been in the past, presented an obstacle to its development. But during the fifty years it has been in existence it has been much improved, and when the task of

the umpire shall have been simplified by removing the restraints of useless and even harmful rules, the war game will become the foundation itself of the instruction of officers.

Permit us to point out the principal advantages among the many it possesses.

First.—It presents all the usefulness of an object lesson; for the troops, being really represented to scale, can be followed in all their movements in their march toward the enemy and in battle; even the use of the ground may be taken into account, and the service of one arm or the combined action of the three arms is faithfully represented. Moreover, the officer, who during the maneuvers generally has only a very limited horizon, frequently confined to the unit of troops he commands, may gain an excellent idea of the ensemble of a battle and of the different phases which characterize it; and it is not one of its least advantages, testified to by many well-informed officers, that practice of the war game facilitates their tactical studies and especially the study of military history, for they acquire the habit of rapidly comprehending the course of a battle in all its essential features, while formerly they succeeded only with difficulty in grasping the ensemble, and then not clearly.

Second.—It constitutes a constant exercise in the conception and wording of orders. Nothing is more difficult than to give an order; nothing more important than to word it properly. If an order admits of misinterpretation, one may be sure that it will be misinterpreted. Orders too much in detail destroy the initiative of subordinates and prevent them from making dispositions suited to the situation and the intention of the enemy. Orders too general in their nature, and without any indication of a well-defined purpose, are not sufficient to stimulate an overcautious, hesitating junior; and they might lead an enterprising character to act separately and not in harmony with the main object of the operation. Orders that are not precise will not be executed with precision, and an order that is too long will stifle interest.

Every error, every mistake in the wording of an order, leads to waste of effort and sometimes even to useless sacrifice of life. Nothing but long experience in wording orders will prevent these errors, and nothing gives this experience so well as practicing the war game, provided that we take into account the exact time required for the transmission of orders, that

all information pass through the intermediary of the umpire, and that all conversation between the leaders and their subordinates be strictly forbidden. Finally, it teaches (and this is an essential point, too) how to adapt orders to the character and ability of the officer for whom they are intended. The form adopted to excite and stimulate an indifferent subordinate would not answer for an ardent audacious spirit which it might be necessary to hold in check to avoid an excess of zeal. To an energetic and well-balanced commander it will suffice to point out the desired end, while to a hesitating character must be given more detailed and precise instructions.

Third.—In order that they be well executed, it does not suffice that orders be well given, they must also be well understood. This double result will be reached only by constant practice; the junior will learn to grasp his superior's idea from a word; he will learn to divine it when, as often happens in the critical situations of war, a commander can only express it in a manner somewhat imperfect or vague. The junior will learn likewise the habit of conforming to the will of his superior, in the sense that, although he may appreciate a tactical situation from an exactly opposite standpoint and consequently see a different means to overcome its difficulties, he still makes the ideas of his superior his own, just as if they had proceeded from himself, and carries them out with ardor and fidelity.

Fourth.—Very often in the field the commander will arrive at his conclusions by studying the map. In the preparation for marches, or the disposition of a system of outposts, a complete preliminary reconnaissance is out of the question. The main outlines are based on the knowledge gained from the maps available; and, in this point of view, the war game is a useful and instructive exercise.

Fifth.—From a tactical standpoint there is nothing known which can replace it; it presents even certain advantages over field maneuvers.

Every person possesses to a greater or less degree the faculty of making a prompt decision and carrying it through to conclusion; but, in order to make a proper decision, it is necessary to have knowledge and to be conscious of that knowledge. Knowledge does not consist simply in *acquiring facts*, but rather in the *utilization* of them; the first is accomplished by study, but practice alone secures the second qualification; the

war game supplies the means of acquiring and perfecting them. With the exception of maneuvers, it is the only exercise in which a commanding officer has only an imperfect knowledge of the enemy upon which to base his judgment, and sometimes he is not even possessed of that knowledge. Let us bear in mind there is no such word as "certain" in a campaign; there will be nothing but very imperfect information concerning the enemy, and it will be necessary to act entirely upon probabilities. Nothing but constant practice will accustom one to the difficulties of a situation; and, in war, where a commander finds himself face to face with the unknown, the gravest fault with which he can be reproached is indecision; therefore he must acquire confidence in himself by solving problems simulating war conditions, in order that he may act with that knowledge and will power necessary to avoid being overawed by the will of his adversary.

When it is well managed, the war game is capable of giving the most exact representation of what will occur in a campaign. If each leader has received only the most indispensable information concerning the enemy, and if, moreover, in the progress of the match care be exercised by the two sides to place upon the map only the troops really visible, this exercise becomes even superior to maneuvers. The unknown in it is really more of a factor than in the latter, for in these one always knows, at least very nearly, the strength of the adversary, either through the list of troops engaged in them, or by the cantonments occupied, or, above all, by means of orders which must be issued to modify the initial situation and which always become matters of public information.

But it does not suffice for a commander merely to make a decision—it is further necessary in every operation of war that he pursue it to the very end if decisive results are desired; and this qualification is very difficult to acquire, for as soon as contact with the enemy is gained, he finds himself confronted with a will opposed to his own.

In such a case it is best to persevere in first intentions and so far from being influenced by the menaces of the enemy, on the contrary, the attempt must be made to thwart his will; and it is through tenacity of purpose under such conditions that the object of the battle will be accomplished. To acquire all these qualifications practice is necessary; grand maneuvers do not last long enough, moreover the unknown is almost completely eliminated, and the employment of the war game is the only way to develop them.

Sixth.—We must not forget, either, that in war the best dispositions may be rendered ineffective by those of the enemy; success is often fickle, fond of chance, of the extraordinary, but it is above all hostile to type dispositions, to fixed rules proceeding from an unintelligent and irrational application of regulations. The study of concrete cases is the only method to be employed in convincing an officer that formulas and schemes are to be mercilessly rejected, that all situations in war are special and exceptional, and that decisions and dispositions suitable to them can be made only by an exercise of judgment and good sense acquired by the diligent study of general principles. Good judgment is acquired by exertion and the rational and intelligent discussion of concrete cases.

Now, the war game offers this considerable advantage—that after it has served as a true object lesson it admits, once the practice finished, of a full discussion of the different phases of a battle, and gives to all, umpires and leaders, an opportunity to exchange their ideas and opinions.

If all discussion be absolutely prohibited during the course of the match, it should, on the contrary, be encouraged in every way after its termination.

The umpire, after having summed up the premises of the operation, points out its salient features, and these only, beginning with the orders by each leader, and gives the reasons for his decisions. Once the match finished, each participant is at liberty to approve or disapprove of them, but in the case of disapproval the reasons therefor should be stated. There follows an interchange of ideas and criticisms which become a general source of instruction, so much the more useful as each participant draws from them lessons suitable to his own mind and temperament. The more these differ the wider the range of discussion, giving rise sometimes to diametrically opposite conclusions.

Suppose, for example, that in the course of a match the umpire decides that an attack has failed. His decision is immediately accepted without the shadow of a protest, but after the match the opinion of a progressive and high-spirited person would be something as follows: The attack ought to have been led more rapidly, time was wasted in maneuvering, waiting for reserves, in preparing the attack by fire action; if the attack had been rigorously pushed at the beginning the enemy would not have had time to make disposition to meet it.

On the other hand the views of a calm methodical character would be: The attack was premature, the attacking force was too small, and the fire preparation should have been more complete.

So far as these two opinions concern the personality of those who utter them, they are equally exact. Everyone can not draw the same conclusions from or make the same application of theoretical principles; each formulates action agreeably to his individual conceptions. It is for this reason that the discussions which follow a war game match are so interesting; the different and even contrary opinions which are expressed tend to a broadening of thought, shed new light upon the subject, and from this standpoint the game is superior to maneuvers.

In general, what constitutes a criticism following a maneuver? Simply, an officer of high rank gives his opinion, and everybody is obliged to accept it without a word.

Nevertheless it is the discussion that above all is instructive. Objection will be made, perhaps, that the umpires are present to adjudicate *de visu* the different incidents which can arise during a battle; but the umpires can not be everywhere just at the desired moment, and they have not time to give tactical reasons for their decisions.

Seventh.—Finally, the war game is the most effectual means to develop a taste for study. Every officer who practices it will quickly perceive his deficiency of knowledge and set about to remove it. In this manner he will become familiar with organization, tactics, and the method of using different arms; he will become acquainted with the composition and functions of the different arms of the service, with subsistence, convoys, reserve supplies of munitions, etc.; also such special works as construction of bridges, passage of water courses, putting positions and localities in a state of defense, etc.; all of these will become equally familiar to him.

Moreover, the formulating of hypothetical cases and appropriate themes furnishes the officer so engaged ample occasion for very interesting and instructive occupation. This work should not be confined to the umpire; all officers should take it up and serve in that capacity. Lieutenants should give elementary tactical themes to their noncommissioned officers, and if they are faulty in conception or badly worded they either can not be executed or will be useless as a means of instruction.

The same course should be followed with reference to the criticism. All should be successively detailed for that rôle, and from it the greatest profit will proceed. They will learn to review from memory the general trend of the battle; to seize upon and bring out the salient points, and, above all, school themselves to do it in a manner so tactful as to avoid wounding the most sensitive feelings. Criticism should always be characterized by kindness and good will, and although it is necessary to draw attention to errors committed, equal prominence should be given to points of merit and excellence; otherwise it would destroy the self-confidence of every officer, a quality without which neither decision nor initiative is to be expected.

War-game matches should always be conducted in a spirit of good will and comradeship, and the development of these conditions will be quite as valuable as the instruction imparted; through them the officers will become better acquainted and learn to appreciate one another; true talent will be rapidly brought to light; superficial talents will fail under the test; the timid character, taking confidence in himself, will overcome his hesitation and learn to act; one inclined to self-sufficiency will learn moderation, and, being less sure of himself, will recognize things which he has yet to learn.

Moreover, it gives an officer an opportunity to prepare himself for the functions of a higher grade. In time of peace the lieutenant is occupied only with the affairs of his section. In time he becomes a captain and perhaps will have, in case of war, suddenly to assume the responsibility of commanding a separate battalion, with detachments of other arms. What will he do without having beforehand prepared himself for such a command?

Nothing can take the place of the war game; it even possesses advantages over maneuvers which we have pointed out, and is, to our mind, the best means of instructing officers, especially the young officers of the line; it is instructive, and inculcates a taste for study, which is absolutely indispensable, in proportion to advancement in grade.

In the second part of his work, Meckel asks if the war game is as widely spread as it ought to be.

His negative answer he attributes to the fact that the game presents imperfections calculated to repel many who are inclined to favor it.

The principal faults observable, he says, are the following:

First.—The decisions of the umpire must conform to a set of fixed rules which almost totally exclude tactical considerations.

Second.—The employment of these rules always produces numerous improbabilities, because they are not adapted to all cases, and every operation of war has its own peculiar features.

Third.—The reckoning of losses by the enemy's fire causes the game to drag along slowly and uninterestingly; and the time required to make calculations is absolutely lost, for these results have only a feeble influence on the decision of the match.

Fourth.—The instructions in their present form have much more to do with the memory than with the tactical knowledge of the umpire. Whoever wishes to fulfill the functions of that position is obliged to learn these instructions, and their complication and multiplicity discourage those with the best intentions.

This last is the gravest defect, for there is a general lack of clever and competent umpires.

We need new instructions for the war game, which will admit of any officer acting as umpire without the aid of special rules and guided entirely by tactical considerations.

But there is one important factor which must henceforth be carefully considered, and that is the estimation of the effects of fire. It is necessary, says Meckel, that at any moment of the combat the director be able to determine the losses sustained by the columns engaged; this is dependent upon many things, such as the favorable or unfavorable position of the firing lines, and the greater or less view had of the enemy; whether the forces are sheltered or exposed, and finally, upon the distance separating the combatants. A determination of losses based upon such factors will serve as a basis for the umpire's decisions, as it will enable him to avoid the incongruities of the past, when tactical considerations were abandoned and the mere turn of the dice served instead to decide whether an infantry column advancing under fire could or could not continue its advance.

By taking the effects of fire as a basis of his estimate, the umpire will have a means of exactly valuing the remaining strength of a column in accordance with the losses it has sustained: the column may still retain its full moral strength,

even though it experience relatively severe losses, provided those losses extend over a considerable space of time; it may lose all of its enthusiasm and dash if these same losses occur in a few moments. These are important factors to occupy the attention of the umpire after the forces are once engaged; the estimate of fire effect alone will enable him to determine whether any particular column is still capable of advancing, and to decide which side has the resultant advantage.

In the last part of his brochure, Meckel defines the different kinds of war game.

If it be desired to estimate the effects of fire in all its details, it is not necessary to exceed a certain total strength. Until the present time there were allowed, for this purpose, a strength of from three to seven battalions, which are a great deal too many; for, if fire preparation is made with care, if account be taken of present combat formations, almost entirely in dispersed order, the umpire would have to decide on the action and losses of from 20 to 40 sections of skirmishers on each side. For one desiring to do the work with care, this is an absolute impossibility; moreover, it would cause the match to drag wearisomely along, and a single evening would not be sufficient time to consider a battle in its entirety.

Each time a force acts by fire action the umpire should weigh the situation and decide as to its efficacy. The losses should be carefully registered for each company, squadron, or battery, for every command acting independently, whatever be its strength, and in decisive moments it is necessary to calculate the losses even for every $\frac{1}{4}$ or $\frac{1}{2}$ section.

We must break away from the false idea that the study of large bodies is more instructive and interesting in a battle than that of small units. By the employment of the three arms and their combined action, the progress of a battle can be just as well studied with a detachment of one battalion, one squadron, and a few batteries, as with a brigade or division; and, besides, the study of a small detachment is more instructive to the greater part of the officers, for it admits of entering into the smallest details.

A match should never last longer than three hours if it is desired to indulge in an instructive discussion, for this is the extreme limit during which attention and interest can be maintained. The infantry employed should not exceed a

battalion; as to the proportion of cavalry and artillery, it may be a little greater than above indicated, because the action of these arms does not influence the duration of the game.

If it is not desired to make such a deep study of details, a somewhat greater force may be taken. In the grand war game, the best units to study are comprised between a mixed brigade and a separate division. But it is understood that, in this case, no effort is made to study the effects of fire in detail; their determination will be left to the unrestricted action of the umpire, who will reach very just and exact conclusions if he has had previous experience in directing matches where such details have been minutely studied.

Lastly, the war game can be utilized to study the strategic handling of troops. Up to the present time no rules have been given for the strategical game, which enters the domain of the staff studies taught in the institutions for higher military instruction.

There are, then, three kinds of war game—that of the "regiment" or "detachment," which has for its object the study of details; then the "grand war game," which enlarges the field of operations and which it is useful to alternate with the first; and lastly, the "strategic game," which deals with the general conduct of operations.

Such are, in general, the ideas set forth by Meckel. The appearance of his brochure caused a great flurry among all old partisans of the former method. Colonel von Trotha echoed all the recriminations that it excited, and published an article in which he attacked especially the principles of "independent direction" adopted by Meckel. He tried to prove that if the principle were admitted it would create discontent among all the players obliged to accept the personal ideas of the umpire; that this manner of directing a game was admissible only in the exceptional case where the functions were performed by some one having a universally recognized authority, or at least a capacity absolutely transcendant in the domain of tactics. If this condition were not satisfied, the matches would resolve themselves into idle and fruitless discussions, for the actual force of direction rests not in a personality, but upon a set of impartial rules, applicable alike to the players and the umpire.

But the impetus had been given. Meckel, on the other hand, feeling himself supported by the encouragement of high military authorities, published, in 1875, his "Instructions for the

war game," containing in Part I the rules for it. Let us note here that Part II, which was to be the application of these rules to concrete cases, never appeared, on account of the publication of the brochure by Colonel von Verdy du Vernois.

Before commencing the study of the instructions, let us recall that Captain Meckel admits two kinds of war game—the strategic game and the tactical game—in which he makes a distinction between the grand war game and that of the regiment or detachment. It is in the last only, adapted to the study of details, that he recommends the study of the effects of fire and the determination of losses for each organic unit.

In his instruction, Meckel commences with a description of the apparatus, and treats first of all of the *Maps*.

MAPS.—Maps of different scales are required for the different war games. That of the detachment is played preferably on a map drawn to a scale of $\frac{1}{62500}$; the scale of $\frac{1}{80000}$, until then used, appeared to him too small to permit a detailed representation of the progress of a battle.

For the grand war game, the scale of $\frac{1}{125000}$ is the best; as to the strategic game, it will be played on the map drawn to a scale of $\frac{1}{100000}$, the German general staff map.

The maps must present a moderately accidented terrain, sufficiently varied, and offering a certain number of features, such as villages, farms, wooded patches, etc. A map which presents a peculiar character, such as an open plain, a vast extent of dense forest, or a mountainous region, is as little suited to the war game as the country represented is to the movement of troops.

The maps, divided into squares of from 30 to 35 centimeters, will be mounted on linen or cardboard. Meckel recommends the use of a table 1.5 meters long by 1 meter wide, supplied with leaves to increase its size if the map used should be larger than that.

But ordinary maps are not, as a rule, suitable; those employed for the match must be much more detailed.

Thus, the practicability of water courses and of all the obstacles which the terrain presents should be either indicated on the map or explained by reference notes.

The representation of cover, especially villages, ought to be made with the greatest care, even in the smallest details,

so that the drawing itself is sufficient to give an idea of their power of resistance. For villages, special attention is required in the representation of outskirts, and of the character of construction of the buildings and inclosures.

The drawings should indicate very clearly the nature of the forests and of the cuttings made, so that one can determine at a glance their practicability and the strength of resistance which their borders offer. All of the accidents of ground which can be utilized as cover for troops should be represented with particular care: thus, it will be necessary to indicate swells in the ground, small bluffs, the diameter and depth of depressions, ditches, dry ditches, and sunken roads.

PAWNS.—Pawns present no peculiarity. Observe, however, that Meckel allows the use of different pawns for the detachment game and for the other kinds of games; the tables accompanying the instructions explain them in detail.

He recommends, however, for the detachment game, that the numbering of the pawns be specially noted with a view to having a fixed order of battle, which permits the determination at any moment of the use of each body of troops.

He insists on this precaution: Never handle the pawns when not in use, for they will very quickly lose their color; until the very moment of placing them on the map, keep them in a pasteboard box, so divided that each kind of pawns will have a separate compartment.

SCALE OF DISTANCES.—The scale of distances serves to facilitate and regulate the movements of the troops on the map.

The unit of time, that is to say, the duration of the round, is fixed at two and one-half minutes in the detachment game, and at five minutes in the grand game. The speed with which the troops march under normal conditions is based on the regulation gait. A small apparatus, constructed according to these data, and consisting simply of a strip cut out of sheet brass, gives for the three arms and for each gait the distance passed over during a round, so that any change of position of the troops on the march may be represented with rapidity and exactness. The outfit for the game comprises also dividers and paper scales of distances.

ARROWS.—Arrows are an invention of Captain Meckel, and are of the form of a horseshoe nail; they are of two different lengths, indicating whether the distance passed over is at a walk or trot, during a round.

They serve a double purpose: First, to indicate that a troop is on the march, for which purpose the head of the nail is placed against a pawn, and the direction of the march indicated by the point; second, to show the point the troops will reach during the next round, whether it move at a walk or trot; in case the movement is executed at a gallop, two of the large-sized arrows are placed end to end.

DICE.—The umpire may base his decision either entirely upon tactical considerations, or he may resort to the use of dice for that purpose. The first method is certainly the most advantageous, because it does not retard the progress of the game; and the leaders, knowing that the element of chance will never influence decisions (and yet chance would produce a certain degree of interest at times), will never depart from tactical principles.

Directing the game in this manner with freedom is easy when the umpire has, by reason of his rank or recognized ability, such authority that his decisions will be received with respect, and his observations and explanations are awaited and desired by all the players; but such umpires are not found everywhere. It is necessary then to resort to dice, and we may remark by the way, that in general it is easier to accept the brutal decision of chance than one proceeding from reasoning, be it never so just. Besides, in many cases where chances appear equal for both sides, the die will be the only means of relieving an embarrassing situation; its use, too, will introduce to a certain extent the element of chance, the influence of which, we must admit, plays so great a rôle in war.

Meckel recommends the use of six dice, the different faces of which, numbered like ordinary dice, are painted in white, red, and black. The white faces are neuter, and are used only because they allow a variable ratio to be established between the red and the black. These, in conformity with their number, represent the expression of ratios 1 to 1, 1 to 2, 1 to 3, 1 to 4, 1 to 5, and 2 to 3, and serve according to the rules to determine favorable or unfavorable chances. Thus, after examining the tactical situation, if the umpire thinks the chances of a side are only 1 against 2, he will employ die No. III. The faces 1 and 4, red, are favorable; the faces 2, 3, 5, and 6, black, are unfavorable to the side which has only 1 chance against 2.

The die is thrown. If a red face is up, it indicates a favorable result; any other face, an unfavorable one.

The dice serve as well to determine the losses occasioned by fire.

TABLES OF LOSSES.—The effect of fire ought to be the basis of the umpire's decision. It is necessary to be able to estimate it and take it into account during the entire course of the match.

The factors which should enter into its calculations are: The tactical situation and the morale of the troops delivering the fire, the nature of the target against which it is directed, and, finally, the range. By combining these known quantities with the five different values which he uses to estimate the efficacy of the fire (values which are subdivided three times, thus making fifteen combinations), and adding thereto the use of dice, the desired elements are obtained for finding in the tables the figures required to calculate the losses.

There are two of these tables: One gives the results which one-third of a company of infantry (a platoon) can obtain at different ranges by firing during a round (two and one-half minutes); the other gives the same information for the fire of two pieces of artillery under the same conditions.

By adding together the points thus obtained the losses can be estimated, allowing 60 points to represent one-third of a company of infantry or of a squadron, or two pieces of artillery. The losses should be calculated for each organic unit, company, squadron, or battery, as well as for all detachments operating separately.

The umpire could not be charged with this work, without greatly delaying the progress of the match; hence, he has an assistant to make the calculations and keep a record of the losses according to the accepted decision. But it is understood that the calculation of the losses is not absolutely necessary in the detachment game; it is a special study which has the advantage of allowing, in addition, an estimate of the expenditure of ammunition.

PROGRESS OF THE MATCH.—We know already that the umpire has an assistant; but he requires two assistants if the match is not conducted on a single map in the presence of all the players. As to the leaders, they may be alone, or assisted by other officers, to whom they intrust the command of troops as subordinates. No more than ten officers are required on each side.

The match may be played on a single map, which is the usual method in the grand game or that of the detachment; or, else, the sides may act separately, which is the method employed for the strategic game.

THE TACTICAL WAR GAME.—Each side receives the hypothesis and its own theme, enunciated in conformity with all the precepts set forth in the "Études sur le Jeu de la guerre."

With the exception of night attacks, all the varied and numerous circumstances attending war can be studied.

The strength of the force to employ depends entirely upon the object to be accomplished. As a general rule, for the detachment game, it is not necessary to exceed one or two battalions of infantry, with the proper proportion of cavalry and artillery; but if it be desired to study in detail the effects of fire, not more than one battalion should be used; and for the grand game, the maximum limit is fixed at one division.

In making out their orders the leaders should not have the detailed map of the game; they must use the general staff map, the only one they would have in a campaign. The orders are transmitted in writing to the umpire, to establish the initial situation, and, these preliminaries ended, all assemble and the game begins.

It is useful to put at the disposal of the leaders maps to a scale of $\frac{1}{25000}$ or $\frac{1}{50000}$, so they can follow the operations up to the moment when all gather around the detailed map.

When the leaders have their subordinates in good position, the umpire communicates to them any knowledge he deems necessary, gained either by reconnaissance or from any other source. This enables him to exert a powerful influence on the general conduct of the match, and to this alone he should confine himself if he would carefully avoid directly interfering with the leaders and influencing the plans which they adopt.

The sides should receive only the number of pawns corresponding to their numerical strength; a good plan is to not give them, at the outset, the pawns representing the bodies of troops deployed as skirmishers, but to wait until the moment of deployment, and then exchange the ordinary pawns for them. This avoids having on the map an indefinite lot of pawns bearing no relation to the numbers employed.

When the march of approach is completed, and the leading troops of each side become visible and a battle is imminent, the umpire causes to be placed on the detailed map all the troops visible to both sides, and these only.

The preparatory work is ended and the map maneuvering begins.

The umpire announces the first round, his assistant notes the time, and the match develops round by round.

The sequence of operations during a round is as follows: Placing of the pawns representing the new disposition of the troops, determination of the effects of fire, decisions based upon the effects; then orders are given, all the information obtained by reconnaissance is furnished and the leaders acquaint the umpire with the movements of troops which do not appear on the map.

It is thoroughly understood that all communications should be given to the umpire by each leader in such a manner that his adversary can not hear them.

In critical or decisive moments, the duration of the round, two and one-half minutes, may be subdivided into periods as short as desired to facilitate the study of a detail.

The orders of a leader to his subordinates should always pass through the umpire, who delivers them to the person addressed when the time necessary for their transmission has elapsed. The same rule is observed in regard to information. It is absolutely necessary that the movements of troops not visible on the detailed map be closely watched, in order to avoid improbabilities; the umpire's assistant may be charged with representing them on a special map. All decisions of the umpire are executory, and should be accepted without discussion, which is authorized only after the termination of the match. But a player is always allowed, when a decision is rendered, to call attention to advantages which may have escaped the umpire, or which he believes had not been sufficiently considered.

The greater part of the umpire's decisions will bear upon the following points:

(*a*) On the power of resistance of troops on the march and in fatigues, on the duration and rapidity of movements during an action, and on the cohesiveness which troops maintain in critical or difficult situations;

(*b*) On the value and practicability of the cover presented by the terrain;

(*c*) On the operations of the service of reconnaissance, and the information which it is able to transmit;

(*d*) On the results of a secondary conflict, the influence it may exert on the duration and issue of the general engagement, and upon the consequent situation as it affects the two sides.

It is not possible to give rules to govern the umpire in all the numerous and different cases which can arise; his tactical knowledge will be his only guide. As soon as he sees that the action is sufficiently advanced to be instructive, and the objects sought by the two adversaries are clearly indicated, he may stop the match. The game ought to be managed so as not to last more than two or two and a half hours, in order to allow sufficient time for discussion, which should be conducted in the manner prescribed by the "Études sur le Jeu de la guerre."

THE GRAND GAME.—The rules of play are the same, but owing to the larger force employed, the battle can not be studied so much in detail.

THE STRATEGICAL GAME.—The strategical game deals with the functions and knowledge of the general staff officer. It enables him to study the preparation of orders for marches, cantonments, and bivouacs, for battle, outpost, and reconnaissance duty, etc. Besides, it can be advantageously employed to study all the "services," intendance, medical department, and telegraphs, especially as applied to service in rear of the army and on the line of communications. It is equally useful, too, for studying concentration of troops and their strategical deployment.

It is naturally out of the question, during the progress of a match in this form of the game, to assemble around one and the same map all the officers that are taking part in the operations. The parties work separately, reducing everything to writing, in three rooms, one being reserved for the umpire. This official controls the progress of the match by giving such information as may cause the operations to develop in a normal fashion.

Battles are not generally studied in detail; it is sufficient to indicate only their general features, and the umpire's decisions are rendered only to determine their influence on subsequent operations.

Rules, or even directions, are out of the question; besides, the strategic game is on the whole the same as a staff journey, only executed under different conditions.

Meckel concludes by laying stress upon the difficulties attending the functions of the umpire, not only from the tactical knowledge required, but also on account of the observations

he is called upon to make in the course of discussion. He will have to show a great deal of tact and carefully avoid wounding the sensibilities of anyone, or else hard feelings will be engendered, the immediate result of which would be to render his functions very difficult, if not impossible.

Such is, in outline, the system approved by Captain Meckel for playing the war game. He had realized that so long as it was played even according to the improved method devised by Reisswitz it could not readily become a tactical exercise. It could not be such where the application of all the rules which restrained the leader and umpire played such an important part, and where the mechanical part of the game, so to speak, was of more importance than the tactical part, which latter should be the only consideration and sole object of those who participate in it.

In his studies on the war game Meckel had advocated the independence of the umpire, based solely on tactical considerations. In his instructions he dare no longer be so pronounced; while recognizing freedom in umpiring as the only true method, he allows it only when the rank or personality of the umpire endow him with such superiority that everybody is forced to accept his decision without discussion. In every other case, and apparently to introduce the element of chance to a certain extent, he advises the use of dice as a basis of all decisions.

The effects of fire play such an important rôle in the game that they can not be neglected, but as he proposes quite complicated rules for calculating the losses, which the umpire must study, there is entailed for him a greater or less loss of time in the course of the match. It is but just to observe, however, that he advises the employment of them only for a very small force.

He has seen fit to preserve the old method of dividing the game into rounds of a fixed duration. His instruction was to be followed by a second part, giving the application of his rules in concrete cases; but, as we have already said, he abandoned it after the publication, in 1876, of the brochure by Colonel von Verdy du Vernois—"Études Complémentaires sur le Jeu de la guerre."*

*An effort to simplify the war game, by Verdy du Vernois; translated by Morhange, 1877. Brussels, Muquardt; Paris, Dumaine.

PROCEDURE RECOMMENDED BY COLONEL VON VERDY DU VERNOIS.

No more rules, not even directions; the umpiring absolutely untrammeled, resting only on tactical considerations; the battle studied by rounds, the duration of which to depend solely upon the actual duration of interesting stages of a battle. Such are the salient features of the new method, as set forth by the author in the exposition of a concrete case, preceded by a very short preface.

He commences by saying that the incontestable usefulness of the war game is to-day generally recognized and appreciated; nevertheless, every day witnesses efforts abandoned when they are scarcely begun. The question arises, Why is the war game not more generally practiced? The most frequent reply is, "We have no one who knows how to direct it suitably."

Evidently the management of the game requires a knowledge of the tactics of the different arms, as well as of their power of resistance; but the preliminary instruction of officers will have given them a foundation for this knowledge; practicing the war game will develop and strengthen it. In maneuvers every field officer, above and including the grade of major, may find himself in command of a detachment composed of the three arms. It is therefore indispensable that these officers prepare themselves in advance for such emergencies by applying themselves to the solution of the problems which the war game affords them.

Let us admit, for an instant, that the military instruction of young officers sometimes presents certain blanks, and that the decisions of the umpire, even, are not always beyond criticism; but do not such things happen in every military operation? We know they frequently occur in the field with well-trained troops. It is not, then, in the preceding reasons that we must seek the causes of the failure of the war game, but rather in the numberless difficulties which beset beginners in handling the tables of decisions, tables of losses, etc.

The game will be just so much the more useful as it is stripped of all this absolutely needless balderdash. The war game must be directed like a staff journey, in which the umpire renders his decision, based solely upon his own ideas.

Colonel von Verdy du Vernois does not pretend that the method he recommends is the only good one.

He admits that according to the object sought one may employ either the strategical game or the old game as taught until now, with all its rules, dice, and tables, or the simplified game, using only maps and pawns without any other paraphernalia.

Every meeting of officers will choose the method which suits it best. Moreover, whichever one be adopted, its value will always depend upon the aptitude and military ability of the umpire.

Then, after this preface, follows an example of a detachment game, in which the author shows the application of his method to a concrete case. This example can not be outlined; it would have to be recited in full. But we are going to indicate the general course of the game, and the method of execution employed by Colonel von Verdy du Vernois.

Note at once that the course of the match follows, in a general way, the ideas expressed by Meckel, with the exception of the division of the game into rounds of a fixed duration and the employment of dice and tables of losses.

MANAGEMENT OF THE WAR GAME BY THE METHOD OF VERDY DU VERNOIS.

The execution of a war game requires—

First.—A detailed map, drawn to a scale of not less than $\frac{1}{8000}$.

Second.—A general map on a more reduced scale, say $\frac{1}{20000}$.

Third.—Some pawns made to the same scale as the detailed map; scales of distances, and dividers.

Before commencing the operation, the depth of the columns and rate of march for all the arms must be definitely fixed. For the latter, the distances should be stated in round numbers per minute. It is thoroughly understood that the umpire may change the conditions by declaring the troops more or less shaken, the roads bad, or by imagining any other cause calculated to influence the progress of the troops.

FORMULATING THE HYPOTHESIS.

The umpire prepares the hypothesis, and communicates it to the leaders a few days in advance or even on the day of the match. The former is preferable, because in reality the officer who, in time of war, is charged with any mission whatever, has more or less information concerning the situation.

If the enunciation is not communicated until the last moment, there will invariably result a loss of time, during which the subordinates and spectators remain unoccupied.

It is better to communicate to the leaders the general hypothesis, as well as their own themes, in advance, for this will enable them to prepare the orders which the umpire must have to establish the initial situation of the match.

The hypothesis gives an outline of the general situation, setting forth what in reality each leader could know in reference to his adversary. The individual themes recite the exact composition of the forces, indicate the special mission of each leader and the officers who are to assist him. The umpire states also the exact day and hour the leaders are to transmit their orders to him, and if upon their receipt he is in need of additional information, he asks it of the leaders under the form of a memorandum. Rapidly executed sketches may also be useful to represent either an order of march or a network of outposts. The sketches when attached to a memorandum make it clearer and more easily understood.

The initial situation of the match can now be established by the umpire. He ought, whenever possible (but this is not absolutely necessary), to have an assistant to keep the notebooks (one for each side), measure distances on the map, make the necessary calculations relative to the marches, and, in a word, to have charge of the material and the mathematical part of the game.

Thus, as soon as the orders of the two leaders have been received and their purport determined by the umpire, the assistant writes on two separate sheets of paper the memoranda for the two sides, entering first what is required by the orders.

These tables of memoranda should contain the hours of departure; the formation and order of march of the different columns, so far as they are known; the names of places where these different columns begin the movement, and the names of officers who command the detachments.

OPENING OF THE MATCH.—After these preliminaries, which each one has arranged at home, all the participants assemble on the day appointed.

The place where the match is conducted should be arranged with two communicating rooms, so that each leader may be able to give his orders and instructions to his subordinates

without being heard or inconvenienced by the opposing side. In one of the rooms the assistant to the umpire places the detailed maps, and in the other the general map. The umpire assembles all the officers and goes over the hypothesis; after which one of the two sides withdraws to the other room. The leaders communicate to their respective subordinates their own themes and the orders they have given, adding such instruction as they think necessary. Each commander then receives a number of pawns corresponding to the force and composition of his command; it is advisable, also, to give the commanders the different pawns representing the various formations their commands may take up; as, for example, to a battalion commander, pawns each representing a company, eight or ten pawns representing sections deployed as skirmishers, and others representing smaller fractions. This method is preferable to exchanging the pawns every time there is a change in formations, for it avoids a useless waste of time. The umpire must then allow a little time to both sides, so that officers who are not familiar with the hypothesis and their own themes and special missions, may study them and get their bearings on the map.

If there be not several of the maps showing the general scheme, the umpire should allow both sides to orient themselves on the detailed map.

If necessary, the umpire can at the same time be gathering any lacking information needed to establish the initial situation with exactness. The latter clearly fixed, the umpire will examine, without either side being allowed to see him (one of them being in a separate room and the other removed to a distance from the map), when and at what point the two sides will become visible to each other; this will be determined from the hours of departure and the distances covered by the troops, as indicated in the orders issued by the leaders. If, for example, the two sides can not become visible to each other before half past 6 o'clock, he will fix that time as the beginning of the operations. In the course of the match, he will determine in the same manner, using as a basis only the salient features of the operations or battle, the time which will correspond to any situation sufficiently interesting to warrant special study; the study of the battle will then be divided into phases, the duration of which depends solely upon the progress of the action.

It is observed that Verdy du Vernois has abandoned the system of rounds of equal duration, and substituted therefor periods varying in duration according to the length of time necessary to reach an interesting point or a situation which merits especial notice. The duration of preliminary movements, or unimportant marches of approach, are taken into account only to calculate the time necessary for their execution.

EXECUTION OF THE GAME ON DETAILED MAPS.—One of the two sides (red, for example) occupying the separate room, the umpire calls the other (blue) near him.

All the officers comprising the "blues" may be called near the map at the same time, but the umpire should make it his business to see that none of them, except the one he addresses, gives his opinion or indicates any disposition to be made or orders to be given. He sees to it, also, that orders and reports are not delivered to the persons addressed until the very moment they would receive them in reality; that is to say, he must take into account the time necessary for their transmission.

He then reveals the initial situation at 6.30 o'clock, for example, to the "blues," and has placed upon the detailed map the pawns representing their forces, which, from what he has seen of the movements executed by the other party, will be seen by the "reds."

He directs the attention of the "blues" to what they themselves may see of the enemy, and directs the leader or leaders to think over what they will have to do. Then the "blues" quit the room and the "reds" enter, when the umpire goes over the work in the same manner for them; the red and blue pawns, representing the first troops in each other's presence, are now in position on the map.

The umpire then questions the two sides separately as to their intentions. He begins with the "reds," who are now with him, and he sees, for example, that it will be 6.34 o'clock when the measures which they wish to adopt will have been executed.

He then goes to the room where the "blues" are waiting, and asks what they would be doing during the same four minutes. Then he reunites the two sides around the map, shows the situation again, places in position such visible troops as will have changed position, or concealed troops that will have

become visible, and gives such information as he deems proper. Then one of the sides withdraws; the umpire again questions the leaders separately, and sees, from their intentions, where and at what time the forces will meet (the side which remains in the same room with him withdrawing from the map, as before stated); he calculates the time required for the orders and information to reach the parties addressed, and then calls both sides around the map. He takes up the situation where he had left it, causes each subordinate commander to move his own pawns in conformity to the orders which they have previously communicated to him, and the exercise continues in the same manner until a solution is reached or the umpire sees fit to terminate the match.

All the decisions relative to the success or failure of an attack, to the possibility of continuing a march in advance or to the necessity of retreating, are based solely upon tactical considerations, the umpire viewing the effect of fire only from its possible effect upon the morale of the troops engaged. There are neither dice, tables of losses, nor lists of losses to be made out; the only records the assistant to the umpire keeps consist of notes of the time when important events occur, and of a concise summary of them.

We have been unable, as before stated, to give more than the general principles which regulate the course of the game; the method recommended by Verdy du Vernois not admitting of fixed rules, it is possible to analyze only the mechanical part. For those who wish to study the manner in which Verdy du Vernois applies his method in a concrete case, we direct particular attention to the closing paragraph of his work, in which he says:

"It will be noticed that the management of a war-game match is a great deal more simple and less complicated than appears at first sight on reading the example we present. The calculations of time, as set forth, become greatly simplified when the match is played with the map in sight. * * * Moreover, a large part of the observations indispensable here are not necessary in the true game; the commanders will no longer tell each time what their future projects are; the things done here to make the game more comprehensible are, for the most part, dispensed with in practice, because those interested, instead of communicating their intentions to the umpire, merely indicate them by moving the pawns on the map or by adding to them when new troops arrive upon the scene."

This last transformation of the war game is the most radical. It is no longer a game, but a maneuver against an opponent, developing itself on the map, and kept by an umpire within the domain of tactical principles. All the difficulties attending the exercise pertain to the manner in which the functions of the umpire are performed, and adversaries of the game, seizing upon that fact, advance the argument that of course with an umpire as distinguished as Colonel von Verdy du Vernois, it can not help being interesting and instructive, but that it is very seldom that such a personality can be found. The objection is specious, for the exercise may be fruitful of results without being so brilliantly managed. The example so ably treated by Colonel von Verdy du Vernois proves that the functions of the umpire may be exercised in absolute independence of rules; no special preparation for them is necessary if one has good tactical knowledge, combined with the necessary aptitude and a taste for the game.

However, we shall take up the consideration of the management later on.

The works which we have just analyzed gave a new impetus everywhere to the study of the war game; we already know that it had acquired a firm footing in the armies of Russia, Switzerland, and Italy. In England, Captain Shaw, in 1877, modified the generally adopted method, by substituting for the map a representation of the terrain in relief to the large scale of $\frac{1}{720}$. The results obtained were so conclusive that the Duke of Cambridge, in an order dated October 23, 1883, officially introduced the war game into the English army.*

But the movement was more pronounced in Austria.

The "Organ der Militär-wissenschaftlichten Vereine" as early as 1876 contained instructions for the war game, which closely resembled the works of Meckel and Verdy du Vernois; and these instructions were, in 1883, rounded out by Colonel von Bilimek-Waissolm, who gave some examples of the method and of the management of the game.

In 1877, there appeared in the same publication a study by Captain Reitz, of the general staff, which treats of suitable themes, and in which he lays particular stress upon the absolute necessity of following a regular progression in the study of the war game, and of not attempting competitive maneuvers

* See "Revue Militaire de l'Étranger," first half year, 1884.

with large forces until after having practiced with small ones, even without the enemy represented. Reisswitz had already pointed out the necessity of this in 1824.

Captain Reitz sought the means best calculated to secure progressive instruction, and expressed at the close of his article an idea at least original:

Why should not the exercise be used as well in studying the tactics of foreign armies? For example, one could study the combat of an Austrian with a Russian, or German, or French division. That would compel officers to become familiar with the organization, composition, armament, and the tactics employed by the units of the different arms. Here, too, it would be necessary to proceed from simple to more complicated problems by commencing, for example, with a combat between an Austrian and an Italian company; then the nationality could be changed, and the problem repeated, using a battalion, a squadron, etc.

In order that the war game may reach a maximum of utility, Reitz advises officers who desire to practice it to form a club and purchase the necessary outfit by a small assessment, and to choose at will an umpire to organize and manage the matches. According to him this method produces the best results.

Finally, in 1877 the *Organ* (first half year) contained an article by Major von Hugo Bilimek, of the general staff, on the war game as applied to the intendance service in the field. Assuming the principle that even during maneuvers officers of the intendance do not have the opportunity to prepare themselves for the rôle they are to play in war, he gives suggestions for exercises on the map, the direction and execution of which will be performed by officers of the general staff and of the intendance. We may cite also, in Germany, a paper on the regimental game by Captain Naumann, in which he gives a new method of playing the detachment game. This brochure contains principles of execution and their application to a concrete case. It proceeds, in its general features, along the lines laid down by Meckel, but gives a new basis for calculating the losses occasioned by infantry and artillery fire. The author remarks that these rules closely approach actual results, for by applying them to a situation analogous to that of the German regiments at the battle of Spicheren, the results obtained agree approximately with the losses of the regiments selected for comparison as given by the great general staff in their work on the war of 1870–71.

Finally, efforts have been made in Germany to organize war-game societies among the officers of the reserve and of the landwehr, under the direction of the commandants of districts, who, in time of peace, have the authority of corps commanders over such officers within the limits of their jurisdiction.

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To recount the different modifications which the war game has undergone, to describe the successive phases of its transformation from the game of chess to competitive maneuvering on the map—such was the object of this paper. We have sought to bring out the central idea which guided Lieutenant von Reisswitz and all his successors in their efforts to find a means of practical instruction which, without the cooperation of troops, would serve to improve the tactical education of officers.

The last form given to the game by Meckel and Verdy du Vernois seems to have solved the problem; and in different foreign armies competitive map maneuvering is either obligatory or so universally practiced that it may be considered part of the regulations.

In Austria the game is obligatory. Officers are required to take part twice a month during the winter season—that is, from the 1st of December to the end of March.

In Italy map maneuvering is made part of the professional examinations for the grade of captain and of field officer.

In Russia the exercise is practiced a great deal; and, finally, in Germany, although it is not required by regulations, there is not a single body of officers which does not have its war-game matches.

Everywhere, it has its enthusiastic supporters and consequently its detractors, but without doubt its worst enemies anywhere are those who are indifferent.

Even in Germany some authors of more or less humorous articles picture it as a hothouse plant, weakly vegetating in the officer's club, and existing only because superior authority insists upon it. Sometimes we are shown young lieutenants amusing themselves with the war-game dice during the progress of a match, instead of occupying their time with learned calculations to determine how much loss a skillfully unmasked battery has inflicted on an adversary; or pushing forward the hands of the clock so the game will sooner terminate. Occasionally, we have pictured a poor captain, who, charged

with giving a very important order, can not prepare it quickly enough; the efforts he puts forth make the room entirely too hot for him; he seeks the refreshment of a few glasses of beer, and, in the end, under the sharp gaze of the umpire, his colonel, completely loses his head and finishes by swallowing his cigar, fire and all. During this time, the army corps and divisions are dancing a mad saraband on the map, the troops are marching 20 miles an hour so as to finish the job as soon as possible, and when the time arrives for a decision there are neither friends nor foes to be found; the action has been so hot, and the fire so murderous that everybody is killed.

The criticisms presented under this humorous form possess some truth. A German proverb says: "There is no one thing that suits everybody," and it should not be forgotten.

The war game has consequently given remarkable results in the voluntary clubs formed in garrison by the officers desiring to engage in this kind of study. Convinced of its importance, they have taken it up ardently, and in it find an energetic stimulant to mental occupation; for we must remember that the object of the exercise is not merely to learn to move pawns on a map with more or less skill, but to apply in a special well-defined case the information already acquired.

To this instruction must be added that which proceeds from the observations of the umpire, and this is the vital point of the exercise. According to the worth of the umpire, so is the value of the match. Verdy du Vernois had already touched lightly upon this point in 1876, and the question is always the same, to judge of it by the following remarks on an article which appeared in the *Militär Wochenblatt* in 1897:

Why do so many officers regard the war game as nothing but a drudgery, instead of according to it the importance which it merits? When they reach such a conclusion, it is because they know neither how to use nor how to manage it. Many officers pretend that these qualities are possessed by only a few privileged persons; of course they are wrong, but they gladly seize upon this as a reason for not paying more attention to it. To perform the functions of an umpire, no exceptional qualifications are necessary; all that is required is to render the exercise attractive and interesting. For that, one only need observe a few simple maxims: The most dangerous enemy to the war game is slowness; if the commencement of the match drags painfully, if all the preliminaries are scrutinized

minutely down to the smallest details, if the cavalry screen is examined even to the very marching of the smallest patrols, hours pass before the match really begins, and the interest is already much diminished. It is necessary to examine in detail only the salient points, and generally these are not numerous. No single match ought to last more than three hours at most.

Every match should have a well-defined object, that is to say, have for its aim the demonstration of a special tactical problem. It is evident that at the outset it is best to begin with small, easy operations; but when, thanks to well-regulated progress, officers shall have acquired some experience, when the tactical lessons will have borne fruit, care must be exercised to avoid enunciating themes which always have the same general character, and to vary them so as to develop the spirit of decision in those who take part in the exercise.

The hypothesis and all orders must be prepared with the utmost care; and it is of the greatest importance that the initial situation be established as clearly and plainly as possible, for upon this the whole match depends.

The umpire should require the leaders to express their intentions in the form of orders, as this obviates indecision and loss of time. These orders will be only rarely given in the form prescribed by the umpire; and this limitation will operate to introduce the essential principles of noninterference in the development of the match. Certainly, the umpire should see to it that matters do not take a grotesque turn, though he ought carefully to avoid influencing the leaders or their subordinates for the purpose of developing a match according to his own ideas; because to do so would remove all freedom of action from the players, and quickly make them completely indifferent to the results of measures thus imposed upon them. Frequently, it is the adoption of unforeseen or even defective dispositions which give rise to the most interesting and instructive situations in the match.

Whatever may be the measures adopted, the umpire should permit them to be pursued to a conclusion, as the consequent results will be a better lesson than any criticism he would be able to make beforehand.

Besides, if the umpire is obliged to interfere, it is easy for him to do so through the medium of the directions he gives to each side. By so doing he imposes no restraint upon the player's freedom of action, and is able, nevertheless, to assure

contact of the forces, without permitting any absolutely inadmissible conditions to arise; but he should never do anything which could be construed as an act of approval or disapproval. The leaders must have full responsibility, if interest in the game is to be maintained.

We speak of information: the umpire must carefully consider the wording of information which he sends, and, instead of making it too definite, always allow the element of uncertainty which exists in war. It will be well, also, before the commencement of the match, to give all the indications as to the season of the year during which the operations are supposed to be carried on, as to atmospheric conditions, the practicability of the roads, forests, water courses, character of buildings, etc.

Finally, in the discussion, the greatest tact should be used carefully to avoid any hard feelings. Comparing orders with results attained, and cause with effect, will serve the best purpose, for by this means criticisms may be made in detail, without engaging in personalities.

To sum up, the war game should be short, animated, proceed rapidly, and not present too great a study of details; if the umpire, moreover, allows the leaders complete freedom of action, it will be interesting and instructive. The difficulties, then, which attend its management are not insurmountable.

Such is the advice given for the umpire by a partisan of the war game.

In conclusion, permit us to ask the following question: Does the exercise offer all the advantages which Meckel claims for it? That would perhaps be asking a great deal of it, but in all cases it may be asserted that it is a most useful exercise, because it develops in the officer a taste for study, appeals to his intelligence rather than to his memory in the study of tactical problems and concrete cases, which are always interesting and instructive, and promotes in him a spirit of decision which in war is the master talent of a commander.