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From the Editor.

This issue of the IQ marks it’s first full year in publication, with some interesting, relevant and important research having been carried out. I would like to take this opportunity of thanking all who have contributed to making the IQ a journal to be proud of.

As it is now coming up to the end of the year, we will soon be publishing the first ever “IMAS Yearbook” which will contain selected works from the IQ as well as some lighter articles from it’s predesessor, the IMAS Newsletter.

The Yearbook will mark yet another important milestone in the institutes development and will be being formatted ready for publication by the time you receive this copy of the IQ. The IMAS yearbook will be available to pre-order on the IMAS website from now so please continue to support the IMAS by getting your orders in and purchasing a copy of this historical work.

As always, your support is greatly appreciated.

Jaimie, Chairperson, Editorial Board
General Information

The IMAS Quarterly, otherwise known as the “IQ”, is the official journal of, and is published by, the Institute of Martial Arts and Sciences. The IQ is an international, peer reviewed journal publishing articles covering education and research in the fields of the martial arts, combat sports and related areas. The IQ will be published quarterly in electronic format.

The Editorial Board is responsible for the monitoring of the journal, including its content and technical management.

Any/all opinions expressed in the published material of this journal are that of its contributors, most of whom are members of this institute with certain non-members also being invited to contribute on occasion.

The Editorial Board will not share any of this material, and will not knowingly publish any material, that might exert any bearing upon any individual or organisation.

Editorial Board

Chairperson/Editor in Chief: Prof. James Lee-Barron

Editors: Prof. Mathew Clempner. Prof Mohi Chowdhury

Extensive pool of assistant editors/referees/reviewers.
Publications policy

The Institute of Martial Arts and Sciences Quarterly (Otherwise known as “IQ”) will appear quarterly in English and in electronic format. The IQ is published using the open access model, and will be available to all interested parties.

Manuscripts submitted for publication in this journal are required to meet the usual high standards expected for a refereed publication. They should avoid any sort of self-promotion, and should not advertise, market or overtly publicise, or criticise, any other person or organisation. In short, the manuscript should limit itself to the subject under investigation and not waste time upon trivialities.

Members and others wishing to contribute to the Journal are encouraged to submit papers/articles on the martial arts, combat sports and related fields:

• **Original articles** - experimental or methodological,
• **Research methodology** - combat sports, martial arts, personal safety, etc.
• **Review papers** - articles discussing/evaluating/analysing related material
• **Perspectives** covers topics regarding the possible future evolution of martial arts and combat sports, and also investigates any new directions and/or developments,
• **Short communications**, News and items of interest related to the work of the IMAS
• **Letters to the Editor** containing relevant short opinions, comments and questions
**Preparation of submissions:**

Instructions for Authors

Manuscripts for consideration should be submitted to the Editor via the following email: admin@instituteormartialartsandsciences.com and should be accompanied by a covering letter.

Manuscripts should be:

- between 2,000 and 6,000 words, excluding references
- double spaced
- must include a title
- an abstract of up to 250 words
- up to ten keywords

along with the main text and any acknowledgements, notes, figures/tables, all in one document. All pages should be numbered and any footnotes to the text should be avoided.

Images/graphics are accepted in most formats including jpg, tiff, png and gif.

For more strictly academic submissions, the protocol of data acquisition, procedures, investigated parameters, methods of measurements and apparatus should be described in sufficient detail to allow other researchers to reproduce the results.
Name and references to the established methods should be given. References and brief description should be provided for methods that have been published but are not well known, whereas new or substantially modified methods should be described in detail.

Any statistical methodology employed should be described and explained in detail to enable verification of the reported results.

Said results should concisely and reasonably summarise the findings. Please restrict any tables and figures to the number needed to explain the argument of the paper and assess its support. Do not duplicate data in graphs and tables. Where relevant, include accurate statistical data and analysis.

Any discussion should deal only with new and/or important aspects of the study. Do not repeat in detail data or other material from the Background or the Results section. Include in the Discussion the implications of the findings and their limitations, including implications for future research. The discussion should confront the results of other investigations especially those quoted in the text.

All conclusions should be linked with the goals of the study. State any new hypotheses when and where warranted. Include recommendations when appropriate. Unqualified statements and conclusions not completely supported by the obtained data should be avoided.
Acknowledgements. List all contributors who do not meet the criteria for authorship, such as assistants and people you might have interviewed for additional advice, guidance or information.

References. References selected for publication should be chosen for their importance, accessibility, and for the further reading opportunities they provide.

Must include Title, author, publisher, year/month of publication and ISBN/ISSN number.

References may not be required, relevant or even available for some lighter articles that are written in order to express an opinion upon the more obscure, abstract or philosophic aspects of the martial arts. In such a case, the author should clearly state that the opinions expressed upon the topic are theirs alone, and include a note regarding why they feel a list of references are not included.

Please ensure equality and diversity is observed at all times in your writing and that it is free from any form of bias.

Review process

Received manuscripts are first examined by the editorial board. It is understood that all authors listed on a manuscript have agreed to its submission (incomplete manuscripts not prepared in the advised style will be rejected without further review)
Manuscripts are then forwarded to a panel of independent experts for scientific evaluation. While authors may suggest possible referees, the IMAS reserves the right of final selection. This preliminary evaluation process usually takes 1-2 weeks. Submitted papers are accepted for publication only after a positive opinion has been received from the independent reviewers.

After the submitted material has been reviewed, a decision will be made as regards the following:

1. accepting the paper for publication
2. requesting certain modifications to the paper be made prior to publication
3. declining the paper for publication

These comments will be communicated to the author in accordance with proper procedures.

Papers may not be submitted to the IQ if they have already been published elsewhere, unless specific permission is sought and granted by the editorial board.

**Conflict of interests.**

Due to the very essence of reviews and editorials being that of selection and interpretation of the literature, the Journal expects that authors of such articles will not have any financial
interest in an organisation, product or company either mentioned or discussed in the submitted material.

Journal policy requires that reviewers, associate editors, editors, and senior editors reveal in a letter to the Chairperson of the Editorial Board any relationships that they have that could be construed as causing a conflict of interest with regard to a manuscript under review.

The IQ is a Journal of Record, and papers may not be removed or altered (except for any editorial changes in format that might be required to accommodate new technologies) once publication is made. The IMAS is committed to making all published material more widely available with copies of the Journal being distributed to relevant organisations, archives and libraries.

**Legislation and Copyright**

By submitting a paper for publication in the IQ, authors give their permission, under the UK Data Protection Act, for their names to be made available in electronic format.

Currently, the copyright of all submitted papers is retained by the authors, who, by submission of the paper, grant the Journal an exclusive, permanent and irrevocable license to publish the information in electronic form and in hard copy for the proposed yearbook.

Papers may not be submitted to the IQ if they have already been published elsewhere, unless specific permission is sought and granted by the editorial board.
Papers may be submitted to printed journals after they have been published in the IQ, providing the following conditions are met:

1. the publishers of the other journal are aware and accept that the paper/article has already appeared in the IQ.

2. the other journal is not available in electronic form.

3. the publishers of the other journal undertake to insert the following statement at the beginning of the paper:

"This paper has previously been published in IQ, the electronic journal of the Institute of Martial Arts and Sciences: www.instituteofmartialartsandsciences.com”

Comments to Papers

Manuscripts published in the IQ Journal may be discussed via the members forum on the IMAS website, and also in the “Letters to the Editor” section of this journal.

Commentators are reminded that this is a scientific journal, dedicated to research, review and analysis, and to limit their remarks to the subject under scrutiny. Any comments containing rude language or inflammatory remarks will not be published in the journal and any such
posts made upon the forum will be removed and may result in disciplinary procedure by the IMAS up to and including suspension of membership and/or possible legal action being initiated.
News

Membership

The IMAS membership is continuing to grow and spread across the world, and is becoming a very positive influence for good in the martial arts, encouraging research, education and qualifications amongst martial artists everywhere. This quarter, we have received memberships from Finland, Argentina and Australia, to name but a few.

PhD research assistance required

Two of our members require assistance with research for their Doctorates. Please see details below:

Dr. Melvyn Willin FIMAS is conducting research into the paranormal aspects of the martial arts. Obviously, the item that immediately springs to mind is probably “Ki” or “Chi” and how this can be channeled and used in different ways, and the “Transfer of mind” that is talked about in some of the more traditional schools and systems, but I am sure there is a lot more to it than this. If you have some experience of the paranormal yourself, know someone else that has or have some useful ideas and opinions which might be of help, then please contact this office in the first instance and we will facilitate contact. There is already one member helping with this project, but the more the merrier, as long as you are sincere and have something to offer.
One of our members in Scandinavia is undertaking research into Brazilian Jiu Jitsu. As you know, this system has grown rapidly in popularity over the past few years, largely due to its devastating effectiveness in cage fighting and mixed martial arts, but also because it has recently formed the backbone of the unarmed combat training in some of the US armed forces. I am already well aware of certain members who possess a lot of relevant qualifications and experience in this and related disciplines, and I will be contacting them directly on this candidates behalf to see if they would be prepared to help but, if you are reading this and would like to get involved, then please contact this office.

Note: Serious academic research projects, and particularly those at an advanced level, are the very lifes-blood of the IMAS. It would be impossible for me to over-emphasize the importance of such projects, so please help by getting involved.

12 Year old assistant martial arts instructor receives prestigious Presidential award!

It is with great pleasure that we announce that John Carlos Landry, a 12-year-old seventh-grader from Independence Middle School, was awarded the Gold Level Presidential Service Award for his work as an assistant martial arts instructor. John Carlos Landry has volunteered his time to teach martial arts with his father, Dr. John M. Landry, for over two years at two separate locations.

For his service, he won a Presidential Service Award which was presented to him on Monday, Aug. 13, during a ceremony at the First United Methodist Church of Jupiter-Tequesta. In 2010, John Carlos started teaching martial arts with his father at the West Palm Beach
Salvation Army. Dr. John M. Landry started a no-cost Martial Arts Program at the Salvation Army for at-risk youth and his son immediately started to help out, acting as an assistant instructor.

John Carlos Landry proudly receives his award from his even prouder father, our very own Prof. John Landry.

John Carlos has been practicing martial arts for nine years now and already has black belts in two separate systems. In 2011, Dr. Landry moved the no-cost martial arts program to the First United Methodist church of Jupiter-Tequesta located on Indiantown Road. John Carlos continues to help teach families and children at the new location.

Maria Garcia-Landry, an English Professor at Palm Beach State College, and John Carlos' mother, also helps with the class and won a silver level Presidential Service Award.
Footnote: I also happen to be aware that Prof. John Landry PhD FIMAS has also been a recipient of certain awards of late, but is far too modest to share this information with us. All here at IMAS wish to say “well done and congratulations” to Prof. Landry and his family who have managed to set so fine an example for us all.

Martial Arts Instructors Award.

This course has continued to grow in popularity and has so far attracted participants from Karate, Jiu Jutsu and Kick Boxing. The present cohort of students are all doing well, and are expected to finish the course and receive their qualifications by the end of the year.

If you are interested in joining the next intake, then please get in touch with this office ASAP. The same goes for the Grad.IMAS: Individuals who feel they can meet the entry criteria of this course are now welcome to apply for the next intake.

So, there you have it: Professional memberships, academic research and accredited education and qualifications. Thats what the IMAS is all about. Enjoy the rest of this issue.


Classical Theory of Kinetic Chain

Key words: kinetic chain, core stability, Xingyiquan, Taijiquan, rotational stretch, reverse punch

Yun Choi Yeung FIFL FIMAS

Abstract:

The concept of kinetic chain has been practiced in rehabilitation, performance enhancement, prevention, and in numerous research studies. The classical writings of Xingyiquan and Taijiquan also have similar ideas within the non-concentric framework (Yeung, 2012). The aim of this article is to structure the classical theory in the light of muscular activities and range of motion of joints, and to establish it as a useful tool for evaluation. The classical theory of kinetic chain emphasizes the movement of the torso and its generation of power to the limbs which enables the co-ordination of all the different joints from ankle to hand. Different versions of the reverse punch are discussed in the light of the classical kinetic chain but there are many more complex movements needing further elaborations. It is possible to demarcate between non-concentric movement and movement combined with concentric contraction of muscles, but evaluation is only limited to non-concentric movement. Therefore the generalisability of the classical theory is open to further validation and improvement.

The concept of kinetic chain comes from linkage analysis in mechanical engineering, as the human body could be represented by a chain of rigid segments connected by a series of joints. Steindler (1955) adapted this concept to the human body and proposed that each limb could act as a portion of a rigid chain within a whole system connected together by joints. He considered that system to be closed when the distal extremity is fixed to a steady support in
which the movement of one joint would produce a movement of the others, and the system open when the distal portion has no movement restriction (Oliveira et al, 2006). Since then the concept of kinetic chain has been practiced in rehabilitation, performance enhancement, prevention, and in numerous research studies. In most studies the trunk or torso is the proximal portion of the kinetic chain for the upper or lower extremity. In recent years fitness professionals have increasingly recommended core stability exercises in sports conditioning programs (Willardson, 2007). The core more specifically is the lumbar-pelvic region of the body that links to the shoulder joints and hip joints, and their distal portions. The classical writings of Chinese Martial Arts also adapted the concept of kinetic chain in terms of continuity of joint actions from ground to the distal potion of the upper extremity within the non-concentric framework (Yeung, 2012). The aim of this article is to structure the classical theory in the light of muscular activities and range of motion of joints, and to establish it as a useful tool for evaluation.

**Introduction**

The origin of the classical writings of Xingyiquan is unknown and writings collected in the appendix of Li and Li (1981) are said to be from old manual scripts and publications before the 1949 Liberation. The writings relevant to kinetic chain are the saying of the three segments, the saying of the seven straights, and the six co-ordinations.

**The three segments**

The three segments of the body are the arm and torso and leg, or branch and midsection and root. Each segment also has three segments.

The three segments of the arm are the hand (wrist), elbow and shoulder.
The three segments of the torso are the head (neck), chest (midsection) and “dantian” (lower abdomen).

The three segments of the leg are foot (ankle), knee and crotch (hip joint).

Their relations are start-up and follow-up and catch-up, the arm segments are the starters, the torso segments are to follow, and the leg segments are to catch-up. The problem of inconsistency is avoided due to the differences in length, curvature and balance. Therefore it is important to have a clear understanding of the three segments.

**The seven straights**

The seven straights are (1) hand presses the elbow and elbow does not resist, (2) elbow presses the hand and the hand does not resist, (3) hand presses fingers and fingers do not resist, (4) waist presses the crotch and crotch does not resist, (5) the crotch presses the knee and the knee does not resist, (6) knee presses the foot and foot does not resist, (7) head presses torso and torso does not resist.

The stability of the cardiovascular system, the harmony of Yin and Yang, the connection of the upper and lower extremities, the unity of external and internal, and these are considered to be the seven straights.

**The six co-ordinations**

The six co-ordinations or harmonies are the three internal co-ordinations and the three external co-ordinations.
The internal co-ordinations are

- mind (Xin) and intention (Yi) co-ordination,
- intention and breathing (Qi) co-ordination
- breathing and strength (Li) co-ordination.

The external co-ordinations are:

- hand and foot co-ordination
- elbow and knee co-ordination
- shoulder and crotch co-ordination.

The writings of Wu Yuxiang (1812-1880) collected in the appendix of Fu (1963) were based on old manual scripts of Taijiquan which also endorsed the concept of the connection of the upper and lower extremities. He suggested that rooted on the foot, issued from the leg, mastered on the waist, formed in the fingers, so from foot to leg then waist all in one spirit. His writings were very scattered with different jargons and he did not elaborate on the classical kinetic chain theory but provided examples such as that spine issues the forces, step follows torso movement, one moves all moves, one stops all stops, every joint links through, seeking straight in curves, conserve and then issue, and there is no breakage. His internal concepts were very different and it is postulated that he interpreted Qi not as simple as breathing but as some forms of energy that circulating the body and also involved the spiritual side of the mind. Therefore, these concepts are not relevant to the discussion of this article.

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There is no formal linkage between Xingyiquan and Taijiquan but it is generally accepted that Xingyiquan has a longer history traced back to the Liang Dynasty (502-557) at the Shaolin Temple, and associated with the renowned military general Yue Fei (1103-1142) of the Song Dynasty (960-1279). On the other hand Chen Wangting (1580-1660) the first generation of Taijiquan practitioner in Chenjiagou was a military general of the Ming Dynasty (1368-1644) and retired after the fall of the Ming Dynasty. It is possible that the classical theory of kinetic chain was quite well established for military training during those periods and known to Chen Wangting.

One of the aims of martial arts is to deliver a strike utilizing a person’s maximum power and momentum. The classical theory of kinetic chain is an explanation of how it is done by practitioners repeatedly and as a useful tool for evaluation. Instead of core stability the classical theory of kinetic chain call for core flexibility by stretching the muscle groups in the torso to generate power to the upper extremity and the lower extremity at the same time. The movement of the lower extremity is passive because it is pressed by the weight of the body and pulled by the pelvis, and pushed the body forward by the generated ground reaction force. Therefore all the joints in the chain can move or stop at the same time, and the sum of the kinetic energies of the joints will generate a force from the ground through to the distal of the upper extremity to make a strike. A straight line of attack from the distal can be formed by the different curvilinear motion of the joints, and elastic energy is conserved or stored with the lengthening of muscles around the joints. When the movements of the joints are in terms of lengthening of muscles and recoil back to the original lengths then there is no breakage because concentric contraction of muscle is not used to act as a braking device to slow down any of these movements. The synchronization of multiple-joint coordination requires proper
instruction and training to coordinate in the timing of inter-segmental joints velocities. Roberts et al. (2012) found that the expert group performed much better than novice group and diffusion tensor imaging (a magnetic resonance imaging technique that enables the measurement of the restricted diffusion of water in tissue in order to produce neural tract images) revealed significant differences between the expert and novice groups in the microstructure of white matter in the superior cerebellar peduncles and primary motor cortex-brain regions. This is beyond the scope of this article but the thought is that movements of non-concentric movements are difficult to master because they are contrary to the habits of concentric contraction of muscles developed since childhood.

Xingyiquan and Taijiquan instructions place a lot of emphases on keeping the neck or head erected, mandible retracted, shoulder depressed and protracted, chest relaxed, back extended, crotch relaxed, and rotations of the arms. These actions described the movements of the nine segments of the body namely the neck, midsection, abdomen, hip, knee, ankle, shoulder, elbow and wrist. The movement of the neck segment is linked to the back and shoulders as the sub-occipital stretch retracted the mandible and pulled muscles of the back, and with further stretches generated by the depression and protraction of the shoulder joints. The extension of the upper back bending forward to compress the relaxed chest and squeezed air out of the lungs, and this action pushed the shoulders further forward. The abdominal and gluteal muscles stretched together to rotate the pelvis or the dantian segment of the body, and the hip joints also rotated one side of the body forward. The relaxation of the crotch allows the weight of the body to activate the quadriceps and hamstrings passively, and the rotation of the hip joints extended the knees and pivoted on the ankle joints resting on the ground. The protraction and depression of the shoulder restricted the upward movement of the arm and the
arm is raised by stretching the adductor muscles, and the outward rotation of the shoulder (upper arm) and inward rotation of the forearm intensified arm muscles in stretching forward. The rotational stretches of the arm actually reduced the range of motion of the elbow joint and enabled greater muscle tension on the arm to deliver a strike, and the wrist can stretch forward or bended depended on the striking technique. In a reverse punch, the kinetic chain is from the ground of the forwarded leg to the fist in the opposite side with the other arm assisting the movement of the forwarded arm and the rear leg to maintain stability. The recoil from the reverse punch can actually be used to perform the lunge punch with the other arm in shadow boxing. This is a good example of moving from one kinetic chain to another with the lunge punch start from ground of the rear leg to the fist in the opposite arm.

The concern of this article is the co-ordination of breathing with the body to produce power rather than the psychological factors of mind and intension, and specific techniques in the co-ordinations of hand, foot, elbow, knee, shoulder and hip. Diaphragmatic breathing is viable in the movements of the classical kinetic chain due to the requirement of compressing the ribcage by lengthening of the upper back and squeezed air out of the lungs. The simultaneous stretching of the neck, upper back and abdominal segments will facilitate the torso to return to the upright position and inhale. Therefore the breathing pattern just follows the movement of the torso without inconsistency even in a series of punches. Breathing with the tongue sticks to the roof of the mouth is a common practice in martial arts, breathing exercises and meditation. There are certain advantages of this practice such as increase the production of saliva, increase the size of the airway with the back of the tongue moved forward, and warms and moistens the air inhale through the mouth. Furthermore, even the torso stretched
intensively should not affect the passage of air in and out of the lungs and the retraction of the mandible keeps the throat relaxed.

The classical theory provides a useful tool for instructors and evaluators to correct and improve practitioners in performing certain techniques. Once the possible range of motion is known then any short coming of that standard will require attention, the generation of power in a correct path is a good test of co-ordination, and instantaneous recoil and transfer of stored elastic energy to a following technique is a good indication of continuity. The demarcation of non-concentric movement is possible in view of the movements of the relevant segments of the body. For example it is very easy to identify whether a person is just waving his or her hand in the crowd or performing the Taijiquan form of “Wave Hands like Clouds” properly. Because they do not look the same in terms of the movements of the relevant segments even they look very relax and as if not using any strength. An example from the other extreme is the reverse punch, as a practitioner can perform a very powerful strike without moving his or her hip on a very static forward stance. The reverse punch in Xingyiquan is the second part of the form “Beng Quan” which symbolized as wood or arrow to strengthen the function of the liver and pancreas. The rotation of the pelvis also pulls the rear leg forward half a step to prepare for a quick shift of weight after the strike to move forward. The example of the reverse punch in Taijiquan can be found in the last section of No. 21 form in Simplified Taijiquan 24 forms “Zhuanshen Banlanchui” (turn the body around, deflect, parry, step forward and do a reverse punch). By tradition, Taijiquan is performed slowly while Xingyiquan is performed quickly with stumping and nasal sound. There are many subtle differences with the pre and post techniques but the same basic structure of the classical kinetic chain is applicable. The classical kinetic chain of nine
segments works well with Xingyiquan because most of its techniques are with the body weight on one leg in the beginning. Some movements are balanced on both legs or transferring the balance between the legs or pushing with both hands, therefore the use of two kinetic chains sharing a common torso segments to coordinate movements can develop a series of human animations as standards for evaluation.

The center of gravity is a concern in any striking movement, and an ideal situation would be moving in a straight line in the same direction of the straight line of attack of the distal. This technique is to maintain stability towards the opponent or the object of attack by turning the pelvis pivot on the knee joints and ankle joints to move forward. The advantage of not pushing with calves and quadriceps concentrically in a partial squatting stance when moving forward or backward or stepping is to maintain stabilities in the mediolateral, anteroposterior and superoinferior dimensions. Xingyiquan uses static postures to assist practitioners to maintain passive partial squats, routines for repetitive training in moving forward and turning, two person sets to simulate fighting, and various power trainings and weaponry. Taijiquan does not use static posture but the slow movement and visual aids also assist practitioners to achieve stability, and the unique development in pushing hands to simulate fighting can train the use of strength in terms of adherent, following, neutralization and retaliation. Taijiquan also has various power trainings and weaponry.

In the motion analysis studies on an expert doing the “Yanshougongchui” (cover with hand and punch with fist) from Chen Taijiquan which is also a version of the reverse punch, No. 17 form of the 42 form Taijiquan of the International Wushu Routines, the center of gravity and hand movements were swaying in all dimensions (Zhang 2010, 2011). The expert was doing
it as a performance art and making use of both eccentric and concentric contractions. From observing athletes of Taijiquan in Wushu routine competitions, it is not difficult to note that they have very powerful calves and quadriceps to perform very low stances and moving slowly with poor co-ordinations in terms of the classical kinetic chain. The classical kinetic chain is also a very useful tool to diagnose and prevent knee injuries of Taijiquan practitioners. For example, the body weight and concentric contraction will reduce the normal range of motion of the knee joint, and moving with the brake on so to speak will cause injuries.

Conclusion

In addition to the current practices of kinetic chain in rehabilitation, performance enhancement, prevention, and research studies, the contribution of the classical theory is the inclusion of torso movements, rotational stretches, passive stretches, eccentric strength, stored elastic energy, and breathing. The mechanical engineering view of the human body could be represented by a chain of rigid segments connected by a series of joints can be further expanded with these concepts. The classical kinetic theory is limited to certain non-concentric martial movements, and the three torso segments are not sufficient to simulate or analyse the head and torso movements. This article discussed the application of the classical kinetic chain to the basic movement of the reverse punch, but there are many more complex movements such as the use of centrifugal force to strike. There are also various movements in adherent, following, neutralization and retaliation. Therefore the generalizability of the classical theory is open to further improvement and validation.

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Karatedo as Budo or Sport: Same Essence and Process

Key words: Karate, Martial Arts, Sport Science, Physical Education.

Prof. Roberto González Haramboure. Ph.D.

Abstract:

This article has been written in order to compare and contrast Karate as both a martial art and a competitive combat sport. It will demonstrate that in essence there is, in fact, no real difference to the preparation processes involved in each of these aspects, and that the methodologies and applications found in each can actually compliment each other, making for a more complete and well rounded Karateka.

Introduction:

One of the most outstanding personalities in Karatedo worldwide is Master Gichin Funakoshi. Among his most important teachings is:

“Karatedo, properly taught, is a balanced system of spiritual discipline, physical education, self defense and competitive sport, as long as the the gin-shi-tai principle (development of mind, body and technique) is fulfilled”

Despite those very wise and exacting words, there are still a great deal of masters around the world who think that Karatedo as a Martial Art, is different to Karatedo as a competitive combat sport. But, actually, when visiting either a traditional dojo or a modern sporting type
of club, there is no difference about the clothing used by practitioners, the grading process or Japanese terminology, etc.

**Comparisons of Karate as a Martial Art and a Competitive Combat Sport.**

In order to compare Karatedo as a Martial Art to Karatedo as a Combat Sport, I conducted a review of the most trustworthy bibliography available in the international market regarding the Karatedo preparation process. This study was particularly involved in the Karatedo preparation conceptions, which define the contents and activities that are concerned with the preparation process itself.

The authors consulted were as follows:

**Conceptions specific for karatedo (as martial art or competitive sport):**


**Conceptions for sports in general (which include karatedo):**

Even when the authors consulted have a different origin regarding sport specialty, geographic place and moment of time, we can see their complete concordance as showed in the following chart in blue the sport criteria and red the traditional criteria.

![Components of Preparation Process](chart)

In that case we can explain some subjects often used to differentiate between karatedo as a martial art or a combat sport that actually, on the contrary, are common to each and so extremely useful in unifying them.

- Development of the character, personality end etiquette (Which belongs to the educative preparation, that is one of the transversal topic on training)
- Culture, history and knowledge related with practice (This belongs to the theoretical preparation, that is the other transversal topic on training)
- Bioenergetics (ki) training (Which belongs to factors besides training and competitions)
• Dangerous techniques and vital points (This belongs to the technical training included in both competitive kata and also the self defense taught in classes as well as competitive kumite).

The examples mentioned above are sufficient enough to explain that Karatedo as both a Martial Art and Competitive Combat Sport are the same. As a matter of fact, the only real difference found between them is that one assists in competitive sport and the other does not. But, this circumstantial decision does not affect either the preparation process nor its benefits. Quite on the contrary in fact: The modern methodologies encountered in sports, if anything, actually organises, measures and improves the more traditional preparation process normally found in the martial arts, and helps in ensuring that the Karateka achieves and attains in all aspects of their martial arts training.

In the this article my intention has been try to try and explain the similarity of karatedo as both a martial art and a competitive combat sport, because I am sure this is an important subject for all instructors. I do not wish to do this in any autocratic or beligerent way but, rather, by convincing the reader through the simple presentation of a scientific point of view.

In this particular case, the information and research presented here is a consequence of 9 long years of study and actually formed a important part of my own Doctoral thesis in sport sciences. Therefore, in a theoretical dimension it is more than supported scientifically besides which, this same work also included a practical dimension in which my Karateka-athletes received a far more complete and comprehensive preparation process, as illustrated in the chart above. Consequently, they not only won all of their national and international
tournaments and assisted and established several records that still remain unbroken, but also
developed in to outstanding human beings, just as should be expected in martial arts and
sports.

I firmly believe that this is all thanks to correct type of preparation process.

Conclusion

Despite the presentation of the facts outlined above, my words certainly do not mean that I
am professing to know everything there is to know, nor that I have the only or complete truth.
For that reason, if any reader has another point of view, I invite him/her to mention one
subject present in martial art that is not present in competitive sport or vice versa. If that
happens, I will be more than glad to recognise that s/he is right and that I am wrong, because
I defend the famous phrase: “It is not shameful to change an idea; shameful is not having any
idea to change”. I, therefore, welcome any feedback or opinions which may be forthcoming.

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The Longbow: Maker, Saviour and Protector of England

Key words: Longbow, Archery, Medieval History, Medieval Warfare, Historical Weapons

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Abstract:

This article will serve to illustrate the huge influence the traditional English Longbow has exerted upon the historical development of the British Isles and certain Kingdoms of mainland Europe, and how such a humble weapon, made from basic materials and wielded by common men, changed England from being a weak and vulnerable Kingdom into a strong military power.

It will trace the origins and use of the Longbow from it’s beginnings in the rugged terrain of Wales through it’s ascendency in the English Order of Battle, and it’s unsurpassed supremacy upon both domestic and foreign fields of battle, through to its eventual decline in the wars of the 17th century, which were now coming to be dominated by “powder and shot”, and even touch upon the modern era, and how the rich legacy of England’s “Yeomen Longbowmen” is still felt in our society today.

"And God was with the boy, and he grew up. He lived in the wilderness and became an expert with the bow".

Genesis 21:20
Introduction

The Longbow was the weapon that made England the most powerful military nation in Europe during the middle ages.

Essentially, it is an extremely simple weapon made of readily available materials and wielded by common men. However, it is also a weapon that demands literally years of training in order to use properly upon the field of battle.

Looking at the above statements, we can see that there are a lot of questions as to how all of this happened. What were the circumstances that caused England, above all the other kingdoms of medieval Europe, to become so adept at archery? And to rely so heavily upon Bowmen in the Order of Battle?

In history, there have been a very few weapons that have made any sort of serious impact upon warfare and society as much as the famous English Longbow. In middle age England, there were two distinct military elites: The first of these being the heavily armoured, well equipped mounted knight, who was usually of noble birth. This professional warrior caste would be the medieval equivalent of the tank, and would rely heavily upon the “shock and awe” principle. When not actively engaged in conflict, they would hone their skills through taking part in tournaments of arms, war-games and fighting duels.

The second was the Bowman, lightly armoured and equipped and highly mobile, who was usually a commoner. These archers were like a cross between machine -guns and artillery of the middle ages, as they could bring a mass of concentrated fire to bear upon an enemy, but they could also be employed in the now classic “light infantry” roles such as skirmishers and snipers when and if called upon to do so.
Each of these military elites were subject to very strict training regimes from early childhood and each were to prove themselves extremely formidable upon the field of valour, but it would eventually prove to be the Longbowmen who would exert the most influence upon the outcomes of several pivotal encounters, so affecting the development of England, as well as several other European nations, and preserving and protecting her interests both at home and abroad.

The Birth of a Legend

Many were the strategies, tactics and techniques that went into to making the English army so adept and feared upon the field of battle, with English soldiery being particularly well-trained in various methods of combat with several different weapons of war. However, it would be the English Longbow that would ultimately be the weapon responsible for making the English army such a feared and respected fighting force, causing this relatively tiny kingdom to become one of the most powerful nations in the whole of Europe in the 14th and 15th centuries.

The origins of the longbow as a weapon of war are to be found in the savage beauty of the hills and valleys of Wales, because the welsh used the longbow to great effect, both in major engagements on the battlefield and in the classic “hit-and-run” tactics of guerilla warfare long before the armies of England ever would.

The first recorded account of the use of the longbow comes to us from the 7th Century. In the year 633 CE during a battle that took place between a combined force of Welsh and Mercians on the one side and the Northumbrian’s on the other, Orfrid, the son of Edwin of Northumbria was struck and killed by an arrow shot from a longbow.

Over four hundred years later, the Welsh longbow was to be successfully employed against Ralph, Earl of Hereford (sometimes referred to as “the timid”) in an ambush of his invading
Saxon horsemen in the Welsh mountains by Welsh longbow archers in 1054/5. According to the Abingdon Chronicle, during this encounter, the archers shot so accurately and strongly that the Saxons fled before they could throw their spears, hindered greatly by the fact they were on horseback. It is estimated that the Saxons suffered up to five hundred casualties while the Welsh suffered none. This was in many ways a portent of things to come, proving for perhaps the first time that cavalry were no match for well trained archers, well situated in terrain that favoured them.

Some ninety years later, Gerald of Wales (c. 1146 – c. 1223 CE) speaking of the bows used by the Welsh men of Gwent says:

"They are made neither of horn, ash nor yew, but of elm; ugly unfinished-looking weapons, but astonishingly stiff, large and strong, and equally capable of use for long or short shooting."

And again:

“In the war against the Welsh, one of the men of arms was struck by an arrow shot at him by a Welshman. It went right through his thigh, high up, where it was protected inside and outside the leg by his iron cuirasses, and then through the skirt of his leather tunic; next it penetrated that part of the saddle which is called the alva or seat; and finally it lodged in his horse, driving so deep that it killed the animal."

Later on, as will be mentioned later, the Welsh Longbowmen would also play a pivotal role in the Welsh wars of independence, led by the charismatic Owain Glyndwr at the beginning of the 15th century.
It would be this experience of being on the “Business-end” of this weapon then, that would be the first of a series of circumstances that would eventually lead to the longbows prominence in the armies of England.

The men of Wales used their longbows against the invading Normans from the moment they arrived, inflicting terrible losses among the mounted knights, and it was the grim recognition of this fact that caused Richard de Clare (otherwise known as “Strongbow”) to enlist the aid of trained Welsh longbow men when he invaded Ireland in 1170. It has even been suggested that it was his idea for the Welshmen of Gwent to increase the draw-weight of their bows, thus turning the standard “hunting” longbow, which had already proven it’s worth time and time again, into the devastating, fit-for-purpose war-bow.

Obviously, the invading Normans were no stranger to the use of the bow themselves, and had employed the short bow to great effect at the battle of Hastings, with William the Bastard instructing his archers to fire volleys of arrows high, so that they would rain down and penetrate the otherwise unbreakable shield wall of the Saxon army. So there is perhaps some credence to this idea.

It would be this experience of being on the “wrong-end” of this weapon then, that would be the first of a series of circumstances that would eventually lead to the longbows prominence in the armies of England.

It was King Henry 1st who first recognised and appreciated the potential of the longbow, passing a Law whereby “An archer at practice who accidentally kills a man is not to be held for murder or manslaughter”. This is the very first official royal encouragement of archery and, as we shall see, there would be a great deal more to come.
Anarchy!

Next in the chain of events leading to the longbow being adopted as the English weapon of choice was to begin with a shipwreck:

A vessel called the “White Ship” sank in the English channel in 1120. Aboard it were many nobles, among whom was the heir to the throne, one William Adelin. Of the estimated 300 passengers, only two survived and, among the dead was William himself. This was to prove absolutely catastrophic for the country as it caused a crisis of succession that would plunge England into what would become known as the 19 year winter, and would later be referred to by historians simply as “The Anarchy”.

Into this power vacuum stepped two major protagonists: Stephen of Bloir and the Empress Matilda, both of whom laid claim to the throne of England, and both of whom were prepared to pay any price to get their hands on it. Of course, to do this would mean having to raise armies: Large, well trained and well equipped ones. But how to gain the upper hand? How to gain the tactical edge through numerical superiority?

We need to appreciate that standing armies as we would recognise them today did not yet exist, as they would have been far to expensive to recruit, train, equip and maintain. Therefore, a standard armed force of the period would normally comprise of a small, elite Royal bodyguard, members of the nobility (knights and their retainers) and the various militias or armed citizenry and peasantry which were quite small in number and certainly not the most reliable of troops. However, the frequency, magnitude and scope of violent unrest in England at this time eventually gave rise to the need for more professional soldiers, and a ready supply of these could be found just across the Channel in war-torn Europe. At this particular time in history, numerous fledgling kingdoms were constantly trying to assert themselves through expansion and consolidation. Vying with one another to gain wealth, position and power. With this sheer amount of almost perpetual conflict throughout Europe,
it wasn’t long before groups of opportunist soldiers were forming themselves into well organised bands of mercenaries, enabling them to answer this urgent need of supply and demand. These fierce companies of soldiers would roam throughout the length and breadth of the various kingdoms selling their swords to the highest bidder.

These bands, then, far from being any kind of simple “militia”, were comprised of professional men-at-arms: Tough, well trained, battle hardened soldiers of fortune who were more than able to sway the odd’s in the favour of who-so-ever could afford to hire them, and many a King, earl or baron did just that.

England was to prove no exception to this rule, having now become engulfed by a bloody civil war, many hundreds of these bands of soldiers found their fortune waiting for them in the all-to-eager purses of both Stephen and Matilda. This prolonged period of unrest eventually meant that the kingdom was literally full of these mercenaries, who increasingly took to roaming the countryside in large, lawless groups, terrorising communities and helping themselves to what ever they wanted whenever there happened to be a slight “lull” in the fighting. Most importantly, they all had to be fed, quartered and paid, and this meant that the kingdom was slowly being bled dry economically (some of the Barons even resorted to issuing their own currency) as well as being in a state of complete and utter political chaos.

Indeed, one contemporary account says:

“They said openly, that Christ slept, and his Saints. Such things, and more than we can say, suffered we nineteen winters for our sins.”

Such was the terrible and terrifying time of the “Nineteen year winter” that lasted from 1135 to 1154.
Thankfully, all this was to change with the ascension of King Henry II to the throne. Henry, the first Plantagenet, was no one’s fool and he soon realised that if he was going to make England a more powerful nation, this would have to begin with re-establishing law and order in his own backyard first, and the faster the better.

He did this by establishing several important legal reforms, but the ones that concern us here are the following: The expulsion of the Mercenary bands from English soil, and making it illegal for the feudal barons to hire such bands thereafter, and the assize of arms of 1181.

Each of these acts, although never actually mentioning the longbow, would eventually contribute heavily to its development as a weapon of war.

The expulsion of the mercenary bands and the subsequent forbidding of their employment by the English lords and barons meant that, in effect, England was left almost completely impotent as a military power. Remember, as stated above: Without these soldiers of fortune to swell the ranks, the “army” (such as it was) would number only a very few thousand at best.

In answer to this, it is possible that Henry probably recalled the way the Saxon Kings (and, indeed, the Norman conquerors to a somewhat lesser extent) had made use of the “Fyrd”. The Fyrd (also sometimes referred to as the “Levi”) was a well armed and trained militia which could be readily mobilised and called into service at a moment’s notice in times of emergency. It was the Fyrd that had made up the bulk of the Saxon army in times of war, and it was an extremely effective military force, not to mention an extremely cheap alternative to hiring foreign mercenaries. Post Norman Conquest, these local Saxon militias had, perhaps unsurprisingly, come to be looked upon with a certain amount of suspicion, obviously due to them consisting entirely of Saxons who had little love for their Norman invader over-lords. Moreover, the sheer amount of full-time, professional soldiers of fortune had further caused
the traditional part-time soldiers of the Fyrd to be viewed as little more than incompetent amateurs.

Now, however, things were different. A lot of time had passed since the bloody battle of Hastings, a lot of “water” had passed under the proverbial “bridge”. Now, both Norman and Saxon co-existed in, at least for the most part, complete peace and harmony, with each proudly defining their identity as being “English”

Appreciating fully that a country that is not properly prepared for war might very soon find itself embroiled in one, Henry thought the time had finally come to re-introduce the idea of a strong, local militia, and this he did in 1181 through the statute of Law known as the “Assize of Arms”. Although not actually mentioning “Bows and arrows”, it does still give the right to certain people to keep and bear arms and armour, and it was thanks to this initial precedent that further legislation would be later introduced that would directly affect the development of archery. Chief amongst these a later assize of arms introduced by Henry III in 1252, which clearly states that all men between the ages of 15 and 60 should have to own and train with certain arms and armour and goes on to explain how this “Citizen army” will be formed up:

Commissioners of Array were to choose men to serve the King in his armies. Those who owned more than 40 shillings, but less than 100 shillings worth of land, must have a sword, a bow and arrows, and a dagger, as must townsmen or citizens owning more than 9 and less than 40 Marks of property. Yeomen or townsmen owning less than 40 shillings of land, or 9 marks in chattels, must have a bow and arrows.

Note: The term “Longbow” did not enter into common until usage the 15th Century

Now then the archer had, for the very first time, a firm place in the English Order of Battle, and the “Citizen Army” was at once both reborn and re-organised. When we look at this important development, we can appreciate that there might possibly be some negative aspects
to it: After all, a Citizen army is just that: A part time militia consisting of amateur soldiers.
But, these were ‘English” soldiers, and not some freebooting professionals from a far off land. They were loyal and obedient, proud and patriotic, and they would show themselves in years to come as being the very backbone of the nation itself.

The first king to use these new kind of troops to any real effect was Edward I, otherwise known as “Longshanks” given his large stature or, even more colloquially as “The hammer of the Scots” due to the protracted and bloody campaigns he conducted against those people. Indeed, it was against the Scots that he employed his archers to such devastating effect at the Battle of Falkirk in 1298:

The Scottish forces were commanded by the “Guardian of Scotland” Sir William Wallace. Although outnumbered, many of the Scots were seasoned veterans of previous battles against the English, and had even tasted victory in these, so they were certainly not going to run from an enemy simply because they were numerically superior.

Wallace chose his ground well, and organised his army, comprised mostly of spearmen, into the standard “Hedgehog” formations known as a “Schltron”. This formation had proven itself to be extremely effective against cavalry in the past, and today was to prove no exception, with the courageous charges of the mounted English Knights and men at arms consistently breaking against the forest of sharp, fiercely wielded scottish spear-points.

The Scots cavalry had, by this time, already abandoned the battle after an unsuccessful and (ultimately) completely foolhardy charge against the better organised and numerically superior English forces.

Seeing this, Edward ordered his archers forward, and had them fire directly into the hedghog formations. Immediately, the lightly armoured Scots began to incur heavy casualties, and their own archers, being no match for the enemy, turned and fled the field, leaving their
commrades to the terrible butchery that was soon to follow, as the weakened and broken
schitrons could now no longer resist the ferocity of the cavalry.

Eventually, those that still could, including Wallace, turned and ran into the comparative
safety of the nearby forest. Thus ended the Battle of Falkirk. This devastating use of the
Longbow against the Scots Shiltron would be repeated in other Engagements between these
two forces, most notably at the Battle of Halidon Hill (19 July 1333)

So, these new troops had now been “bloodied” in battle and proven themselves, although this
was still very much as a “supporting arm” of the Mounted knights, with their main
contribution being to soften up the enemy forces, it was still an important right of passage for
this fledgling formation. Many more Battles were to follow, including that of Bryn Glas (22
June 1402), in which the English archers would be beaten by their older Welsh counterparts
(commanded by Owain Glyndwr) due to them having the tactical advantage of higher ground
and, therefore, greater range

It would be sometime later, in the Hundred Years War (1337 to 1453) between England and
France, that they would really come into their own and be tactically appreciated. In the
interim period, however, they were to continue to further hone and refine their skills.

The Hundred Years War

It would be in the Hundred Years War that the Longbowmen of England would cover
themselves in glory not just once, but many times over, and cause the Longbow to become
one of the most iconic images of the English martial tradition.

Longbowmen played a part in this war, from very first engagement, the Battle of Cadzand
(November 1337). And the importance of the English Longbow cannot be underestimated
throughout the duration. It played a decisive role in many a battle, with the three most
important ones being Crecy, where they decimated the Genoese crossbowmen, (26 August 1346), Poitiers (19 September 1356) and Agincourt (25 October 1415), but also made important contributions in many others, including a Naval engagement, the Battle of Sluys (24 June 1340) were they helped to completely destroy or capture the ships the combined Franco/Genoese fleet, firing their shafts from the decks of the English vessels and so saving England from the threat of possible invasion. In still other battles they once again acted as a supporting arm for the infantry and cavalry, so enabling them to close with and destroy the enemy, such as at Auberroche (21 October 1345), where they conducted an important flanking manoeuvre, and Blanchetaque (24 August 1346) during which they provided covering fire to allow their comrades to successfully ford the river Somme and come to blows with the French who were holding the opposite bank.

All the while, England was steadily gaining a fearsome reputation as a military power, and most of this was thanks to their ranks of Longbowmen. Indeed, due to their special training and abilities, they were sought out as mercenaries by other kingdoms. The most famous of these groups was the “White Company” commanded by Sir John Hawkwood, which served in Italy and consisted of both Longbowmen and Men at Arms. Their tactical efficiency and effectiveness grew to such an extent that it became the archers that would make up the bulk of the army, with the standard order of battle reflecting this accordingly. To illustrate this point further: At the Battle of Crecy, the archers made up just over 50% of the English forces under Edward III (2,500 mounted and a further 5000 on foot, out of a total of about 14000 men) which was already a large number. But, at the Battle of Adincourt seventy years later, the ratio of Bowmen had increased to such an extent that it now made up 5/6ths of the total English force. It was thus that the English forces eventually became known as the “Archer Army”.

Because of this increasing tactical importance, and the nature of this long, drawn out conflict, it became increasingly important for people back home in England to train and become proficient with the Longbow, as well as to ensure a sustainable supply of the natural materials
required to manufacture their equipment, and it these aspects to which we will now turn our attention.

Training and Supply

“The might of Yngland standyth upon Her archers”

Sir John Fortesque 1478

In 1363, Edward the III, victor of the Battle of Crecy and, therefore, enthusiastic appreciater of the Longbow and the soldiers that shot it, introduced what is known as the “Second Archery Law” which states that:

"Whereas the people of our realm, rich and poor alike, were accustomed formerly in their games to practise archery – whence by God's help, it is well known that high honour and profit came to our realm, and no small advantage to ourselves in our warlike enterprises... that every man in the same country, if he be able-bodied, shall, upon holidays, make use, in his games, of bows and arrows... and so learn and practise archery."

This law ensured a constant supply of archers who were well trained and suitably equipped. The Longbowmen of England had, by now, proven their military worth, and were greatly appreciated as the specialist soldiers they were. They were extremely well paid (at the time of Crecy, a mounted archer was paid Sixpence a day and a foot archer a “Groat” or fourpence). This was important, as it took great strength and stamina to be a Longbowman which, in turn meant that they required sufficient monies to keep themselves well fed, even when not engaged in a military campaign. A further testament regarding the high esteem in which a good Longbowman was held can be found in what we know about a certain “William Jauderell” who was an archer in the army of Edward, the Black Prince, in the 14th century, and who owned land in both Macclesfield Forest and Cheshire. His grave is to found at the
Church of St James in Whalley Bridge, Derbyshire, wherein it is marked by an impressive plaque giving details of not only himself, but also of other members of his family, most notably, that of his son, Roger, proudly stating that he fought at Agincourt. We can see from this that becoming an archer enabled the common man to become a wealthy land owner who was much honoured not only by the local community, but by the very highest echelons of society as well. Even more importantly is a surviving document from the time of his military service: On 16 December 1355, the Black Prince gave him leave to travel to England by means of a special pass which his family proudly retains to the present day. The translated modern text reads:

“Know all that we, the Prince of Wales, have given leave on the day of the date of this instrument, to William Jauderel, one of our archers, to go to England. In witness of this we have caused our seal to be placed on this bill. Given at Bordeaux 16 December, in the year of grace 1355.”

This is an absolutely crystal clear demonstration of exactly how well thought of the archers of the time were, and is akin to an ordinary, private soldier being given a personal letter of safe conduct signed by the fieldmarshal himself.

As we can see from the 1363 law above, archers were trained almost literally from birth, with the size and draw-weight of the bow steadily increasing as the child grew to maturity. While the Longbow was a very personal weapon that would have reflected the size and strength of the individual archer, an average length would have been about 6ft (1.80m) with the arrows being half that length (3ft/90cm).

Longbows were what is known as “self” bows, as they were manufactured from a single piece of wood rather than being made of a “composit” of materials. The usual wood chosen was Yew, as this consists of both “hard” and “soft” elements, so lending the finished product strength and durability. They would have a draw-weight of over 120 pounds (55kg) with an
effective range of up to 240 yards (210 Metres). This makes it a very powerful weapon, and means that it would take a strong, well trained person to use it properly.

As already stated: An English Longbowman commenced training from a very early age, so gradually building up the necessary musculo/skeletal strength required. In addition, the English archer had developed a special way of what they termed “bending” their bow by “leaning” or “sitting” into it first, so using their whole body to accomplish the task rather than relying solely upon the strength of their arms and shoulders alone, and it is thought that this is why English archers often referred to “Bending the bow” rather than “drawing the bow”. The wood of the Longbow had a coating of wax or tallow to help protect it from the elements, and was usually transported in a cloth or skin. When not in use, they would be “unstrung” in order to both maintain its power and protect the string which, itself, was made from Hemp and soaked in glue to add strength and protection. When in battle, the archer would bring this string back to his ear, unlike the archers who used the shortbow (as at the battle of Hastings) who would draw back to their chest, or modern archers who draw to the mouth (“kissing the Bowstring”). Drawing such a powerful bow back so far enabled the archer to shoot an arrow that would travel at as much as 140 miles (210Km) per hour.

The first arrows used were those with a “broad-head” but, while these were suitable for hunting, or shooting against an unarmoured enemy, it was found that they were of little use against an assailant protected by chainmail or plate armour. Therefore, the narrower “bodkin” point arrows were developed with the “long-bodkin” being used against mail and the “short-bodkin” being used against plate. Another type of arrowhead, known as the “swallowtail”, was specially designed for use against the enemies horses, a strategy that was employed by archers in several engagements, especially in flanking actions, as the armour of a warhorse was (much like the tanks of today) a lot weaker at the side than at the front. Once the horse was felled, the dazed rider was a much easier prey for not only arrows, but the swords, maces and battle-axes of their comrades in arms. At times, such as at the Battle of Agincourt, the archers would discard their Longbows and engage the enemy with their own swords and
“bucklers” (a special type of small shield), for the English Bowmen were also renowned for their ability with these weapons. Indeed, at the Battle of Auray (29 September 1364), the English Longbowmen found the French armour almost impenetrable with their arrows so they cast aside their bows, and, rushing on the French, took their battle axes from them and, using these captured weapons, defeated them in fierce hand to hand fighting.

Indeed, with the development of more and more efficient plat armour, this idea of flanking the enemy, and of taking down the horse rather than the rider, must have gathered momentum. It is probably for this reason that archers at the time were commonly deployed upon the flanks of the army, with the cavalry and infantry occupying the centre of the battle formation.

While an archer would probably always carry about two dozen arrows on his person (There were 24 arrows in a “sheaf”), prior to a battle taking place, he would be issued with 60-70 arrows, and he was expected to be able to fire up to twelve in a minute (this is the absolute “maximum” however, and could not be expected to be sustained for very long as this would have exhausted not only the archer and his supply of arrows too quickly). Archers were always placed in the most advantageous position for their combat role, that meaning it had to be one whereby they could bring the maximum amount of concentrated firepower down upon the enemy while, at the same time, remaining relatively safe and protected by the terrain, supporting infantry and cavalry, and rows of sharpened stakes which were usually driven deep into the ground in front of them in order to deter both men and horses. Archers would dig some of their arrows in the ground around them, which made for fast, easy access as well as ensuring that the tips were dirty, thus increasing the chances of infection to those unlucky enough to be hit by them. The arrows were made from a variety of woods such as Poplar, Elder, and Willow for longer-range work and the heavier woods like Ash for the shorter range as these would have much more of an impact. The fletchings were 7-9 inches, and were tied and glued to the shaft and were feathered most commonly with goose, although swan and peacock were also used. Two articles of Law concerning the making of arrows were the
“Regulations for the Making of Serviceable Arrowheads”, which was introduced by Henry IV in 1405, and a further degree by Henry V in 1416, stating that “Aspen wood should be reserved only for making arrows, and not used for patterns or clogs”

All of this meant that the woods used in the production of both Longbows and Arrows would need to be constantly replenished to ensure a ready supply. Indeed, in 1356 the Black Prince ordered the arrest and forced labour of all fletchers in the county of Cheshire until his supply of arrows could be replenished! By 1450 though, there seemed to also be a shortage of Longbowmen: When Edward IV asked for 20,000 archers to be recruited, they could only muster 13,000. It was, perhaps, as a direct result of this that, a few years later in 1456, he made a decree that the playing of any sports or amusements be proscribed for all males between the ages of 12 and 60, and that they should all use the time and energy to practice archery instead.

As for the Yew trees (the main wood from which the Longbow was made) many church's were required to plant Yew trees around the perimeter of their Graveyards and, later still, when native supply was beginning to run a bit dry, the English were forced to rely upon foreign imports with the first such documented case being in 1294. However, even with the use of other woods such as Hazel and Ash for practice bows, by 1350 there was a very serious shortage indeed, with permission being granted for officials to enter private land in order to harvest any Yew trees they found there. As we have seen, the Hundred Years War with France had enabled the English Longbow to carve itself a place in the fabric of our history. However, by the end of this war, gunpowder was already beginning to make its presence felt and, at the very last engagement of this conflict, the Battle of Castillon (17 July 1453), the English forces led by the Earl of Shrewsbury, were decimated by the French cannon, it was becoming obvious that the use of the Longbow in battle, while still useful, would need to be seriously revised.
It was this battle, the most recent in a line of victories for the French, together with the beginning of the Wars of the Roses (1455–1485), that England relinquished any claim it had to the Crown of France, and gave up all territories save for the Port of Calais and the Channel Islands. Now, then, just as had happened so often in the past, Englishman would kill Englishman upon strictly domestic battlefields.

Obviously, the Longbow was still utilised in these wars by both the House of Lancaster and the House of York. At St. Albans, in 1455, Henry VI. and many of his nobles were wounded by the archers. At Towton, in 1461, Lord Falconbridge employed the cunning ruse of having his Yorkist Longbowmen shoot their arrows and then immediately withdraw. When the enemy archers tried replying with their own volley, they found that their arrows fell some yards short of their intended targets, and soon emptied their quivers in completely in vain. Falconbridge then continued with the initiative and advanced almost entirely unhindered, with his own archers actually picking up and using some of the enemies spent arrows.

Consequently, with all these actions taking place, the need for men and materials continued to be important until, in 1472, such was the shortage of materials that the “Statute of Westminster” was introduced, by which every ship entering an English port had to bring four Bow-Staves for every tonne of goods.

Eleven years later, in 1483 Richard III decided to link the import of wine with the supply of Bow staves, ordering that: “All merchants are to import 10 good bowstaves with every butt of Malmsey or Tyne wine” and, in 1503, it was decided that “Customs Duty would not be levied on Staves longer than 6ft (1.80m)” and, in the same year, the use of crossbows was forbidden to any except Lords and Landowners. All of these Laws aided greatly in ensuring there were, once again, enough raw materials to manufacture Longbows. Henry VII was the first Tudor Monarch, and the it would be the Royal House of Tudor that would help see to it that archery continued to survive in England right up to the present day.
The Tudors.

"Shooting is an art necessary for the knowledge of all sorts of men, useful both in peace and war. It is an honest pastime for the mind, and an wholesome exercise for the Body, not vile for great men to use, nor costly for poor men to maintain, not lurking in holes and corners, for ill men at their pleasure to misuse it, but still abiding in the open fight and face of the world, for good men (if it be any way faulty) by their wisdom to correct it."

The Art of Archerie by Gervase Markham (1568-1637)

We have already seen how Henry VII effectively waived the tax upon the importation of bowstaves, but it would be his son and heir, Henry VIII who would do the most to encourage and preserve the art of the longbow in the Kingdom.

Henry VIII was, as we all know, an extremely physical man, and prided himself upon being proficient at most contemporary martial arts and sports. He was especially fond of both Wrestling and Archery and in 1509 he commenced making annual payments to a small company of Archers called the “Fraternity of St. George”. These payments were made every 23rd April to encourage their practise of the Longbow. In 1537 King Henry VIII formalized these arrangements, granting a Charter in the name of the “Fraternity and Guild of Saint George” later known as the “Honourable Artillery Company of London” which still exists to this day as part of the Household division (albeit that they now use modern artillery pieces rather than Longbows!). The actual word “artillery” comes from the French “Arc tirer”, meaning to pull or draw the bow. In 1515 Henry introduced an amended version of the archery law of 1363:

“Item: Whether the Kinges subjectes, not lame nor having no lawfull impediment, and beinge within the age of XI yeares, excepte Spiritual men, Justices etc. and Barons of the Exchequer, use shoting on longe bowes, and have bowe continually in his house, to use himself and that
fathers and governours of chyldren teache them to shote, and that bowes and arrowes be bought for chyldren under XVII and above VII yere, by him that has such a chylde in his house, and the Maister maye stoppe it againe of his wages, and after that age he to provideb them himselfe: and who that is founde in defaute, in not having bowes and arrowes by the space of a moneth, to forfayte xiid.. And boyers for everie bowe of ewe, to make two of Elme wiche or other wood of meane price, and if thei be founde to doe the contrarie, to be committed to warde, by the space of viii daies or more.

And that buttes be made, in everie citie, towne and place accordinge to the law of auncient time used, and the inhabitantes and dwellers in everye of them to exercise themselve with longe bowes in shotinge at the same, and elles wher on holy daies and other times conveniente.

And that al bowstaves of ewe, be open and not solde in bundels nor close.

And that no stranger not being denizen, shall convey oute of the kinges obeilance (?) anie bowes, arrowes, or shafties without the kinges speciall license upon paine of forfaiture, and also imprysonment nor use shotynge in anie longe bowe without the kinges license, uppon paine to forfaite the bowes and arrowes to the kinges subjectes that will Seaze them.

The Statute thereof is ANNO 6. H8. Cap:2.’

Indeed, Henry did a great deal to preserve and encourage both the martial and sporting aspects of the Longbow. Perhaps the most important aspect of archery training, at least in the martial sense, would have been the ability to keep a good length over any range. Therefore shooting at a fixed target, or “pricking” as it was termed, was not deemed as important as “roving”, meaning to move across areas of rough ground shooting at marks of unknown and varying distances. This training ensured that the English Longbowman was always suitably prepared for action when and if called upon.
As already stated above, Henry enjoyed the practice of archery very much himself and, in 1520 CE, during the historical meeting between the French King Francis I and himself, known as the “Field of the Cloth of Gold” Henry very ably demonstrated his ability with this weapon by repeatedly hitting the centre of a target at a distance of 240 yards (220m)

Henry VIII then, even while the rest of Europe was beginning to concentrate more and more upon gunpowder and firearms, still stubbornly continued to ensure that the legendary English archer remained a vital part of the Kingdoms military tradition, with Longbowmen continuing to play an important part in the countries Order of Battle. This is best illustrated by the sheer amount of Longbows which were found upon the raising of his ill-fated Flagship, the “Mary Rose”, upon which were found more than 137 well preserved Longbows and over 3,500 arrows!

The draw-weight of these Longbows bears testimony to the great strength required to use such a weapon: A staggering 150 - 160 Pounds! Skeletons of these archers were also recovered, and showed how their bodies had been physically modified over long years of training in order for them to be able to perform effectively with this lethal weapon, with bone “spurs” having developed upon on their shoulders, wrists and fingers, a distinct thickening of the bones of the left forearm and twisted spines. All courtesy of regular archery practice with the Longbow.

In 1541, Henry even made archery exempt from his newly introduced “Gaming Law”, making it the only game or pastime a person could practice on Christmas Day and, in 1545, the first book to be written in English concerning archery entitled “Taxophilus or the Schole or Partitions of Shooting” was published by a certain Roger Ascham, whom Henry had appointed as tutor to his daughter

Ascham was an expert Longbowman as well as being a lecturer at St Johns College, Cambridge, and had penned this book in order to try and discredit the notion that archery was
not a sport which suited a scholar. He dedicated the work to the King himself who not only approved of the book but granted Ascham a rich pension of £10 a year for writing it.

Queen Elizabeth I was, like her father before her, was an extremely proficient Archer and very fond of her tutor. When he eventually died in 1568, it is said that the Queen remarked:

"I would rather have cast ten thousand pounds into the sea than be parted from my Ascham".

Henry VIII died in January 1547 and September that same year would see the Battle of Pinkei Cleugh, in which, for the final time, the English Longbowmen played their part as massed ranks of archers.

Shortly after, Elizabeth I came to the throne, and was to become, first and foremost, a strong, warrior Queen. Recognising that the time had at last come for the kingdom to move forward with the times, she instigated certain changes in the armed forces who, at last, began to seriously adopt cannon and modern firearms in preference to the English Longbow.

In 1628 the 1515 Statute of Henry VIII requiring archery practice was reinforced and in 1633 Charles I issued yet another new order; for the use of bows in the Trained Bands, with training to be provided by a master bowman.

Indeed, a new company of pikemen also armed with bows (the ‘double-armed man’) was formed by the Royalist army in Herefordshire as late as in 1642, seeing action shortly thereafter at the Battle of Bridgnorth (October 1642) which was to be the last recorded use of the Longbow by company of archers on English soil with the last action on British soil being the Battle of Tippermuir which took place in Scotland on 1 September 1644.
In 1692, Charles II issues an “Act for ordering the Forces in the several Counties of the Kingdom” With the weapons mentioned including swords, muskets and pikes. No mention of the Longbow is to be found, and the end of a glorious era had at last come to pass.

Interest in the Longbow as a combat weapon in times of war did, indeed, still persist. For example, during the Napolionic wars, the Duke of Wellington actually requested that a corps of archers should be raised only to be told that “Such men do not exist in England anymore”. Even with its inevitable demise as a battlefield weapon, the Longbow remains deeply ingrained in our psyche as a nation, and this is probably best illustrated by not only the legends and folklore concerning the swachbucluing adventures of Robin Hood, but also in a much later story, the so-called “Angels of Mons”. A legendary phantom army that appeared at a time when the British troops were fighting a desperate retreat, and the line was about to break.

It is even rumoured that the game of darts had its origin in archery: Archers, having been strongly “encouraged” by Henry to practice their skills as much and as often as possible, started to establish target practice near the local ale-houses, as well as their normal “Butts”. However, due to England’s often inclement weather, and the very real need to keep their Longbows safe from the elements as much as possible, they were sometimes forced to abandon their practice and seek shelter inside. Not being able to use their Bows in such confined spaces, it is conjectured that they took to throwing their arrows at an improvised indoor target, that being the bottom of an empty beer barrel. Over time, they adapted their arrows for this indoor practice, and this new game of throwing the arrows, or “darts” started to catch on. It is said that even Henry himself enjoyed a game and that, in 1530 Anne Boleyn (soon to be his wife) actually presented him with his very own special set of “darts”

As a “Passing shot” (if you will pardon the pun!) for the Longbow as a battlefield weapon, there is an account of it being effectively used in a 20th century conflict: During World War Two, a certain Captain (Later Lt. Colonel) “Mad” Jack Churchill is accredited with signalling
the beginning of an ambush by killing a German Sergeant with the Longbow he always carried with him (He also carried a sword!). In addition, there is the “Company of Archers” who proudly form the Monarchs ceremonial bodyguard whenever she visits Scotland, and the many Longbow clubs and societies that continue to thrive not only in the British Isles, but in Europe and North America as well.

Last, but by no means least, there is the modern olympic sport of archery which, although very different from the more purely martial aspects of the Longbow, is still very much an ofshoot (yes, I know, another pun!) of the older, warlike art, and so owes a great deal to it.

**Conclusion**

It is obvious that the English Longbow exerted a huge influence upon the development of England and the United Kingdom, but also upon several other European nations. As far as the English Order of Battle was concerned, it caused a seismic shift from reliance upon the mounted, heavily armoured knight of noble birth, to the lightly armoured, common foot-soldier known simply as an archer.

Economically, this was perhaps the most successful of military reorganisations ever in the entire history of warfare that, at once, meant less money had to be spent upon heavy armour and expensive “chvalric” weapons such as the Lance and the Longsword, and that some of this money could instead be channeled into paying the Longbowmen a decent wage, so enabling them to not only buy the type of foods they needed in order to maintain their great strength and stamina, but also to begin climbing up the social ladder by steadily buying more land and becoming more wealthy.
It this manner, the Longbow was responsible for the liberation of the common man, who would, before this time, have been born, lived, worked and died while remaining in almost exactly the same station and situation of life. Certainly, the French were absolutely appalled not only by the tremendous loss of life that was suffered by the noble class at battles such as Crecy and Agincourt, but also because these losses had been caused by arrows shot at them by common men.

Therefore, the adoption of this weapon, and the training and selection of the men who used it, not only helped to make the small kingdom of England a martial power that was feared upon the battlefield, but also helped to reshape the countries political and economic system as well, with the repercussions of this being felt throughout the other warring kingdoms of Europe. However, such was not to be the case in Holyland:

In the East, during the Crusades, it was to be a different story entirely: The stout but (for the most part) static archers of England and their famous Longbow would encounter the mobile mounted archer of the Saracen army, with their short, composite bows. Fired from Horseback, these bows were far more efficient in this type of “dessert” warfare. A mounted archer could approach suddenly, fire a volley of deadly shafts, and retire to safety usually long before the Longbow men had even formed up to offer any retaliation. However, there were to be some outstanding successes. For example, according to the noted historian Edward Gibbon, Richard I performed great exploits with his archers in the Holy Land, where 300 archers and 17 knights headed by the king, sustained the charge of the whole Turkish and Saracen army. But, such exploits were to prove very much the exception rather than the rule in this hot and violent religious war. With the mounted archer usually proving to more than a match for the English Longbow.

In recent times, there has been something of a renaissance concerning European martial arts, with an increased awareness of our own western martial identity and rich history at last giving rise to a long overdue recognition and celebration of an (almost) lost warrior tradition.
And this can only be a good thing. Yes, there are a few (shall we say?) “questionable” individuals claiming rather dubious family traditions in these arts, but they are far outnumbered by the numbers of honest, decent people who are doing their best to keep these traditions alive through research and experimentation. Such efforts are to be applauded and are of very real worth historically, archaeologically and anthropologically, because they cast a much needed light upon a very precious treasure.

I can personally testify to the undoubted strength and skill required to shoot this weapon effectively, having actually had a go myself. The experience was a real eye-opener, as the Longbow I was attempting to shoot only had a draw-weight of 70lbs (roughly half that of the traditional medieval warbow) and it took literally everything I had to do this, and all my arrows were dismally off-target, which was only a short distance away. After only a a few shots I was completely exhausted, and my arms, shoulders, back and even legs ached dreadfully for some days after (even after a good stretch-out!). I can only imagine what it must have been like upon the feudal field of battle, seeing the heavily armoured enemy galloping towards you with blood and death in their eyes, fully intent upon hacking you to pieces if they managed to get close enough.

An archer, having to maintain their composure in such a demanding and stressful situation demonstrated an inner-strength at least equal to their physical prowess. Time and time again, they stood their ground and won the day.

I have studied the oriental martial arts throughout my life. They have given me a great deal of pleasure and I consider myself very privileged to have learnt so much from them. But, I am also very proud to be a part of the rich martial tradition of the British Isles as well. And nowhere better does this warrior tradition find expression than through the art and practice of the Bow. Long may it be so.
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Non-Ballistic Deadly Force as it Applies to Martial Artists

Key words: Non-lethal weaponry, Martial Arts, Law Enforcement, Self Defence, Personal Safety.

John M. Landry, Ph.D., FIMAS

Abstract

Deadly force might be necessary and a firearm is not always available. Martial Artists must know when to use deadly force and how to apply non firearm (ballistic) weapons, to include empty hand techniques, to stop or render harmless a deadly force threat. Techniques and anatomy are discussed in this paper.

Acknowledgements

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Mr. Loren Christensen
Introduction

Martial artist might have to defend themselves at some point in their lives. Certain martial artists, those in police or military service, are almost guaranteed to have to defend themselves during the course of their career.

There is some mis-information that exists in the body of knowledge such as the Fairborn Table of death. The information contained might have been the most accurate at the time but modern researchers and physicians do not agree with the short time frames listed in the table. Extensive research by the United States Military and other organizations has concluded that the length of time that it takes for someone to actually die from some of the listed injuries is much greater than what was once thought.

Without proper training and understanding of how force is looked upon in legal circles and what exactly constitutes excessive force, martial artists could find themselves to be in severe trouble and under arrest for charges arising from a situation where the martial artist was simply trying to defend him or herself.

Defense is one thing; excessive force is another thing altogether. When one person attacks another person, for whatever reason, the attacker may be legally resisted by the defender; however, if the defender becomes too aggressive or uses too much force in defense of themselves, then the defender might be legally considered the attacker.
This is an issue that must be addressed and one that should be part of any martial arts instructor’s curriculum. I would suggest anyone teaching martial arts to have a consultation with an attorney and/or a law enforcement officer from the jurisdiction where the instructor teaches to learn what constitutes too much force in a self defense situation.

**What is Deadly Force?**

Deadly force is force which could cause great bodily harm or death. Great bodily harm could be a permanent disfigurement or permanent injury. That could even be broken bones or injuries that will never heal properly.

**Why Use It?**

To stop or render harmless a deadly force threat which is presented to you or another person.

**Is it Legal?**

In the United States, using reasonable and necessary force to protect yourself is generally legal. However, each legal jurisdiction is different and local laws must be followed. Internationally, use of force laws are very diverse and applicable to that nation only.

**What Stops People?**

The person might suffer pain; however, pain alone does not always stop a deadly force threat.
The person cannot see; that is not actually stopping the person but impeding the person’s ability to identify the target (you) and accurately deliver whatever the attack is that the attacker wishes to deliver to the victim.

The ability to move: This can certainly help the defender to survive or more importantly to escape and eliminate the ability for the attacker to harm the defender.

The ability to breathe: Once the attacker cannot breathe he cannot fight.

The ability to remain conscious: The attacker must be conscious to continue the attack.

The ability to circulate blood: If the attacker suffers enough blood loss then the attacker will stop.

Myths and Facts

One of the greatest myths seems to be that a palm heel strike to the base of the nose will drive the cartilage up inside the brain and kill the person. That simply will not work.

One hit, one kill, type mentalities are dangerous. Combination (complex) techniques are warranted in most self-defense scenarios especially the deadly force scenarios addressed in this paper.

The facts are showing an extreme resistance to instant stopping power delivered by any means other than a complete severing of the spinal cord or a well placed projectile (bullet) the cerebral cortex of the brain (usually via a sniper’s shot).
If a human is determined to keep going and to keep attacking you, there are very few
guarantees that will stop that person. Pain compliance, pressure points, and any lees-lethal,
or lower force options may not suffice for you to survive.

**Technique Suggestions**

The techniques needed to stop or render harmless a deadly force threat must be effective and
efficient in stopping the threat immediately.

Techniques that affect the attacker’s ability to see, breathe, move or circulate blood are most
appropriate. The defender’s objective must not be to kill, or maim, but to simply survive the
deadly force attack; therefore, the motivation of a defender is not the same as a soldier
attempting to kill the enemy but simply to survive a deadly force encounter.

Punitive techniques, those to punish, are not generally legal or lawful and must be avoided.
The code of ethics that martial artist must follow dictates that any over-use of force against an
attacker is not justified or morally accepted. Force to defend yourself or another person is
generally lawful as long as it is only enough force necessary at the time of the attack to stop
the attacker and render the deadly force threat harmless.

Now if the attacker sustains a serious injury as a result of their attack against you, then it will
be up to the court of jurisdiction to decide if your defense was legal and lawful; however, if
you do not survive the deadly force attack then any legal liability you might be subjected to would certainly be a moot point as you will no longer be alive to have the sanctions imposed on you.

The Shaolin Temple’s code of force stated that you should:

Avoid, rather than check.

Check, rather than hurt.

Hurt, rather than maim.

Maim, rather than kill.

For all life is precious; nor can any be replaced.

That ancient philosophy is still very relevant in contemporary law, as well as contemporary ethics.

Modern American Combatives, LLC Tactical Target Anatomy™

Human beings can endure a significant amount of trauma before actually stopping, losing consciousness, or dying. To properly and effectively, as well as legally, deliver techniques in a self-defense encounter, the martial artist must learn proper anatomy form a tactical target perspective.
Below is a list of targets and techniques. Also included is a supplemental Tactical Target Anatomy™ table for quick identification of appropriate deadly force targets.

The chart’s information might surprise you if you only consider deadly force techniques and targets designed to kill. Killing is not what is discussed within this paper; stopping a deadly threat against an innocent victim is what is being discussed in this paper. Remember that the objective is never to kill as a civilian or law enforcement officer, but to stop a threat against an innocent person or a person engaged in lawful activity or performing a lawful duty.

**Possible Targets**

- Crown of head
- Temples
- Seams where skull grows together
- Eyes
- Bridge of nose
- Ears
- Arteries
- Joints
- Limbs
- Hands
- Ankles
- Foot smash to hands
- Elbows,
- Arms,
- Knees,
- Achilles Tendons

Table 1 – Anatomical Targets and Techniques to Use Against Them

<table>
<thead>
<tr>
<th>Target Name</th>
<th>Target Location</th>
<th>Tools to Use</th>
<th>Expected Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crown of Head</td>
<td>Skull</td>
<td>Impact Device</td>
<td>Unconsciousness</td>
</tr>
<tr>
<td>Base of Skull</td>
<td>Rear Skull Area above Neck</td>
<td>Stabbing Device, Impact Device</td>
<td>Unconsciousness</td>
</tr>
<tr>
<td>Carotid artery</td>
<td>Both Sides of Neck</td>
<td>Stabbing Device, Cutting/ Slicing Device, Impact Device, Flexible Instrument, Empty Hands, Shin, Boots</td>
<td>Blood loss, shock, unconsciousness</td>
</tr>
<tr>
<td>Carotid Sinus</td>
<td>Both Sides of Larynx (front of neck)</td>
<td>Empty Hands, Cutting/ Slicing/Stabbing Instrument, Impact Device</td>
<td>Unconsciousness, Blood Loss, Shock</td>
</tr>
<tr>
<td>Trachea</td>
<td>Front of Neck below Larynx</td>
<td>Empty Hands, Cutting/ Slicing/Stabbing Instrument, Impact Device,</td>
<td>Unconsciousness, Blood Loss, Shock, Lack of Breathing</td>
</tr>
<tr>
<td>Subclavian Artery</td>
<td>Under Clavicle Notch in Chest</td>
<td>Stabbing Instrument</td>
<td>Blood Loss, Shock, Unconsciousness</td>
</tr>
<tr>
<td>Axillary Artery</td>
<td>Under Arm (Armpit)</td>
<td>Stabbing Instrument</td>
<td>Blood Loss, Shock, Unconsciousness</td>
</tr>
<tr>
<td>Brachial Artery</td>
<td>Inside of Bicep</td>
<td>Cutting/Slicing Instrument</td>
<td>Blood Loss, Shock, Unconsciousness</td>
</tr>
<tr>
<td>Location</td>
<td>Side/Position</td>
<td>Instrument/Device Used</td>
<td>Possible Outcome</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------------------------</td>
<td>----------------------------------------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>Radial Artery</td>
<td>Thumb Side or inner Wrist</td>
<td>Cutting/Slicing Instrument</td>
<td>Blood Loss, Shock, Unconsciousness, Loss of use of hand</td>
</tr>
<tr>
<td>Ulnar Artery</td>
<td>Pinky Finger Side of Inner Wrist</td>
<td>Cutting/Slicing Instrument</td>
<td>Blood Loss, Shock, Unconsciousness, Loss of use of hand</td>
</tr>
<tr>
<td>Inside Elbow</td>
<td>Bend of Inner Arm</td>
<td>Cutting/Slicing Instrument</td>
<td>Blood Loss, Shock, Unconsciousness, Loss of use of Arm</td>
</tr>
<tr>
<td>Clavicle</td>
<td>Collarbone, Top of Each Shoulder</td>
<td>Impact Device</td>
<td>Inability to move one or both arms</td>
</tr>
<tr>
<td>Groin</td>
<td>In-Between Legs to the Front</td>
<td>Cutting/Stabbing Instrument, Impact Device, Empty Hands, Boots</td>
<td>Shock</td>
</tr>
<tr>
<td>Femoral artery</td>
<td>Inner thigh deep</td>
<td>Stabbing Device</td>
<td>Blood Loss/shock/Unconsciousness</td>
</tr>
<tr>
<td>Popliteal Artery</td>
<td>Behind Knee</td>
<td>Cutting Device</td>
<td>Blood Loss/shock/Unconsciousness</td>
</tr>
<tr>
<td>Achilles Tendon</td>
<td>Below calf and above heel to rear</td>
<td>Cutting device/Impact Device</td>
<td>Instability of foot, possibly not able to stand, run, or walk</td>
</tr>
<tr>
<td>Top of Foot</td>
<td>Instep of foot</td>
<td>Boot, Impact device</td>
<td>Instability of foot, possibly not able to stand, run, or walk</td>
</tr>
<tr>
<td>Back of hand</td>
<td>Reverse of Palm</td>
<td>Impact Device</td>
<td>Inability to use hand if bones are fractured</td>
</tr>
<tr>
<td>Inside of Wrist</td>
<td>Palm side of arm</td>
<td>Cutting instrument</td>
<td>Loss of Use of Hand Shock/Blood Loss</td>
</tr>
<tr>
<td>Temple</td>
<td>Side of Skull</td>
<td>Impact Device</td>
<td>Loss of Consciousness</td>
</tr>
<tr>
<td>Fingers</td>
<td>End of Hands</td>
<td>Cutting/Slicing Instrument, Impact Device, Empty Hands, Boots</td>
<td>Breakage/Lack of use</td>
</tr>
</tbody>
</table>
Table 2 – Fairbairn’s Timetable of Death

*This table is no longer accurate based on recent research. The times for bleed out and unconsciousness are usually much longer than presented in this table.*

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of Artery</th>
<th>Size</th>
<th>Depth below Surface in Inches</th>
<th>Loss of Consciousness in Seconds</th>
<th>Death</th>
</tr>
</thead>
<tbody>
<tr>
<td>1...</td>
<td>Brachial</td>
<td>Medium</td>
<td>1/2</td>
<td>14</td>
<td>1/2 Min.</td>
</tr>
<tr>
<td>2...</td>
<td>Radial</td>
<td>Small</td>
<td>1/4</td>
<td>30</td>
<td>2 &quot;</td>
</tr>
<tr>
<td>3...</td>
<td>Carotid</td>
<td>Large</td>
<td>1 1/2</td>
<td>5</td>
<td>1 1/2 Sec.</td>
</tr>
<tr>
<td>4...</td>
<td>Subclavian</td>
<td>Large</td>
<td>2 1/2</td>
<td>2</td>
<td>3 1/2 &quot;</td>
</tr>
<tr>
<td>5...</td>
<td>(Heart)</td>
<td>-----</td>
<td>3 1/2</td>
<td>Instantaneous</td>
<td>3 &quot;</td>
</tr>
<tr>
<td>6...</td>
<td>(Stomach)</td>
<td>-----</td>
<td>5</td>
<td>Depending on depth of cut</td>
<td></td>
</tr>
</tbody>
</table>

**Fig. 112**

**Conclusion**

The use of deadly force by a martial artist must be effective and efficient and most importantly only utilized when legally and lawfully necessary.

The martial artist must know when to use deadly force, where to use deadly force, how to use deadly force, why to use deadly force and who to use deadly force against. If the martial artist does not understand and know these factors as they relate to deadly force techniques, then the martial artist could face the loss of his or her life by not being able to effectively defend
against deadly force threat, or the loss of his or her freedom by not legally and lawfully using deadly force when appropriate.

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