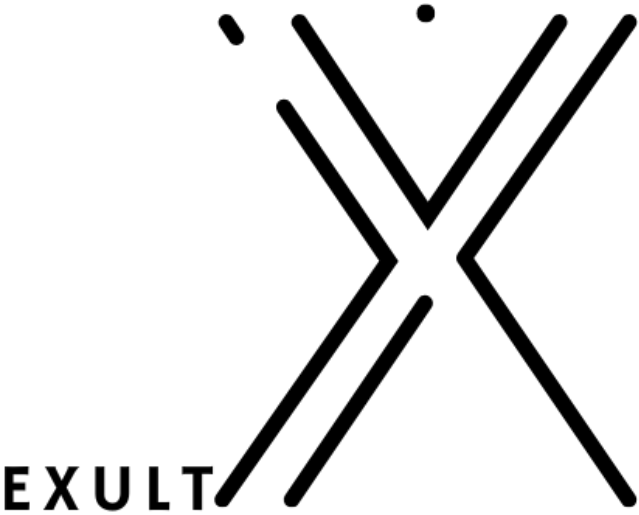
FORGING TACTICAL READINESS THROUGH TIME

A timeline synthesis

An ExultX Publication

Forging Tactical Readiness Through Time[1]



An ExultX Publication

ExultX would love to hear what we can do to improve the quality of this eBook. Share your thoughts about this publication by emailing us at info@exultx.com.

[1] How to cit:
ExultX (2024). Forging Tactical Readiness Through Time. URL: https://www.exultx.com

CONTENTS

NOTE: This eBook is a free edition. Any attempt to make a profit from it should be reported on our website: www.exultx.com.

Preface

This eBook is a aggregation of years of research, practice, and advancements in the field of physical training specifically tailored for those who dedicate their lives to tactical professions.

In an ever-evolving landscape, the demands placed on tactical populations – ranging from military personnel to law enforcement officers, firefighters, security personnel, and beyond – have transformed dramatically. The necessity for a multitude of physical requirements accompanied by a specific mindset is not merely a goal but a vital component of survival and operational success. This eBook explores the rich history and progressive evolution of physical preparation, providing a comprehensive overview of the operational strategies, tactics, and methods that have influenced the development of physical preparation and how it has been refined over centuries.

Preface

Starting from the ancient origins where physical fitness was intertwined with combat readiness, we journey through significant periods of history. Each chapter reveals how different eras contributed to the foundations of modern physical training techniques. The final chapter offers valuable content and insights into future developments, allowing readers to understand potential next steps in this field.

By presenting the evolution and rationale behind these training methodologies, the eBook provides some valuable insights and practical guidance for everyone involved in tactical settings.

Physical fitness and readiness are not just about passing fitness tests or meeting minimum standards; they are about building a foundation for efficiency, resilience, and longevity in operational careers. Although the length of this publication doesn't allow for a detailed exploration of every aspect of the proposed timeline, it highlights the major points in a comprehensive way. It encourages you to reflect on the lessons from history and

consider how you can use this knowledge to improve your training practices.

This eBook serves as a valuable resource, contributing to the ongoing development and enhancement of training programs for tactical populations and fostering a better understanding and dissemination of this crucial topic.

CFA, 2024

Introduction

“Forging Tactical Readiness Through Time” is an exploration of the historical and scientific evolution of physical preparation for tactical populations and tactical athletes. It is designed to serve as an educational resource, spreading critical concepts and methodologies that have defined the training and readiness of tactical professionals throughout history.

While it might appear that this eBook is primarily focused on military physical readiness and preparation, it is important to recognize that the military has a longer history and more extensive information available compared to other tactical populations. The principles and methodologies developed for military training have significantly influenced the physical preparation of law enforcement officers, firefighters, security personnel, and other tactical professionals.

The scope of the eBook spans from ancient civilizations to contemporary tactical populations,

illustrating how physical training methods have been shaped by technological advancements, scientific discoveries, and evolving tactical requirements. The goal is to provide a comprehensive overview that captures the essence of how these practices have developed and been refined over the centuries. It aims to synthesize extensive historical and scientific information into a concise format, acknowledging that some intermediate developments and lesser-known milestones may not be exhaustively covered. However, the intention is to highlight the most significant periods, figures, and innovations that have contributed to the modern understanding of tactical fitness.

Key themes include the integration of exercise science principles, such as specificity, into tactical training, as well as the influence of notable pioneers in exercise science like Kenneth Cooper, Mikhail Matveev, and Tudor Bompa. The text also examines the impact of global events, such as the World Wars and the Cold War, on the evolution of training methodologies.

Introduction

By delving into the rich history of tactical fitness, this book aims to equip tactical trainers, strength and conditioning coaches, operators, commanders, political leaders, scholars, and enthusiasts with a deeper understanding of the foundational principles that underpin current tactical physical training practices. This understanding is essential for the continued advancement and optimization of physical preparation programs in tactical settings.

While this edition provides a synthesized narrative, it remains grounded in scientific research and historical analysis, ensuring that readers gain a robust and evidence-based perspective on the development of tactical readiness.

While this journey through time aims to uncover the critical advancements that have forged the path to modern tactical fitness, we hope that it also inspires further research and application, ensuring that the legacy of tactical readiness continues to evolve and enhance the capabilities of those who serve and protect.

Introduction

Thank you for engaging with this scientific discourse on the evolution of tactical physical preparation.

Until the next edition, stay fit, stay strong, and stay ready!

Chapter 1

Ancient Origins: Physical Fitness and Combat Training

Ancient civilisations recognised the importance of physical fitness and readiness mainly for combat purposes. Luckly we can trace the history of physical preparation for tactical athletes back to them.

In ancient Greece, the military strategic approach to warfare included the use of phalanx formations, which required soldiers to maintain close ranks and move in unison. This tactical formation demanded exceptional strength and endurance to hold heavy shields and weapons while marching long distances.[1,2] Taking this battle requirements, Greeks, particularly the Spartans, held physical fitness and combat training in high regard. Spartan warriors underwent rigorous training from an early age, with a focus on strength, endurance, and combat skills. The Agoge was a Spartan education system that trained warriors to be physically strong and

mentally tough for war.[3] Spartans trained in running, wrestling, and weapons every day from age seven and joined the Army at 20. However, not all Greek city-states focused solely on war training like the Spartans. But athletics were an integral part of Greek society, and the culmination was the festivals, which the more important was the Olympic Festival. These festivals had various competitions, such as running, wrestling, chariot race, and battle drills, and were held in stadiums.[4] To prepare the athletes, they already have coaches. Philostratus described an 11-month pre-Olympic preparation in his book *Gymnasticus Discourses*. His training plan spanned 10 months of purposeful training and a final month of central preparation. In both periods, he proposes a 4-days training cycle with a sequence of small, medium and large workloads and emphasizing the importance of a structured and disciplined approach. Nevertheless he underscores the role of experienced coaches and mental and psychological preparation.[5]

The Roman Empire also placed great importance on physical fitness and combat training. Roman Legionnaires are considered as the first professional soldiers.[6] They had a daily intense training, combining physical exercises (running, jumping and carrying heavy packs), marching drills, and weapons practice.[7] In that era, separate strength and speed training were proposed by Claudius Galenus[2].[5] But the Romans recognised soldiers had to possess, not only strength but also agility, and endurance to face the demands of battle and long campaigns. The Roman military training system also included gymnastics, swimming, and weapon proficiency, and has the purpose of keeping the soldiers physically fit for the demands of battle.[8] One of the key skills that any Legionnaire must have had, was the capacity to speed march, much because of the tactical Roman, manipular tactics, which largely depends on a

[2] The Preservation of Health by Claudius Galenus is regarded as a precursor to modern strength training periodisation. The author divides his exercises into two categories in this treatise: strength exercises without speed and intense exercises. In the first category, he focuses on developing speed apart of strength, while the second aims to integrate both strength and speed[5].

swift and precise deployment of forces as a unit. The capacity of enduring foot marches full equipped it was critical. Knowing that, train under full combat load (between 10-20Kg) it was also part of their physical preparation.[6]

But not only Europe developed physical fitness for those armies.

In ancient Asia, various martial arts disciplines emerged, each emphasising physical conditioning and combat skills. For instance, in China, systems such as Shaolin Wushu developed as comprehensive training methods encompassing strength, flexibility, balance, and combat techniques. These systems emphasised discipline, mental focus, and the harmonisation of mind and body.[9]

Ancient India had a rich martial tradition that incorporated physical training as an integral part of combat readiness. The ancient texts, such as the Arthashastra and Dhanurveda, contain references about martial arts and detailed the importance of physical

conditioning for warriors. Training methods included various forms of exercise, wrestling, archery, and martial arts, and physical fitness was essential for effective combat performance and overall well-being.[10]

In all these ancient civilisations, physical fitness and combat training were not merely practical necessities but also held cultural significance. Physical prowess was admired and respected, and warriors were expected to embody the ideals of strength, discipline, and endurance. These attributes not only enhanced their battlefield performance but also showed their dedication to their communities and the defence of their respective civilisations. The physical training practices of ancient civilisations, such as the Greeks and Romans, played a significant role in shaping subsequent approaches to military preparation. Their emphasis on physical fitness, combat skills, and discipline set a foundation for future training methodologies.

Chapter 2

From the Middle Age to the Napoleonic Wars: The Birth of Systematised Training

Despite the Middle Age was rich in great battles and wars, it was not a period of big innovation at the warrior preparation or science fields. On the battlefield, there were several evolutions, like the appearance of the cavalry and later the artillery.[11] However, the only ones who were deemed professional in warfare were the knights. They serve in a large variety of roles, such as home guard, police officers, enforcers, and soldiers. Most often, they fought wearing a heavy armour (between 15-60kg) and riding a horse. Logically, to combat wearing that armour, they need to possess great strength, power, and agility. The knight's education curriculum it was based on horse riding, swimming, archery, climbing (ladders, ropes, and poles), fighting

techniques (mounted fighting and ground fighting), wrestling and fencing.[6]

In Asia, between 12th and 14th centuries, the Samurai ideology dominates the social sphere in Japan. The Samurai, as Spartans, Legionnaires and Knights, had only one purpose: get ready for war. Bushido, the underlying ideology, was based on the triad of Chin, Jin, Yu, which stands for wisdom, benevolence, and courage. From a young age, samurais are educated in fencing, spear handling, archery, jiu-jítsu, horse riding, tactics, and ethics. The main aim of this education was learning to fight simultaneously with a firmness of character[3]. Mastery in the handling of two swords of varying sizes was achieved through practice and the purpose of meditation, also known as dhyana in Japan, was to encourage self-knowing, self-control, and serenity while reaching thinking zones that were beyond verbal expression. Military professionalisation begins at around

[3] The core values of Bushido were righteousness, justice, courage, benevolence, honour, loyalty, self-control, and self-knowledge[12].

five, with children wearing a real Samurai sword at their waist. But only on their 15th they were totally independent and responsible for their actions.[12]

In contrast to the Middle Age era, the Renaissance, which spanning from the 14th to the 17th centuries, witnessed a renewed interest in humanism, individualism, and pursuing knowledge. It was a time of great exploration, discovery, and cultural exchange. The rediscovery of ancient Greek and Roman texts, along with advancements in science and anatomy, led to a greater understanding of the human body and its potential for physical development.[13]

During that period, the proliferation of fortification, the growing importance of defensive tactics on the battlefield, the high cost of hiring mercenary troops, and the cautious nature of their leaders are factors that clarify why warfare in Europe persisted for over a century, with no clear outcome. The soldier was aptly characterised as someone who had to sacrifice his life to sustain his livelihood. His state was no superior to that of the

peasants he oppressed. The armies were persistently degenerating, disintegrating due to fatalities, injuries, ailments, scattered movements, and desertion. Their actions were not determined by strategic planning, but by pursuing unexplored overseas territories, which ultimately resulted in the navy's creation.[11]

Humanism redirected learning towards a focus on the individual and the broader human experience, emphasizing that physical exercise should be for everyone, not just knights or soldiers, also accentuating his importance in education. Their educational systems included various physical exercise programs inspired by new views on life and society. In continental Europe, gymnastics became the dominant form of exercise, while in England, sports took precedence. These differences were influenced by distinct social circumstances, highlighting the utilitarian values of both sports and gymnastics.[14]

Through the Renaissance, several key figures emerged who made significant contributions to the

exercise sciences, such as Leonardo da Vinci[4], François Rabelais[5], Girolamo Mercuriale, John Locke, George Turnbull, Jean Jacques Rousseau, Johann Bernhard Basedow, Christian Saltzmann, and Johann GutsMuths, and others. We will focus at the more significant ones.

Girolamo Mercuriale, an Italian physician, wrote "De Arte Gymnastica" in 1569. His work established the groundwork for physical therapy and played a significant role in the development of structured exercise training by highlighting the significance of physical fitness.[15] This publication was the pioneer in documenting the benefits for health and the application of physical exercise to prepare for war.[6]

[4] There are a million things that we could say about the role of Da Vinci in the contemporary sciences in multiple fields. But this isn't the core of this paper, so we will just say that he did formidable work, although it wasn't all recognized at his time living, in the field of anatomy, physiology, movement analysis, and biomechanics.[15][16]

[5] He published two important novels, Pantagruel (1533) and Gargantua (1535) where he advocates the physical nature of the human and the physical demands to war, proposing jumping, wrestling, running, swimming, gymnastics, and lifting training to get ready for war.[6]

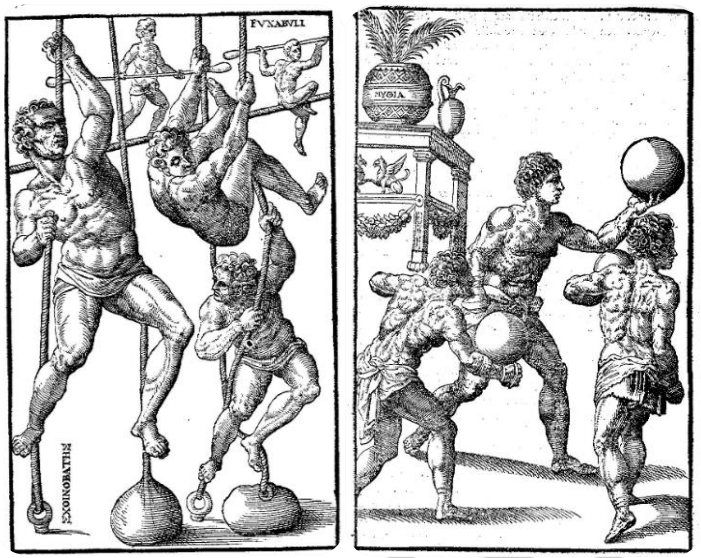


Illustration 1, Representations of exercises from the book: De Art Gymnastica.[15]

He categorised exercises into three types: legitimate (for overall well-being), military, and athletic. Furthermore, he was the first to introduce the term “medicine ball” to characterise the weighted ball utilised in his exercises.[6] Mercuriale's classification of exercises into military categories reflects an early recognition of the need for specific physical preparation for soldiers, linking physical fitness directly to military effectiveness.

The theory of biocentrism emerged in the early 18th century during a time of changing social relationships and traditions. It proposed that people

recognize natural impulses and the need to play, discovering themselves and their world through experiences valuing freedom and voluntary movement. Though not entirely new, these ideas gained prominence through thinkers like Locke and Rousseau, who challenged the notion that physical exercise hinders mental activity.[14]

The movement started by John Locke will have a profound impact on many of his followers, including Turnbull and Rousseau. The mentioned movement advocates for the indispensability of physical exercise to invigorate both the mind and body, while also fostering traits such as bravery, determination, and robustness. But the first to apply these theories was Johann Basedow at the end of the 18th century. The Philanthropin was an educational institution created by Basedow which had the mission of educate the children of Prussian families integrating the mind and the body. Philanthropin is the birthplace of modern gymnastics and physical education. But the biggest revolution of the Gymnastics still had to

come by a German educator and physical training advocate called GutsMuths.[6]

Johann Christoph Friedrich GutsMuths made significant contributions to the field of physical training through his development of *Gymnastics for Youth*. GutsMuths approach emphasised the holistic development of individuals through gymnastics exercises and laid a big contribution to the modern concept of the holistic approach of wellbeing. He, like Locke, Turnbull, Rousseau, and Basedow in their own time, believed that German society was deeply inactive during the 19th century. He defended the need to fight the sedentary life and the change of the educational system, arguing that the last one was creating people with lots of knowledge but with a fragile body. The educational system was neglecting the body education and because of that the youth was deeply fragile.[6,16]

Gymnastics for Youth aimed to cultivate a well-rounded set of physical attributes. GutsMuths emphasis

on comprehensive physical education development aligned with the cognitive education.[16]

Gymnastics for Youth was written on several key principles: first, it promoted the idea that physical training should be enjoyable, accessible, and inclusive for all individuals, regardless of age or ability; second, it emphasised the importance of a systematic approach to training, with exercises progressing from simple to complex; third, GutsMuths highlighted the significance of proper technique and form to ensure safety and optimal results. It comprised various components aimed at developing different physical qualities. These components included exercises for strength, flexibility, balance, coordination, and agility. GutsMuths understood the interconnectedness of these components and believed in the importance of training them in harmony to achieve overall physical development. The exercises incorporated in *Gymnastics for Youth* focused on bodyweight movements,

apparatus-based exercises, and rhythmic gymnastics elements.[16]

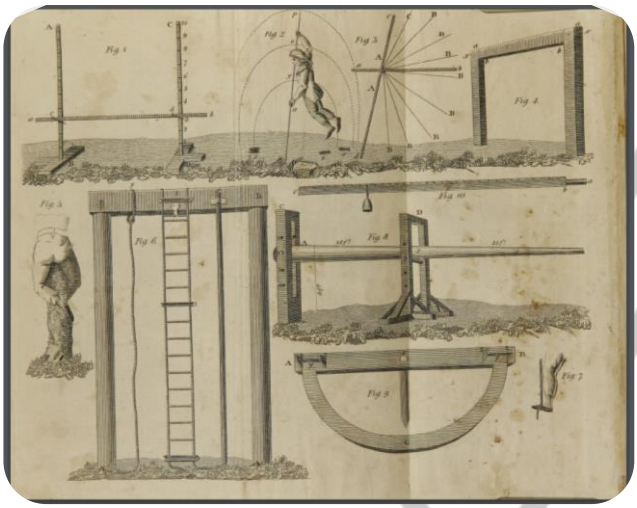


Illustration 2, Representations of some exercise apparatus from the book: Gymnastics for Youth.[16]

GutsMuths method propose specifics military exercises likewise cadence exercises, long foot marches, and war games to promote subordination, patience, resilience, and courage at the youth.[16] The renown of GutsMuths and his approach quickly disseminates throughout Europe and reaches Denmark through Franz Nachtegall (1777-1847), who persuaded the Crown Prince of Denmark to establish the Institute of Military Gymnastics in 1804. Because of the success of

the institute and the high quality of its officers, physical training was introduced into every elementary school in Denmark fourteen years later. Pehr Henrik Ling (1776-1839) became acquainted with the system of gymnastics created by GutsMuths during his time in Denmark. He also becomes skilled at fencing in there. These experiences led him, in 1813, to suggest the Swedish Board of Education to teaching gymnastics in schools. After a year, the King appointed the Royal Central Institute of Gymnastics to serve the purposes of both public education and the military.[6]

Meanwhile, there are certain events that have had a direct impact on all of this. The confluence of political, economic, and social crises throughout Europe resulted in a pervasive crisis of authority and values by the conclusion of the Thirty Years' War in 1648. Complex reasons behind European expansion and maritime rivalries for two centuries, such as religious fervour, greed for plunder, and the desire for legitimate trading profit, were reduced to a straightforward power struggle

between states. The primary contenders in this conflict were the Dutch, English, and French. Trade was favourable as it not only elevated the prosperity of individual merchants but also reinforced the dominance of the state which, committed to protecting and advancing trade, could engender additional wealth.[11,17]

The Peace of Westphalia, signed in 1648, marked the end of the Thirty Years' War in Europe. This series of treaties had profound implications for the political and military landscape of the continent. One of the key outcomes was the recognition of the sovereignty of states, which led to a significant reorganization of political power. States began to centralize their authority and formalize their military structures, moving away from reliance on feudal levies and mercenary forces to establish standing armies. This shift towards professional, state-controlled military forces necessitated a systematic approach to the training and preparation of soldiers. The development of these standing armies required comprehensive training

programs that could ensure soldiers were physically prepared, disciplined, and capable of executing complex tactical manoeuvres.[17]

The need for efficient and effective training regimens became more pronounced as states sought to enhance their military capabilities and assert their power in an increasingly competitive international system. The Peace of Westphalia also influenced the social contract between the state and its military personnel. Soldiers were now seen as integral parts of the state apparatus, leading to improved conditions, regular pay, and structured training routines. This professionalization laid the groundwork for modern military training methods, linking physical preparation directly to strategic and tactical requirements on the battlefield. [17]

The Peace of Westphalia laid the foundation for the emergence of ethnocentrism. Ethnocentrism focuses on the importance of the nation, shaping physical exercise to serve national goals. As nations grew stronger, there was an increasing need to physically educate citizens

who could serve as soldiers if needed. Key figures in this movement include Franz Nachtegall, Pehr Henrik Ling, Friedrich Ludwig Jahn, and Miroslav Tirs. They founded various gymnastic systems aimed at developing young people physically to support social goals and ideals. Their approach emphasized the nation over the individual. Even today, physical exercise programs inspired by ethnocentrism persist in several military contexts.[14]

By the late 18th and early 19th centuries, Europe was once again embroiled in war. The French Revolutionary and Napoleonic Wars began when France declared war on Austria in 1792. The military conflicts of this era, including the Napoleonic Wars, emphasized the importance of systematic physical training for soldiers, as armies required well-conditioned troops capable of enduring long campaigns and executing complex tactical manoeuvrers. Soldiers were trained to march long distances with heavy packs, approximately 20 to 30 kg. Marching was a fundamental part of their training

because mobility and rapid movement were crucial for Napoleon's military strategies. They often covered up to 15-25 km a day. In addition to marching, regular drills were conducted to ensure soldiers were proficient in battlefield manoeuvrers. This included formations, bayonet practice, and coordinated movements, all of which required both physical endurance and discipline. Physical conditioning was emphasized to build endurance and strength, with activities such as running, jumping, and carrying weights.[18]

It is important to note that while physical conditioning was important, the extent and systematization of training could vary significantly among different units and periods. The focus on physical training as described may reflect ideal conditions rather than the inconsistent reality faced by many soldiers.

Chapter 3

From Napoleonic Era to World War I

In opposition to ethnocentrism, it was also during the 19th century that the theory of egocentrism emerged. Egocentrism focuses on individualism and personal identity. In sports, which emphasize competition and personal achievement, people find a way to express their individuality. This has led to the rapid expansion of sports. In the 19th century, England developed a specific system of games and sports, especially in public schools. This system spread throughout the British Empire, promoting values like fair play, dignity, individual effort, and courage. Thomas Arnold, an influential educator at Rugby School, and his follower Thomas Hughes, played key roles in this development. While ethnocentric physical exercise was dominant in continental Europe, Pierre de Coubertin's visit to England in 1884 inspired him to promote sports in France. This led to the first modern Olympic Games in Athens in 1896.[14]

Nevertheless, after the Napoleonic Wars, Europe was not completely free of wars. Examples include the Crimean War, the Austro-Prussian War, and the Franco-Prussian War. Meanwhile, the Industrial Revolution brought advancements in transportation and logistics, affecting how armies were supplied and moved. This reduced the emphasis on soldiers carrying heavy loads over long distances.[19] Despite this, marching remained a fundamental skill required from soldiers.[6]

Many European armies sought to professionalize and standardize their training regimens. This included more systematic approaches to drilling, marching, and physical conditioning. Formal physical education programs began to be introduced in military training. These programs emphasized general physical fitness, including exercises to build strength, endurance, and agility. Some armies started to introduce gymnastics and athletic training as these concepts became more widespread. These activities were seen as ways to improve overall fitness, coordination, and discipline. [19]

By the late 19th century, military training began to incorporate more scientific approaches. It was also during this period that evidence of structured physical training for law enforcement forces, similar to army training, began to appear.[20,21] This included structured physical training programs, often developed with input from physical education specialists and medical professionals. It was also in this period, and influenced by egocentrism movement, that modern sports, such as football (soccer), boxing, and track and field events, were integrated into tactical populations programs. These sports were used to build physical fitness, teamwork, and competitive spirit.[6,19]

Georges Hébert (1875-1957), a French naval officer and physical educator, revolutionized the field of physical training through his development of the Natural Method. Hébert's approach aimed to cultivate practical skills, functional movements, and adaptability in individuals, enabling them to perform optimally in real-life situations. This method doesn't focus only on the

physical capabilities but also on the behaver of the people. Georges Hébert was inspired by his experiences observing the physical prowess and capabilities of indigenous people during his travels. Hébert's Natural Method sought to align training with natural human movements and instincts, emphasizing practical skills for everyday life, disaster and war scenarios.[22]

Hébert's method was structured in three phases: firstly, it emphasized the use of natural movements that are instinctive and functional, allowing individuals to adapt to a variety of physical challenges; secondly, the method aimed to develop physical qualities that encompassed all major muscle groups and systems of the body; thirdly, Hébert stressed the importance of progressive training, gradually increasing intensity and complexity to achieve optimal results. This three phases was organized in ten groups of exercises, namely, walking, running, bearing, jumping, climbing, balancing, throwing, lifting, wrestling and swimming.[22]

These components were designed to simulate real-life movements and situations, enabling individuals to develop practical skills. This method pretends to be universally applicable, from the scholar institution to the army.[23]

Georges Hébert's Natural Method continues to influence modern training methodologies for all tactical populations. Elements of the Natural Method are incorporated into contemporary physical training programs. The emphasis on adaptability and functional movements remains integral to preparing tactical populations for the challenges they may face in their respective roles.

Chapter 4

World Wars and Advancements in Physical Preparation

The World Wars (WW) of the 20th century marked a pivotal period in the history of tactical populations' physical preparation. The conflicts introduced new warfare strategies and technologies, demanding soldiers to possess physical attributes beyond traditional training methods.

The WW forced military forces to adapt and develop new physical training methods to meet the challenges of modern warfare. The unprecedented scale and intensity of combat demanded soldiers with superior physical attributes, such as strength, endurance, and agility. As a result, physical preparation programs underwent significant transformations to enhance soldiers' combat effectiveness and resilience.[6]

During World War I, many operational changes occurred. The war focused on attrition warfare, aiming to

exhaust the enemy through prolonged engagements and blockades. Logistics relied heavily on extensive trench systems, limited mechanization, and railroads for supply lines, with horse-drawn carriages being common. The warfare was characterized by static front lines and high casualties from direct assaults on entrenched positions.[24]

By contrast, World War II emphasized total war, involving entire societies and economies in the war effort. Strategic bombing, amphibious assaults, and nuclear weapons were pivotal in achieving victory for the Western Allies. Logistics became more advanced with widespread use of trucks, tanks, and airplanes, becoming faster and more efficient with improved infrastructure and technology. The introduction of blitzkrieg tactics, with rapid, coordinated attacks combining air power, tanks, and infantry, led to fast-moving front lines and significant territorial gains.[25]

Contrary to what was expected, these changes led to an increase in the equipment load carried by

soldiers, as shown in illustration 3.

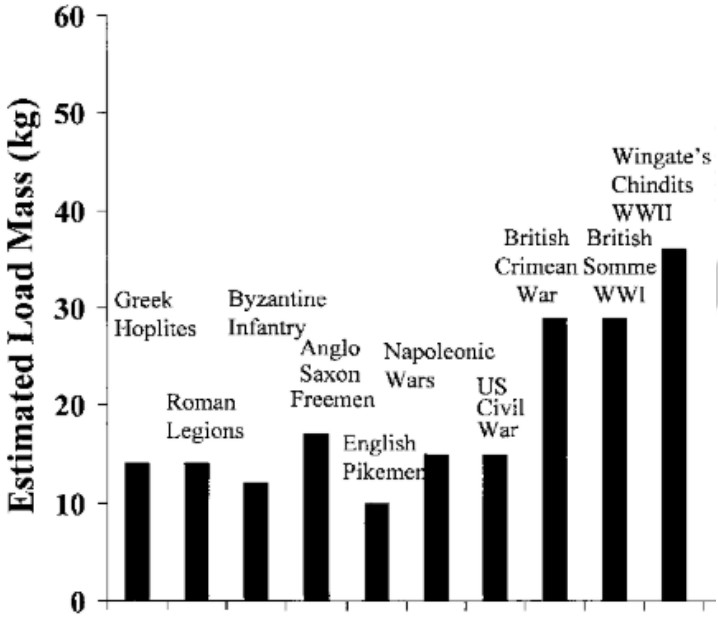


Illustration 3. Average loads carried on the march by various infantry units. Adapted from Knapit and colleagues 2004.[26]

It was in that period that the Major General Wood from United States Army write:

"there is nothing in the education of the soldier of more vital importance than this [physical fitness]."[6]

Apparently, during this warlike period physical training as gained a prior importance for some of the higher military ranks.

If World War I laid the foundation for modern military fitness with exercises designed for trench warfare, the interwar period saw a decline in fitness standards. This situation reversed at the onset of World War II, prompting a renewed focus and the beginnings of a structured and scientifically grounded approach. During this period, the roots of an emphasis on comprehensive physical, mental, and social fitness began to emerge.[6]

Still, after the World War I it was recognized that fitness tests were necessary to determine whether operators of military and law enforcement were physically prepared for their duty and that activities such as group games, wrestling, and hand-to-hand combat were necessary adjuncts to the callisthenic exercises used at the time. As a result, minimum physical standards were established for a physical fitness tests.[20]

The WW highlighted the critical role of endurance in military operations, as soldiers were required to engage in prolonged marches, perform physically demanding tasks, and sustain combat operations. Additionally, the importance of strength training in the physical preparation of tactical populations was also recognized. Leaders and trainers realized that soldiers needed sufficient muscular strength to handle heavy weapons, equipment, and engage in close combat. Endurance conditioning and strength programs, such as long-distance running, calisthenics, obstacle courses, and field training exercises, became essential to improve soldiers' cardiovascular fitness, stamina, and strength. This methodology was also widely applied in law enforcement forces.[20]

During the second half of the 20th century, a new theory called anthropocentrism was proposed. This theory places humans at the center of the world, combining elements of ethnocentrism, biocentrism, and egocentrism. It emphasizes:

1. Physical health and abilities
2. Social progress
3. Skills in sports and games
4. Leadership and cooperation
5. Recreational skills for leisure

This approach prioritizes health and happiness as essential for human life, suggesting that all physical exercise should support these goals. It originated in Scandinavia and North America, focusing on human needs. In the late 20th century, O. Åstrand and K. Cooper developed exercise programs based on these principles, followed by Jane Fonda's programs for women. Today, these ideas are reflected in various fitness programs.[14]

These advancements underscored the critical role of physical readiness in ensuring combat effectiveness and resilience but one of the biggest contributions to exercise science during this period came from the endocrinologist Hans Selye. He introduced the stress theory which set the basis for the General Adaptation Syndrome (GAS). His work was widely used and applied

by many sports scientists during the Cold War period in the construction of most of the theories and knowledge that we use and apply nowadays.[20]

Chapter 5
Cold War period

The Cold War was characterized by a complex interplay of strategies and tactics employed by both the United States (US) and the Union of Soviet Socialist Republics (USSR) to gain geopolitical advantage without engaging in direct military conflict. During this period, the international political system was considered bipolar, with soft and hard powers centered in these two superpowers. After two world wars, Europe was politically, economically, socially, and infrastructurally devastated and in recovery.[27]

The world had passed through two world wars, leading to the US adopting the strategy of containment, which included economic support through the Marshall Plan to reduce the appeal of communism in war-torn countries. Both superpowers possessed sufficient nuclear arsenals to destroy each other, leading to a doctrine of mutually assured destruction (MAD) that

maintained a precarious peace. To avoid direct confrontation, the US and the USSR engaged in proxy wars by supporting opposing sides in regional conflicts.[27]

This era saw extensive espionage and intelligence gathering, propaganda efforts, an arms race, and the formation of military alliances such as the North Atlantic Treaty Organization (NATO).[27]

Sports were extensively used as a tool for political ideology propaganda during this time. This led to huge investments in research, particularly from USSR, resulting in an incredible amount of advancements in exercise sciences that revolutionized the way exercise professionals understand training, and later influenced all the knowledge of training methodologies.[28]

To refer to some of them, we can talk about Kenneth Cooper, a doctor of medicine and former Air Force Lieutenant Colonel, who introduced the concept of aerobic exercise to the general public, emphasizing cardiovascular fitness, and popularized the Cooper test, which is still used in several tactical settings nowadays.[29]

Mikhail Matveev's contributions to sports science, especially his development of periodization theory, have had a profound impact on the field. Tudor Bompa’s periodization model – Bompa's work on the systematic planning of athletic training cycles to peak performance at specific times – revolutionized training regimens.[30]

Karpovich's research on the physiological responses to exercise was revolutionary and influenced training methods and sports performance.[31]

The concepts of plyometric training and the shock method from Yuri Verkhoshansky, along with his influence on supercompensation theory and block periodization, were significant during this period.[32]

Dr. Izumi Tabata's research in the late 1990s built on earlier Cold War era concepts of interval training, demonstrating the efficiency of High-Intensity Interval Training (HIIT) for improving both aerobic and anaerobic fitness.[33]

During this period, several government initiatives emphasized the importance of physical fitness for

national security, reflecting the Cold War ethos of preparedness and excellence. These advancements during the Cold War era laid the groundwork for modern sports science and exercise methodologies, influencing how athletes train, perform, and maintain their physical and mental health.[34]

Later in this period, there was possibly a progressive understanding between tactical leaders, trainers, and the sports science community. This relationship culminated in the complete integration of scientific methods, leading to an increased focus on the scientific study of exercise physiology to optimize tactical physical training programs. There was also an improved understanding of the role of nutrition in enhancing performance and recovery in tactical populations, and the development of specialized training programs for different branches of the tactical forces. This was only possible because of interdisciplinary approaches, leading to collaboration between tactical trainers, sports

scientists, and medical professionals to develop comprehensive training programs.[20]

Physical training saw significant technological advancements, leading to the development of new equipment and training programs. Standardized strength circuits and standardized combat obstacle course training became common in each regiment.[6] However, this technological development also led to new equipment, such as weapons, protective gear, communication systems, and so on. This resulted in increased weight for operators to carry. Mental resilience training, particularly in military settings, became prominent, incorporating psychological methods to build toughness through physical activity.[20]

Also, standardized fitness tests underwent many changes to ensure consistent assessment of physical capabilities, allowing for regular monitoring of progress and readiness.

This era was also rich in fitness and sports culture, leading to the adoption of civilian fitness trends to

enhance performance — a practice that continues today. This perspective led to the emergence of athlete subcategories associated with professions, such as industrial athletes, occupational athletes, athlete warriors, and soldier athletes. Some of these terms are still in use. For example, occupational athletes encompass all physically and physiologically demanding jobs.[20]

It is finally during this period, based on the concept of occupational athletes, that the physical preparation of law enforcement officers, firefighters, and emergency personnel saw its biggest change. This led to the emergence of the concepts of “tactical athletes” and “tactical populations” in the early 21st century has we will see in the next chapter. [20]

Chapter 6

09/11 and a new readiness paradigm

The terrorist attacks of September 11, 2001, shocked the world and highlighted the need for increased preparedness among all tactical populations. Nevertheless, it was the Madrid Train Bombings in 2004 and the London Bombings in 2005 that compelled European governments and organizations to re-evaluate their approaches to European operators' readiness. After these events, there was a shift in the definition of the enemy and the threat. If until 1991 there was a well-defined enemy, terrorism brought us into a period of uncertainty about who and where the threats were. Logically, this represented a huge change in training protocols to address emerging threats, but this was only possible with unprecedented international collaboration. This collaboration leads to the rapid integration of advanced technologies into the preparedness of tactical populations, encompassing areas such as

communication, surveillance, personal protective equipment, and simulation training.[35]

It was not only the importance of physical and technical readiness that was highlighted but also the need for mental and psychological preparedness. Tactical populations faced unprecedented levels of stress and psychological demands. The uncertainty of who the enemy was leads to high levels of stress both in military operations, such as the Freedom Operations, and in the day-to-day activities of law enforcement officers. Consequently, efforts were made to enhance resilience, mental toughness, and psychological well-being. Programs focusing on stress management, cognitive skills training, and psychological support became integral components of physical readiness training. By addressing the psychological aspects, tactical populations were better equipped to handle the challenges and pressures associated with their roles.[20]

Despite strength training already being introduced in military settings, the knowledge among tactical fitness

instructors is often empirical. Because military training is many times applied in the context of a platoon, especially during courses, physical training tends to focus on muscular endurance and cardiorespiratory fitness. Understanding the need for well-structured strength training for these populations, the National Strength and Conditioning Association (NSCA) started a process to promote the importance and benefits of comprehensive strength and conditioning training. This training aims to improve overall job performance and reduce injury rates among tactical populations through the development and implementation of the Tactical Strength and Conditioning (TSAC) program.[20]

The TSAC program began in 2005, aiming to educate professionals to train and prepare tactical athletes to meet the physical demands of their occupations. This initiative was a response to the unique challenges faced by personnel in roles such as SWAT, special operations, conventional military forces, law enforcement, and fire and rescue services. Its holistic

approach ensures well-rounded development and optimal performance in high-stress environments, with resistance training improving muscular strength, power, endurance, and overall tactical performance. The program's protocols emphasize occupational specificity, tailoring training programs to the specific physical demands of different tactical roles. This involves performing needs analyses and designing training regimens that address the unique requirements of each occupation.[20]

This has led to the development of specific terms by the strength and conditioning community to characterize these populations. When they refer to **Tactical Populations**, they are referring to:

All professionals within the military, law enforcement and security, firefighting, and emergency response sectors.

When they talk about **Tactical Athletes**, they are referring to:

Chapter 6

All operators within tactical populations who require specialized physical training to enhance job performance, prevent injuries, and mitigate long-term health problems.

Based on years of knowledge, as we reviewed here, the application of exercise science to the tactical context has never been more accurate in preparing military personnel, law enforcement officers, firefighters, and other similar operators. However, there is still room for growth and a need to educate more people about this field.

Chapter 7

Shaping the Modern Era

Since the TSAC, almost 20 years have passed, and many things have changed, while some have remained the same. One of the most important changes is in society. According to the World Health Organization (WHO), 80% of adolescents do not meet the recommended levels of physical activity[6]. This represents a problem for recruitment in two ways: on one hand, the failure rate at the access physical assessments increases, and if this happens chronically, the pressure from the lack of people could lead to a decision to decrease the demands of the physical assessments. On the other hand, even those who pass the physical assessments could lack physical literacy, which could represent a lack of motor control. Both situations

[6] Consulted in 5 july 2024 in https://www.who.int/news-room/fact-sheets/detail/physical-activity#:~:text=31%25%20of%20adults%20and%2080,2030%2C%20from%20the%202010%20baseline.

promote injury risk and lead to the conclusion that physical literacy and motor control, which should be learned during adolescence, must be taught during the initial tactical physical training, leading to a longer learning curve.

Nowadays, in tactical physical training, it is common to find cardio training, weight training, calisthenics, circuit training, and high-intensity functional training in their programs. These methods can address gaps in fitness depending on the approach used. It is also important to understand that without a well-structured and planned program with regular practice for at least eight weeks, improvements may be compromised.[36]

One possible approach to tactical population physical training is the ExultX Progression Pyramid. The pyramid has four faces, and on each face, it proposes a logical progression for the main motor abilities. This approach takes into consideration the minimization of injury risk and ensures a solid progression to maximize long-term growth capabilities and health.

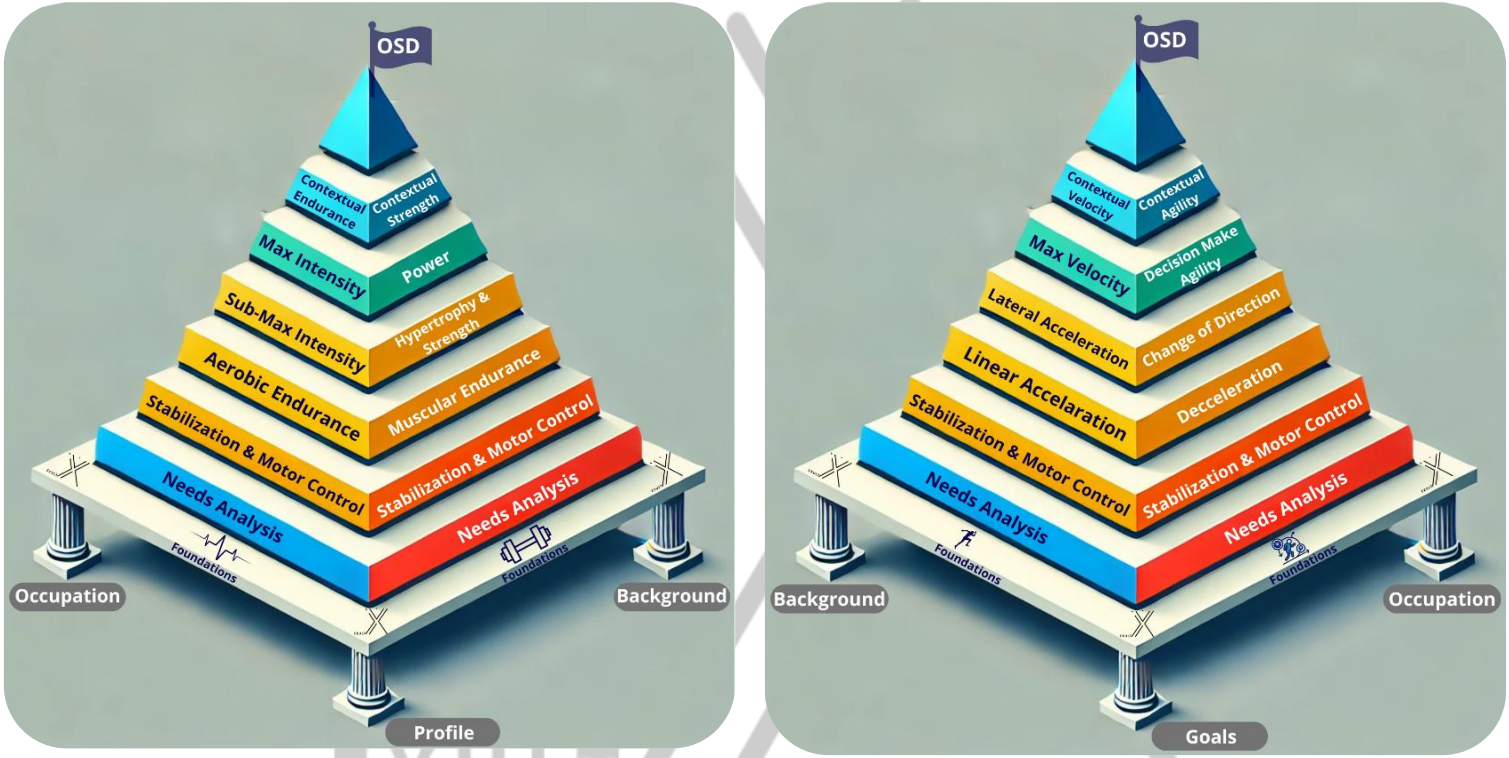


Illustration 4. ExultX Progression Pyramid.
OSD - Occupational Skill Development.

We will not delve much in our approach because this is not a core of this publication but as in many others, either in tactical populations or in sports, creating a physiological, biomechanical, and physical profile is fundamental and this is only possible with tests, assessments and screenings. According to Rasteiro and his colleagues[36], the most common assessments in tactical settings are:

- Muscular Strength: Maximal strength tests such as bench press, leg press, squat, hex-bar deadlift, handgrip strength, and lower-back and leg strength.
- Muscular Endurance: Tests such as push-ups, sit-ups, pull-ups, and plank time.
- Muscular Power: Tests including vertical jump, standing broad jump, and seated medicine-ball throw.
- Aerobic Capacity: Tests such as the 2.4-km run, 20-m shuttle run, and 12-min run/Cooper tests.
- Anaerobic Capacity: Wingate anaerobic or sprint tests.
- Agility: Tests like the T-test and shuttle run.
- Flexibility: Sit-and-reach test.

- Specific Professional Tests: Tasks such as victim drag/rescue, climbing rope, and others specific to the profession.

Besides this review, we know that in some tactical settings there is a biomechanical assessments or movements screening.[20] The concept is simple: in mitigation of injury, quality of movement is fundamental. This concept is the base of some methods such functional approach argued by Gary Gray, Mike Boyle and Mark Verstegen. Their approach has gained significant attention in recent years as a paradigm shift in the readiness of tactical populations. Unlike traditional training methods or fitness trends, a functional approach emphasizes movement patterns that aim to enhance the performance of real-life tasks while mitigating the risk of injury. The entire concept is based on the exercise science principle of specificity. In summary, unless you are a marathon runner or a weightlifter, you don't need to

train to run a marathon in 2 hours or to perform a 200kg snatch. Instead, you need to train specifically to be ready to perform your tasks efficiently with your full equipment while keeping yourself free of injuries.[37]

Regardless of the approach used, it is crucial that it aligns with the reality of the operators. What we mean is that the physical training must be aligned with the operational training and the operational commitment. For this to happen, lines of communication must be open between the strength and conditioning coach, tactical fitness instructor, chain of command, and medical team, if all these departments exist in the tactical setting.

While physical training and fitness have historically been crucial focuses for these populations, today the implementation of holistic health programs is also part of the training regimen. These programs are designed to optimize both the physical and non-physical performance of the operators by addressing multiple domains of

health, enhancing readiness, reducing injury rates, and improving rehabilitation outcomes.[7]

In the last decade, exercise science and sports medicine have played a significant role in revolutionizing the readiness of tactical populations. It is now achievable for every operator or tactical trainer to conduct a well-integrated specific and functional training program with a workload monitoring or real-time physiological monitoring during strenuous exercises. The application of injury mitigation protocols is also feasible, minimizing the risk of injuries. When injuries do occur, they can be treated with well-integrated rehabilitation protocols involving an interdisciplinary team, allowing a full return to duty with a reduced risk of re-injury.

But the future is here, bringing a huge array of opportunities within the tactical context.

[7] Consulted in 5 july of 2024 in https://api.army.mil/e2/c/downloads/2023/06/05/cd114d3b/23-06-784-holistic-health-and-fitness-handbook-jun-23-public-release-1.pdf.

AI and Machine Learning will be increasingly used to create highly personalized training regimens based on individual performance data, recovery metrics, and specific operational requirements. Genetic testing could be used to tailor training programs to an individual's genetic predispositions, optimizing performance and reducing injury risk. Advanced wearable devices will offer more precise and comprehensive monitoring of physiological parameters such as heart rate variability, hydration levels, and muscle fatigue. Smart clothing could provide continuous monitoring of vital signs and movement patterns without the need for separate devices. Integrating data from multiple sources (wearables, training logs, medical records) will provide deeper insights into performance trends and potential issues. This data could be used to predict and prevent injuries, optimize training loads, and improve overall performance.

Remote consultations with strength and conditioning coaches, nutritionists, and medical

professionals will become more common, allowing for real-time adjustments to training and recovery plans. Apps and platforms that integrate data from various sources to provide a holistic view of an operator's health and readiness are already a reality and will continue to grow. Virtual reality and training simulations will provide immersive training environments that simulate real-world scenarios, enhancing tactical decision-making skills and physical preparedness. Augmented reality can offer real-time feedback during training exercises, helping to correct form and technique instantly.

Cryotherapy, hyperbaric oxygen therapy, and other advanced recovery methods will become more accessible and tailored to the needs of tactical populations. Research into supplements that enhance recovery and performance will continue to grow, providing tactical athletes with more effective options. Training programs that focus on mental toughness, stress management, and cognitive function will be commonly integrated with physical training. Biofeedback

and neurofeedback will be used to monitor and improve brain function and stress responses, enhancing overall performance.

All these advancements, and more, will be the products of the past years' development and consolidation of exercise science applied to the tactical context. However, they will not substitute the tactical fitness instructor or the tactical strength and conditioning coach, but if well used, they can help them in the decision-making process and improve the efficiency of the training process.

Nonetheless, we still see a lack of awareness among some commanders, tactical trainers, and operators about what is currently happening and what could possibly happen in the coming years in this specialized area. They often prefer to stay in their comfort zone, using classical fitness training methods or civilian fitness trends, many times due to scepticism, contextual biases, or simply a lack of knowledge.

In this brief history of tactical populations' physical training, we can see that society has faced Technological, cultural, social, economic, political, and many other challenges throughout history. The tactical settings have accompanied these challenges and have always had to adapt to meet new necessities. We strongly believe that we are passing through a period of great challenges, both social and technological, and it is time for the physical preparation of tactical populations to adapt in order to improve readiness, reduce the risk of injuries, and guarantee the long-term health and well-being of our operators. This will contribute to the retention of operators, increase their efficiency in performing their duties, and simultaneously improve their quality of life and longevity. This is only possible with a good understanding of the context and the specificity of physical training. At the same time, it requires the employment of interdisciplinary teams both in research and in the physical preparation of these populations, setting aside ego and cultural biases.

NOTE: This eBook is a free edition. Any attempt to make a profit from it should be reported on our website: www.exultx.com.

Bibliography

1. Ferril A. The Origins of War: From the Stone Age to Alexander the Great. London: Thames & Hudson; 1985.

2. Hanson V. The Western Way of War: Infantry Battle in Classical Greece. California: University of California Press; 2009.

3. Cartledge P. Spartan Reflections. United Kigdom: University of California Press; 2003.

4. David CY. A Brief History of the Olympic Games. Malden: Blackwell Publishing; 2004.

5. Issurin V. New Horizons for the Methodology and Physiology of Training Periodization. Sport Med. 2010;40(3):189-206. doi:0112-1642/10/0003-0189/$49.95/0

6. East W. A Historical Review and Analysis of Army Physical Readiness Training and Assessment. Fort Leavenworth, Kansas: Combat Studies Institute Press; 2013. https://www.armyupress.army.mil/Portals/7/combat-studies-institute/csi-books/APRT_WhitfieldEast.pdf.

7. Goldsworthy A. The Complete Roman Army. United Kigdom: WW Norton; 2011.

Bibliography

8. Connolly P. Greece and Rome at War. Singapore: Greenhill Books; 1998.

9. Lorge P. Chinese Martial Arts From Antiquity to the Twenty-First Century. United Kigdom: Cambridge University Press; 2012.

10. Arya R. Dhanurveda: The Vedic Military Science. India: Indian Foundation for Vedic Science; 2015.

11. Howard M. War in European History. New York: Oxford University Press; 2009.

12. Nitobé I. Bushido: The Soul of Japan. London: Penguin Books; 2020.

13. King M. The Renaissance in Europe. United Kigdom: Laurence King Publishing; 2003.

14. Zivanovic N, Pavlovic P, Antala B, Babic KP. History of Physical Education in Europe. I. Leposavic: Federation Internationale D' Education Physique; 2015.

15. Mercuriale G, Pennuto C. The Art of Gymnastica. Florença: L.S. Olschki; 2008.

16. Muths G, Blake W. Gymnastics for Youth: Or a Practigal Guide to Healthful and Amusing Exersices for the Use of Schools.

Bibliography

An Essay toward the Necessary Improvement of Education, Chiefly as It Relates to the Body. London: J. Johnson; 1800.

17. Wilson P. Europe's Tragedy: A New History Of The Thirty Years War. London: Penguin Publisher; 2010.

18. Blaze E. Military Life Under Napoleon: The Memoirs of Captain Elzear Blaze. Military History Press; 2001.

19. Merriman J. A History of Modern Europe: From the French Revolution to the Present. 3rd. Vol. New York: W. W. Norton & Company; 2009.

20. National Strength and Conditioning Association. Essentials of Tactical Strength and Conditioning. (Alvar B, Sell K, Deuster P, eds.). Champaign: Human Kinetics; 2017.

21. Liang H-H. The Rise of Modern Police and the European State System from Metternich to the Second World War. Cambridge: Cambridge University Press; 1992.

22. Hébert G. Guide Pratique d'education Physique. 2nd ed. France: Vuibert et Nony; 1916.

23. Hébert G. Le Code de La Force. France: Vuibert; 1911.

24. Keegan J. The First World War. London: Vintage; 2000.

25. Beevor B. The Second World War. New York: Back Bay Books; 2013.

26. Knapik J, Reynolds K, Harman E. Soldier Load Carriage: Historical, Physiological, Biomechanical and Medical Aspects. Mil Med. 2004;169(January):45-56. doi:10.7205/MILMED.169.1.45

27. Westad O. The Cold War: A World History. New York: Basic Books; 2017.

28. Mangan JA. The European Sports History Review: Militarism, Sport, Europe (War without Weapons). 5th ed. London: Frank Cass; 2003.

29. Cooper K. Aerobics. New York: Bantam; 1968.

30. Bompa T, Buzzichelli C. Peridization: Theory and Methodology of Training. Sixth. Champaign: Human Kinetics; 2019.

31. Karpovich P. Physiology of Muscular Activity. Philadelphia: Saunders; 1971.

32. Issurin V. Block Periodization: Breakthrough in Sports Training. (Yessis M, ed.). Michigan: Ultimate Athlete Concepts; 2008.

Bibliography

33. Tabata I. Tabata Training: The Science and History of HIIT. Cambridge: Academic Press; 2022.

34. Wolfe A. Freedom's Laboratory: The Cold War Struggle for the Soul of Science. Baltimore: Johns Hopkins University Press; 2020.

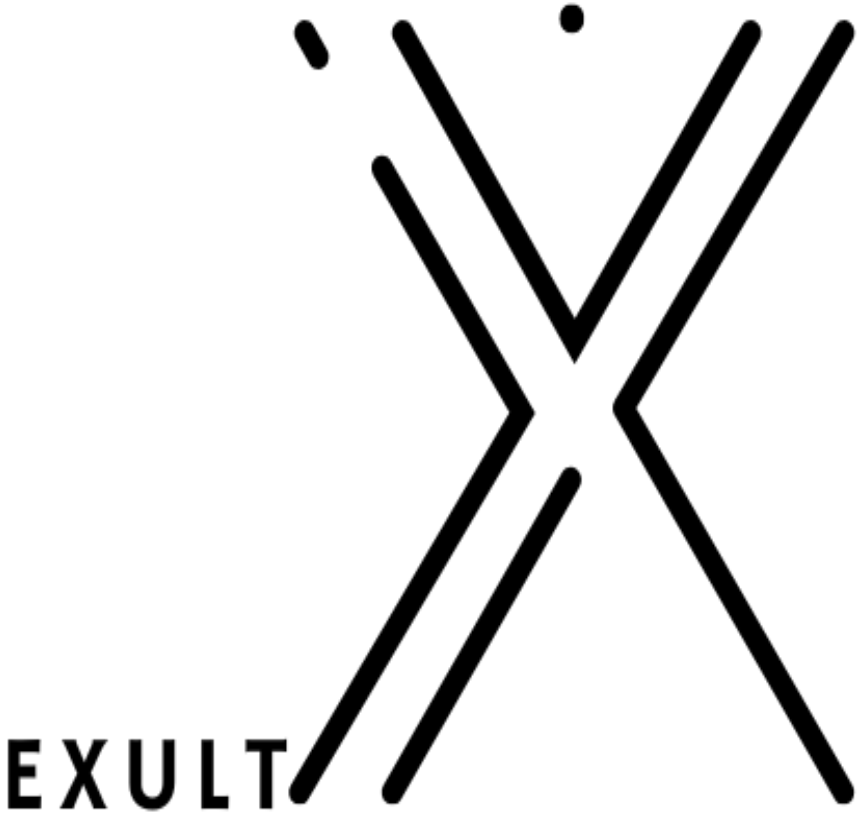
35. Gheciu A. Securing Civilization? The EU, NATO and the OSCE in the Post-9/11 World. Oxford: Oxford University Press; 2008.

36. Rasteiro A, Santos V, Massuça LM. Physical Training Programs for Tactical Populations: Brief Systematic Review. Healthcare. 2023;11(7). doi:10.3390/healthcare11070967

37. Boyle M. Advances in Funtional Strength. Santa Cruz: On Target Publications; 2010.

38. Stephen M. A History of the Sciences. New York: Collier Books; 1962.

39. Keele K. Leonardo da Vinci's influence on Renaissance anatomy. Med Hist. 1964;8(4):360-370. doi:10.1017/s0025727300029835



An ExultX Publication

An ExultX Publication