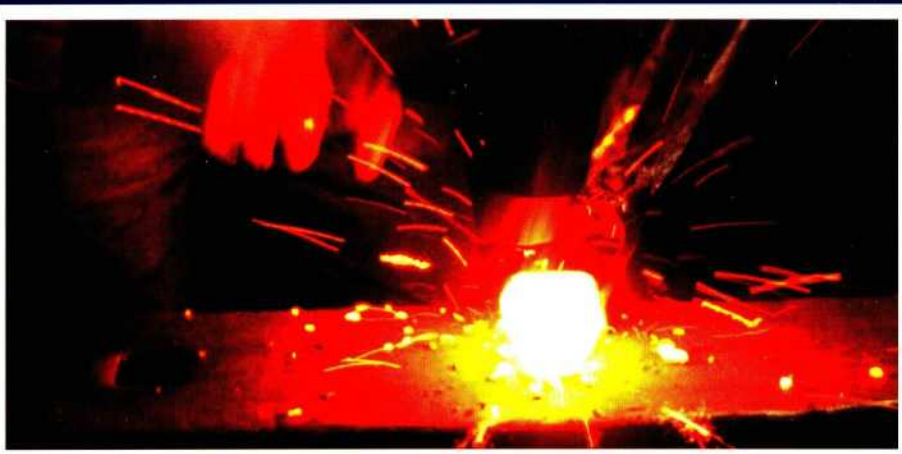
EXPERIMENTELLE ARCHÄOLOGIE

in Europa

BILANZ 2013



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Experimental combat: technical, anthropological and educational contributions

Thierry Luginbühl

Zusammenfassung – Die Nachahmung des Kampfes – technische, anthropologische und pädagogische Kenntnisse. *Die Assoziation Cladio (Universität von Lausanne) befasst sich seit zehn Jahren mit dem Kampf mit nachgebauten gallischen Waffen. Das Ziel dieses Berichtes ist es, die verschiedenen Aspekte mit den technischen, anthropologischen und pädagogischen Werten in den Vordergrund zu stellen. Das Ergebnis der technischen Werte dieser Forschungen – sie werden nur sehr kurz erwähnt – ist hauptsächlich auf die Produktion, die Resistenz und die Ergonomie der gallischen militärischen Ausrüstung ausgerichtet.*
Die „anthropologischen" Werte betreffen verschiedene Fragen, verbinden die technischen Einzelkämpfe (Haltung, Schläge und Abwehr) und die Gruppenkämpfe (Organisation, Angriffe und Abwehr), so wie auch die Abwicklung des Kampfes und die Handlung eines Einsatzes, der zum Erfolg geführt hat (Auskunft, Strategie, Taktik, Befehlskette, Zusammenarbeit, Disziplin...). Die Erfahrungen dieser Spielkämpfe ermöglichen außerdem besser verstehen zu können, was die wirklichen Kämpfer durchmachen mussten. Das verändert eindeutig das Bild, das Informationen aus literarischen Quellen und Ikonografie uns geben. Auf diese Weise kann man pädagogische Werte in den Vordergrund stellen oder sich mit der Kultur befassen. Entweder indem man dem Publikum die Möglichkeit gibt, sich als Soldat zu verkleiden (mit Speer, Schild und Schwert) oder Präsentationen mit Kämpfen zu organisieren. Beide Arten von archäologischen Vorstellungen sind außergewöhnlich beliebt und müssen von wissenschaftlichen Informationen begleitet werden. Auch soll die Ethik am richtigen Platz stehen (Der Krieg ist nie schön.).

Abstract

This article, based on ten years of experimental combat with reproductions of Gaulish weapons by the non-profit organisation Cladio, presents the different thematic categories that this type of approach contributes to technical, anthropological and educational subjects. The technical results are principally about production, resistance and ergonomics of Gaulish military equipment. The results designated as "anthropological" cover a wider scope of questions linked to the techniques of individual and group combat, battle sequences and success factors linked to a victorious engagement. Experimental combat permits a better understanding of the ancient warrior's knowledge through the modern experimenter's "embodiment" of the practices and thus changes current perspectives on literary sources and iconographical documents. The results of the expe-

rimental approach are useful in an educational framework, or for cultural mediation, by offering direct experimentation activities to the public in the form of combat demonstrations. Both types of combat presentations must be accompanied by a morale and ethical explanation about warfare.

Fig. 1: The group Cladio using reconstructions of first and second century BCE weapons. – Die Gruppe Cladio mit Rekonstruktionen von Waffen und Kleidung des 1. und 2. Jahrhunderts v. Chr.

A special type of experimental research

Combat experimentation is a unique branch of experimental archaeology in which the objectives are radically different from the normal goals of reproducing the gestures and the artefacts of the past. While an experimental archaeologist working with pottery will be able to validate a hypotheses through making an identical reproduction of an ancient pot, the impossibility of testing a real battle, which implies death or serious injuries, certainly detracts from the value and the credibility of the experiments, to the point that the scientific community has continually doubted the utility of this type of approach, considering it as marginal or at best, an amusing pastime. Since the late 1990's the participation of university researchers among re-enactment groups practicing ancient or medieval combat signalled a reversal of opinion. While previous experimental archaeology concerning the military was principally concerned with questions linked to the equipment (production, longevity) and daily life, troop manoeuvres and artillery activities were sometimes explored but never included actual non-choreographed combat (Ermine Street Guard starting in the 1970's, Junkelman during the early 1990's). Since the beginning of the 21st century, a majority of re-enactment groups have placed an emphasis on combat experimentation. This type of approach has been developed principally in continental Europe, among re-enactment groups for the "Gaulish period" such as the French groups Ambiani, Leuki, Arverni, Mediomatrici, the Parisian Fiana and the Talapakies from Bobigny, the Czech groups Verduna Boïové or the Swiss troops of Cladio (University of Lausanne, *Fig.1*) and Genva (University of Geneva). These different organisations, who have had numerous battle encounters during the last decade, practice a type of non-choreographed combat using securitized weapons, with the goal of being as close as possible to a real encounter. The "distortion" of the

experience, imposed by rules and safety considerations, constitutes an element that is taken in consideration during the analysis of the experimentation results, as well as the problems of recording and validating the information. Experimental combat distinguishes itself from other experimental subjects by the physical violence it necessitates. In particular, Gaulish weapons are designed for close combat, thus engendering an inherent danger during experimentation that often results in minor injuries. The development of these types of activities within an organisation or club introduces various levels of group dynamics that are not necessary for other types of experimental archaeology. The personal investment of each member is also accompanied by the imposition of a military discipline, absolutely necessary for operating a combat troop, even during training. In spite of these constraints, experimental combat can provide important information about the potential of different weapon types, combat formations and manoeuvres, analysis of combat stances and techniques, but also the specificity of types of equipment in relation to the role of each warrior class.

Cladio: brief history, subjects and experimentation methods

The complete history and development of the group Cladio has been previously presented in the symposium 'Autour des Gaulois en guerre' at the University of Paris XIII, Bobigny, so only a brief summary is presented here (Luginbühl forthcoming). Cladio, meaning "sword" in Gallic, was created in 2001, as a research group by archaeologists of the University of Lausanne and blacksmiths from the Iron Museum in Vallorbe CH, with four principal objectives:

- Developing collaboration between archaeologists, museums and craftsmen for reconstructing Gaulish armaments.
- Testing the material in order to better understand its potential and use.
- Comparing the experimental results with antique author's texts, iconographical sources and modern researcher's findings.
- Developing educational activities and events.

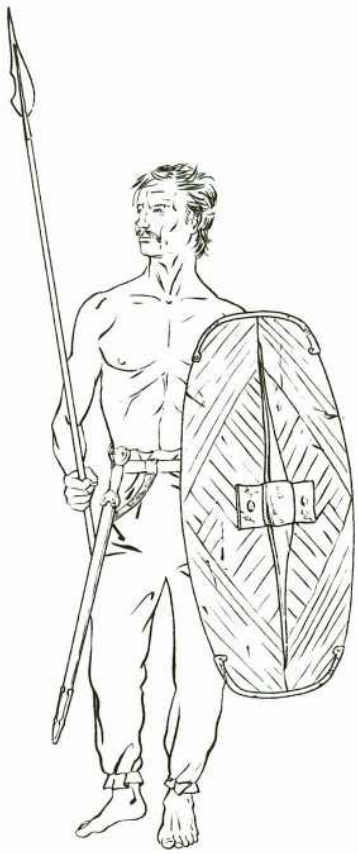

Fig. 2: Reconstitution of the middle La Tène panoply, model of the first replicas produced by Cladio. – Rekonstruktion der Bewaffnung eines keltischen Kriegers der mittleren La Tène-Periode, Modell der ersten von Cladio produzierten Repliken.

Re-organised in 2004 as an "association" (non-profit organisation in accordance with the Swiss Civil Code) and presided over until 2011 by the author, Cladio first

concentrated its activity on the production of replicas of different types of weapons from the second century and first half of the first century BCE (La Tène C2-D2a, see *Fig. 2*). The replicas were made by Xavier L'Hoste and Jean-Marie Corona from the Iron Museum at Vallorbe, as well as by traditional Nepalese craftsmen, working within the framework of an ethno-archaeological research program associated with the University of Lausanne. The replicas provided new information about the manufacturing processes of swords, lances, javelins and shields, plus the initial resistance and ergonomic tests. The increase in members quickly allowed the development of a one-on-one combat training, directed by professional weapons master, Michael Müller-Hewer, as well as group combat formation training (*Fig. 3*). Both types of training were developed simultaneously with improvements on the production of safety weapons (striking parts in latex or covered with a foam sheath) and the training method called "Bilikat" ("beautiful fight"), with precise rules, security measures and a basic Gaulish vocabulary. Conceived for acquiring usable experimental observations on an archaeological and anthropological level, this combat method was conceived to be as flexible as possible in order to correspond to the reality of an encounter in ancient times. The rules are very simple: a fighter hit by the active part of a weapon is offside. He must lie down and wait until the end of the encounter, which is determined by the elimination of all the combatants of one of the troops. The iron helmets protect from all types of blows, bronze helmets protect from projectiles, chain mail coats protect from projectiles and sword strikes. The shield can only be used to strike other shields.

This type of non-choreographed battle presents a real experimental interest despite the imposition of security guidelines and the difficulty of documenting, either by video or written notes (observations, impressions); both being methods that cannot be used for statistical data. The end result of a combat (victory or loss, the number of offside combatants) allows an evaluation of the options taken by both sides, plus an analysis of the factors for success or failure. Research and development about improving these results on the field of action constitute the only method for validating the results, relying on the principle that the tactics that work today are a probable reflection of what worked in the past.

Fig. 3: Formation combat training at the University of Lausanne (2008). – Training des Formationskampfes auf dem Gelände der Universität Lausanne (2008).

Technical contributions

This article concentrates on experimental combat, so research about weapon production methods are not discussed here. Further information about ancient weapon manufacture can be found in the excellent work of Frank Mathieu (Mathieu 2012). The study of weapon ergonomics and traceology were researched through the results obtained from the replicas of ancient arms used in experimental combat. The weapons are made identical to those used in the past. The research about performance introduced new

questions about the different types of equipment: distance and precision of throwing weapons, the ergonomics of hand held weapons and pole weapons, the ergonomics and potential of defensive weapons, employed both in defensive and offensive situations, plus resistance, solidity, longevity. The research undertaken by Cladio and other groups like the Leuki (F. Mathieu) and the Talapakies from Bobigny (Y. Le Bechenec) have shown the capacity of different types of Gaulish lances; which the wide blades are suited hacking blows while the fine, narrow blades are ideal for piercing chain mail vests. The handling and destruction tests performed by Cladio with the replicas of Gaulish swords revealed that its light-weight and blade length of about 70 cm, permits fast, precise blows at a certain distance. These tests also demonstrated the fragility of the blades during certain movements, an indication of their precise use. A La Tène sword cannot be used against a wooden shield since the blade sticks in the wood, implying dramatic consequences for the user, nor against a shield with metal rims or parts since the blade's edge is destroyed on impact. Edge on edge sword parrying is also out of the question since the impact point of both blades causes them to catch and stick together. By elimination, these swords can only be used to strike unprotected parts of the adversary's body, requiring rapid, precise attacks that take advantage of the slightest opening in the opponent's defence system. It is also equally useful for striking a downed opponent.

The studies undertaken on the employ of the large Gaulish shield by several reenactment groups showed both defensive and offensive functions (Gilles 2007; Mathieu 2007; Müller-Hewer 2011) and corroborate the classical and insular literary sources that it was the most crucial element in Celtic combat practices during the late Iron Age. Formerly considered as not very ergonomic by military researchers, the horizontal position of the handle allows the shield to be carried at arm's length with little effort, to be held it in front of the body for protection against projectiles, to be blocked against the body for withstanding a charge, but also to be employed as "ram" and to be used as an offensive weapon by striking with the edges. The Gaulish shield was known by the Romans, who abandoned the Greek hoplon in favour of the scutum, a form of shield derived from those used by their Gaulish adversaries. The many defensive and offensive qualities of the shield in combat are the basis for its great utility in Gaulish type warfare, both for individual and formation battles.

The experimental research undertaken between 2000 and 2011 allowed testing of other types of equipment such as the La Tène iron helmet, which was the prototype for the imperial legionary's helmet. This piece of equipment considerably changed the role of front line combatants, permitting superior resistance during a charge and as a battering weapon for piercing the opposing force's front lines. Documentation of damage and destruction of numerous pieces of equipment during experimental combat constitutes a source of comparative reference material for types of damage (scratches, cuts, rips, folds, deformations) that is certainly useful for analysis of traces observed on Gaulish weapons (see article G. Reich).

Anthropological contributions

Experimental combat with replicas of ancient weapons allows an exploration of the wider questions in the anthropological sphere such as battle sequences, combat techniques, equipment modification, success factors as well as the physical (embodiment) and psychological (agency) implications.

Individual combat

Since the late 1990's, experiments about individual or 'one on one' combats performed with Gaulish equipment have identified the different phases of a duel, which begins, like in the Irish myths (or the Homeric Iliad), by an observation phase, testing and intimidation (see LUGINBÜHL 2012b, 40-41). In a duel with a lance, a sword and a shield, fighters generally choose to hold their lance in a throwing position, the left leg and the shield forward, and usually move in a circular pattern for the footwork, interrupted by quick movements, either in front or behind, in the attempt to find a target on the opponent's side. If the lances fail, the swords are pulled out and circling continues until one of the fighters attempts a strike, a charge or a feint, which most often leads to a quick resolution of the encounter (the decisive strike is often in the first exchange). The research performed by Cladio on the offensive and defensive postures, strike types, sequence possibilities, dodging and counter attacks, have been presented by the weapons master Michael Müller-Hewer (MÜLLER-HEWER 2011; see *Fig. 4*). In addition to the interest and utility for the history of individual combat (LUGINBÜHL 2012b), this research also contributes to the analysis of iconographic representations of Celtic warriors.

Fig. 4: Duel between Czech Boii (Mont Vully 2007) and offensive stances. – Zweikampf zwischen tschechischen Boii am Mont Vully (2007) und Angriffshaltung.

Combat in formation

Cladio has participated in more than 200 battles using combat formations against around fifteen other Swiss, French, Italian and Czech troops during the last decade. The organisation's primary results were obtained through this experimental activity; the findings are still being examined in a continuing research program. This includes observations about the sequences of an encounter, the combat formations, the movements, the chain of command, the necessary levels of discipline, the factors of success and the impressions of the participants, plus the need for various types of fighters with specialised arms for specific functions. Battles fought in formation begin with

tactical choices based on three criteria: the available troops, the composition of the terrain and the specificities of the opponent (number of effectives, equipment, previous behaviour). The implementation of the selected tactical manoeuvre, be it blocking, bypassing, enveloping, breaking through or simply pestering the opponent, must be transmitted to the fighters and carried out, requiring a high level of coordination and discipline from all units. The specificities of the Gallic equipment favour a fight in compact formations, such as square or column formations, supported by more mobile groups of light infantrymen equipped with javelins.

Combat in formation generally begins by exchanging provocations then by a charge, or simultaneous charges, followed by the clash of the two troops and a mêlée or loose disorganised close combat. The quick reconstruction of the unit's cohesion is the key to success during this phase, in which combat formations in groups of two or three combatants allows avoiding or minimising the risks of a rear attack. Close combats in open terrains are generally rather brief and lead to a rout point from which one side has lost the chance of winning and must choose between flight, surrender or fighting on without hope. In the last case, the dominate troop must 'give no quarter' to the opposing side or run the risk of high casualties that could even lead to a reversal of fortunes.

The one of the principal research subjects for Cladio concerns the implementation, advantages and weaknesses of attack formations. The many basic formations described in antique sources such as line, square and column formations, were used for defining offensive and defensive tactical strategies, of which only four, tested on many occasions, are described below.

The wedge formation, called cuneus (wedge) in Latin and the 'Swan's head' by some Germanic nations, is clearly described by different antique sources, emphasising its potential for an offensive attack. The repeated application of this formation, rechristened mocco or "wild boar" by Cladio (see *Fig. 5*), showed that it is actually ideal for piercing and dividing linear defence systems, but requires perfect cohesion among the unit, which can only be achieved through a high level of training. Obviously the lead combatants must be highly motivated and equipped with helmets and chain mail plus a sword and long shield. Lances are of no use for the front line, though if possible, a left-handed combatant should be placed on the far right side.

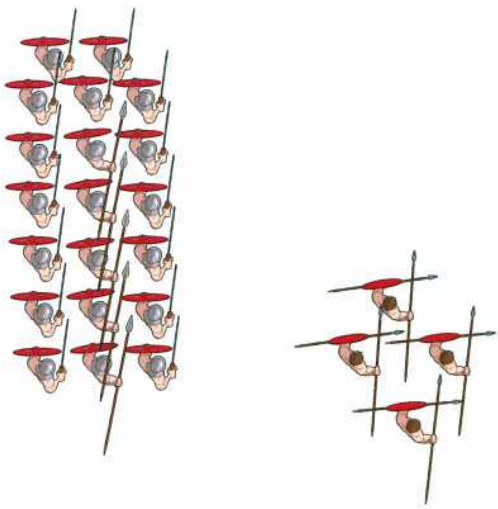

Fig. 5: The assault column (mocco). A formation designed to split a linear defence. – Angriffssäule (mocco). Mit dieser Formation soll eine lineare Verteidigungsstellung des Gegners aufgebrochen werden.

These experiments also showed that a column's right flank (the side unprotected by shields) is particularly vulnerable to attack, particularly for javelin volleys. The light infantry must therefore cover this flank until the clash into the adversary's

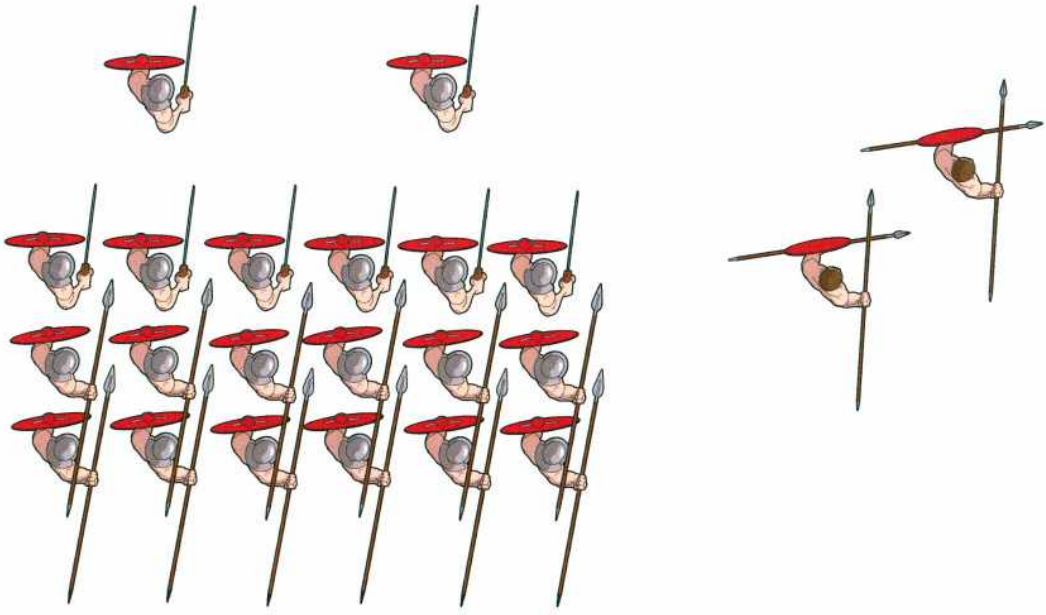

Fig. 6: Assault phalanx with a number of individual front runners (tarvos), whose objective is to strike the adversary's defence a few moments before the remaining troops enter the line. – Angriffs-Phalanx-Formation mit einigen vorgezogenen Frontläufern (tarvos), deren Ziel es ist, die gegnerische Verteidigung zu schwächen, bevor die Hauptmacht folgt.

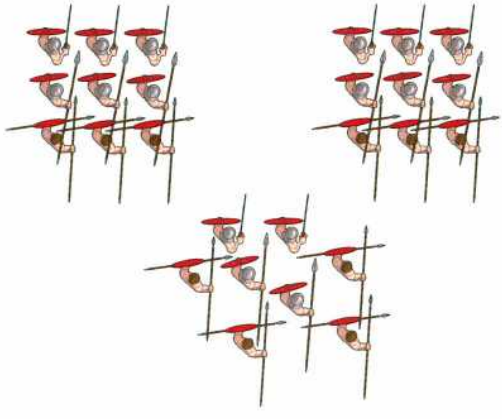

Fig. 7: Inverted wedge offensive formation with advanced flanks (elcos) isolating the adversary's centre. – Umgekehrte offensive Keil-Formation mit vorgezogenen Flanken (elos), die das gegnerische Zentrum isoliert.

shield line. The former will thus be strategically placed to exploit the chaos generated by the progression of the column into the latter's defensive system.

Designated by the name tarvos or 'bull' (*Fig. 6*), this phalanx type of assault formation with individual front runners was implemented many times and equally showed its potential for breaking the adversary's line. The front runners in this formation strike the adversary's defence a few moments before the rest of the troops and attempt to advance while eliminating the most possible number of opponents. This initial strike must be at full force in order to considerably weaken the adversary's defensive formation, which will not be able to respond until actual impact. The paralysis of the objective's defensive system provides a good "survival" chance for the front runner if the following units quickly support them before being enveloped.

The inverted wedge formation has been tested many times with success (elcos, "elk"; *Fig. 7*) and was shown to be

particularly effective within the framework of simultaneous charges by isolating and reducing the adversary's centre. The light infantrymen at the rear of the wings fall back, attacking the centre of the adversary's flanks and rear. This formation necessitates perfect coordination between the units and carries the risk of loosing their own centre units to the adversary.

Cladio has almost always employed a defensive compact formation with at least three rows of fighters, each one leaning on the other with their shields (craega, "rock"; *Fig. 8*). Placed at the back of the formation, the light infantry can guarantee two or even three volleys on the adversary and are in an excellent position for attacking the opponent's flanks after the main charge. This particularly compact formation is very difficult to break when under pressure and allows a powerful forward march after the initial charge.

Tactical deployments using different types of formations and complex manoeuvres were tested during the large-scale events like those at Vully in 2007, at Sainte-Croix in 2008, at Lausanne in 2009, at the site La Tène (Neuchâtel) in 2010 and at Geneva Saint-Georges in 2011. These experiments, that often brought together more than 80 fighters, showed the potential of combining groups for tactical manoeuvres. An example would be using two phalanx units plus an assault column and a light infantryman unit. The implementation of these types of tactics requires a military organization, with a chain of command and a communications system that ideally integrates spoken orders, trumpet calls and signs for reinforcing the units' cohesion and agility. The necessity of a defined hierarchical order imposed the restructuration of Cladio's growing troops after the battles at Vully. The 'modern' need for such a structure implies the existence of a similar system for Gaulish armies and other pre-historic troops, without which it is simply impossible to manoeuvre large groups of armed men.

The experiments performed by Cladio and other re-enactment troops show the obvious necessity of having light troops, to develop a flanking manoeuvre that constitutes the simplest solution for obtaining a numerical superiority, without which the battle stagnates and only the individual value of the warriors comes into

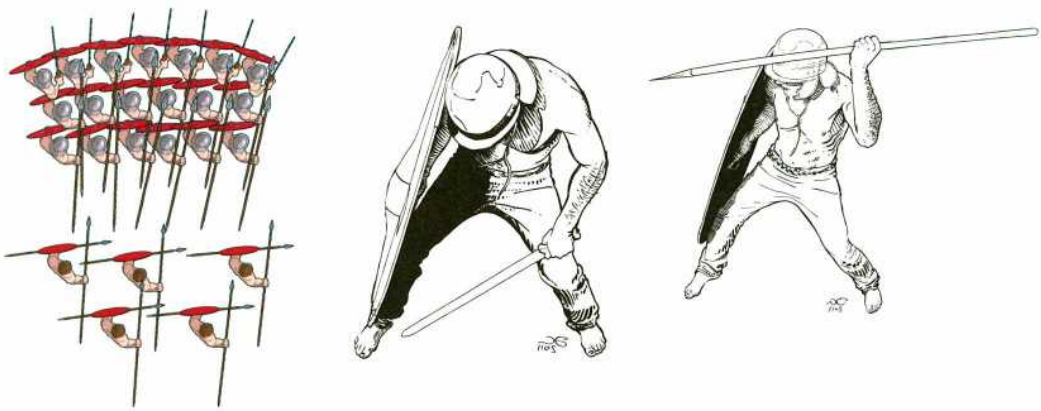

Fig. 8: Compact defensive formation (craega) and combat positions for the front line and second line. – Kompakte Defensiv-Formation (craega) und Schlachtpositionen der ersten und zweiten Linie.

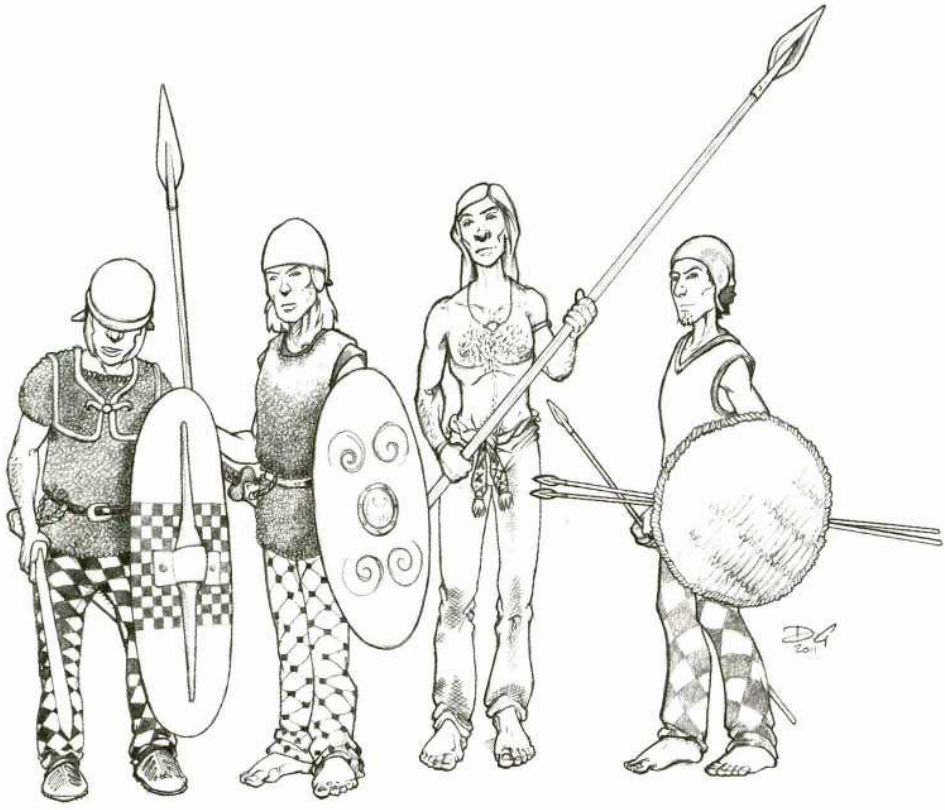

Fig. 9: Types of warriors and their equipment (Cladio). Left to right: front line heavy infantryman, second or third line medium infantryman, lancer without shield and light fighter with javelins and small shield. – Gattungen von Kriegern und deren Ausrüstung (Cladio). Von links nach rechts: Schwerer Infanterist der Front-Linie, mittelschwerer Infanterist der zweiten oder dritten Linie, Lanzenträger ohne Schild und leichter Kämpfer mit Wurfspeer und kleinem Schild.

play. The explicit existence of Gaulish light infantry is not mentioned in antique documents and cannot be deduced from studying iconographical sources, which always have the long shield as an ethnic identification symbol for Gaulish warriors (see LUGINBÜHL 2012a, 138-140). Though unrecognized in conventional historical descriptions of Iron Age military, the Gaulish light infantry were nevertheless present and from the viewpoint of experimental observations, were necessary. The range and type of weapons found in La Tène period tombs appear to corroborate this diversity and challenge the stereotypical image of the late Iron Age warrior.

Practicing fighting techniques and the desire to optimize results while adapting the equipment to specific roles led Cladio to the definition of four types of warriors, based on function, armaments as well as body type and temperament (*Fig. 9*). The special equipment for each these four types of warriors can be found among grave goods and further corroboration of the four different roles could be confirmed by future research in the form of an overreaching re-examination and classification of the La Tène period tombs containing arms.

Experimental combats conducted by the different "Gaulish troops" during the last

decade have also permitted the examination of factors contributing to the success or defeat during combat in formation (acuity and effectiveness of the chain of command, motivation, cohesion, discipline and level of training etc.). The experience of fighting with this type of equipment also modifies the conventional perspectives on literary sources describing the Gaulish ars bellandi, while sometimes corroborating sources considered as topoi. The texts describing the Celts charging "like bulls", for example, no longer appears as a cliché illustrating barbarian fury but as the most effective strategy when using the La Tène type armament. This new viewpoint is equally valid for describing figures of Gaulish warriors, particularly their postures. A complete catalogue of Gaulish images was prepared by a researcher / member of Cladio within the framework of a master's degree at the University of Lausanne (David 2008; see also Luginbühl 2012a, 140-143). Although the experience of fighting with securitized weapons and controlled risk must not be confused with true combat, even so the former allows a better understanding of the latter while offering the possibility to experience certain physical and psychological implications. Those who participated in the "battles" at Vully, La Tène or Geneva did not live the same experience as the ancient Gaulish fighters, but through the simulation of the activity, gained some understanding of the reality of ancient combat.

Fig. 10: Example of organised events: information booth with replicas, combat demonstrations and children's activities (Vully 2007). – Bei Events geschieht die Vermittlung sowohl durch Repliken, als auch durch Kampfvorführungen und Aktivitäten für und mit Kindern (Mont Vully 2007).

Educational contributions

Among public events organised around archaeological themes, weapons and staged combats easily capture the visitor's attention. During the past ten years Cladio has tested different types of activities; displays of replicas, information stands, demonstrations of duels and formation type combat, workshops for throwing javelins or handling a sword and shield. These activities had considerable success with the visitors and often were the main attractions for the events (see *Fig. 10*). These public events allowed organising and financing of the expe-

rimental combat demonstrations within a structure that included both experimentation and communication. The combination of experimental combat and public spectacle contributes the purposes of both, but also implies problems linked to the security of the spectators and sufficient explanation of what happens during the rapid and seemingly incoherent battle sequences.

Without entering into the various motivations for an interest in warfare, the subject can serve as an opportunity for presenting information about society and crafts in the Celtic world. The particular character of the domain of warfare necessarily imposes an accompanying presentation for the public in which the subject is discussed in a neutral manner, neither judging nor valorising, but explaining its place in the context of an ancient culture. The direct consequences of ancient warfare were wounds, infections and death, but it also had a social and ideological function that was an integral part of the ancient Celtic civilisation.

Conclusions and perspectives

In conclusion, experimental fighting remains an atypical research subject, while posing special difficulties in application and implementation; it can contribute useful concepts for archaeology, and in a wider scope, for military anthropology, particularly for cultures that have only a few written sources. Experimental combat allows the exploration of a wide range of questions; ergonomic actions, equipment potential, engagement sequences, combat postures, formations and movements, types of fighters, success factors, embodied sensations and impressions… But it is not the sole means to an end and must have a primary objective of the re-examination of the archaeological, literary and iconographic documentation. Thanks to the experimental approach, we can know what actions are possible with Gaulish sword, lance or shield. By associating these practical results with other approaches (iconology, traceology, statistics, archaeological analysis of classical and insular sources and ethnographic comparisons) it appears possible to finally understand how these weapons actually were employed by the Gaulish armies.

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